

414-A-2

2004-0031

960 Ocean Ave.

Dog Park

City of Portland

on spreadsheet

**CITY OF PORTLAND, MAINE  
DEVELOPMENT REVIEW APPLICATION  
PLANNING DEPARTMENT PROCESSING FORM  
Planning Copy**

2004-0031  
Application I. D. Number

**City Of Portland**  
Applicant  
**389 Congress St, Portland, ME 04101**  
Applicant's Mailing Address

**02/27/2004**  
Application Date

**Dog Park**  
Project Name/Description

Consultant/Agent  
**Applicant Ph: (207) 874-8793      Agent Fax:**  
Applicant or Agent Daytime Telephone, Fax

**960 - 960 Ocean Ave, Portland, Maine**  
Address of Proposed Site  
**414 A002001**  
Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply):  New Building  Building Addition  Change Of Use  Residential  Office  Retail  
 Manufacturing  Warehouse/Distribution  Parking Lot  Other (specify) **Dog Park**

Proposed Building square Feet or # of Units

Acreage of Site

**ROS**  
Zoning

**Check Review Required:**

- |  |   |  |  |
|--|---|--|--|
| <input checked="" type="checkbox"/> Site Plan<br>(major/minor) | <input type="checkbox"/> Subdivision<br># of lots | <input type="checkbox"/> PAD Review            | <input type="checkbox"/> 14-403 Streets Review   |
| <input type="checkbox"/> Flood Hazard                          | <input type="checkbox"/> Shoreland                | <input type="checkbox"/> Historic Preservation | <input type="checkbox"/> DEP Local Certification |
| <input type="checkbox"/> Zoning Conditional<br>Use (ZBA/PB)    | <input type="checkbox"/> Zoning Variance          |  | <input type="checkbox"/> Other                   |

Fees Paid:      Site Plan      \$400.00      Subdivision      Engineer Review      Date      **03/01/2004**

**Planning Approval Status:**

Reviewer      **Kandi Talbot**

- Approved       **Approved w/Conditions**  
See Attached       Denied

Approval Date      **04/07/2004**      Approval Expiration      **04/07/2005**      Extension to       Additional Sheets  
Attached

OK to Issue Building Permit      **Kandi Talbot**  
signature      date

**Performance Guarantee**       **Required\***       **Not Required**

\* No building permit may be issued until a performance guarantee has been submitted as indicated below

- |   |                |  |                 |
|---|----------------|--|-----------------|
| <input type="checkbox"/> Performance Guarantee Accepted     | date           | amount   | expiration date |
| <input type="checkbox"/> Inspection Fee Paid                | date           | amount   |                 |
| <input type="checkbox"/> Building Permit Issue              | date           |  |                 |
| <input type="checkbox"/> Performance Guarantee Reduced      | date           | remaining balance                                  | signature       |
| <input type="checkbox"/> Temporary Certificate of Occupancy | date           | <input type="checkbox"/> Conditions (See Attached) | expiration date |
| <input type="checkbox"/> Final Inspection                   | date           | signature  |                 |
| <input type="checkbox"/> Certificate Of Occupancy           | date           |  |                 |
| <input type="checkbox"/> Performance Guarantee Released     | date           | signature  |                 |
| <input type="checkbox"/> Defect Guarantee Submitted         | submitted date | amount   | expiration date |
| <input type="checkbox"/> Defect Guarantee Released          | date           | signature  |                 |



**CITY OF PORTLAND, MAINE  
DEVELOPMENT REVIEW APPLICATION  
PLANNING DEPARTMENT PROCESSING FORM  
ADDENDUM**

2004-0031  
Application I. D. Number

**City Of Portland**  
Applicant  
**389 Congress St, Portland, ME 04101**  
Applicant's Mailing Address

**02/27/2004**  
Application Date

**Dog Park**  
Project Name/Description

Consultant/Agent  
**Applicant Ph: (207) 874-8793      Agent Fax:**  
Applicant or Agent Daytime Telephone, Fax

**960 - 960 Ocean Ave, Portland, Maine**  
Address of Proposed Site  
**414 A002001**  
Assessor's Reference: Chart-Block-Lot

**Approval Conditions of Planning**

- 1 A sidewalk shall be installed along Ocean Avenue

**Approval Conditions of DRC**

- 1 a sidewalk shall be installed along Ocean Avenue.

**CITY OF PORTLAND, MAINE  
DEVELOPMENT REVIEW APPLICATION  
PLANNING DEPARTMENT PROCESSING FORM  
DRC Copy**

2004-0031  
Application I. D. Number

**City Of Portland**  
Applicant  
**389 Congress St, Portland, ME 04101**  
Applicant's Mailing Address

**02/27/2004**  
Application Date

**Dog Park**  
Project Name/Description

Consultant/Agent  
**Applicant Ph: (207) 874-8793      Agent Fax:**  
Applicant or Agent Daytime Telephone, Fax

**960 - 960 Ocean Ave, Portland, Maine**  
Address of Proposed Site  
**414 A002001**  
Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply):  New Building  Building Addition  Change Of Use  Residential  Office  Retail  
 Manufacturing  Warehouse/Distribution  Parking Lot  Other (specify) **Dog Park**

Proposed Building square Feet or # of Units

Acreage of Site

**ROS**  
Zoning

**Check Review Required:**

- |  |   |  |  |
|--|---|--|--|
| <input checked="" type="checkbox"/> Site Plan<br>(major/minor) | <input type="checkbox"/> Subdivision<br># of lots | <input type="checkbox"/> PAD Review            | <input type="checkbox"/> 14-403 Streets Review   |
| <input type="checkbox"/> Flood Hazard                          | <input type="checkbox"/> Shoreland                | <input type="checkbox"/> Historic Preservation | <input type="checkbox"/> DEP Local Certification |
| <input type="checkbox"/> Zoning Conditional<br>Use (ZBA/PB)    | <input type="checkbox"/> Zoning Variance          |  | <input type="checkbox"/> Other                   |

Fees Paid:      Site Plan      \$400.00      Subdivision      Engineer Review      Date      **03/01/2004**

**DRC Approval Status:**

Reviewer      **Kandi Talbot**

- Approved       **Approved w/Conditions**  
See Attached       Denied

Approval Date      **04/07/2004**      Approval Expiration      **04/07/2005**      Extension to       Additional Sheets  
Attached

Condition Compliance      **Kandi Talbot**  
signature      date

**Performance Guarantee**       **Required\***       **Not Required**

\* No building permit may be issued until a performance guarantee has been submitted as indicated below

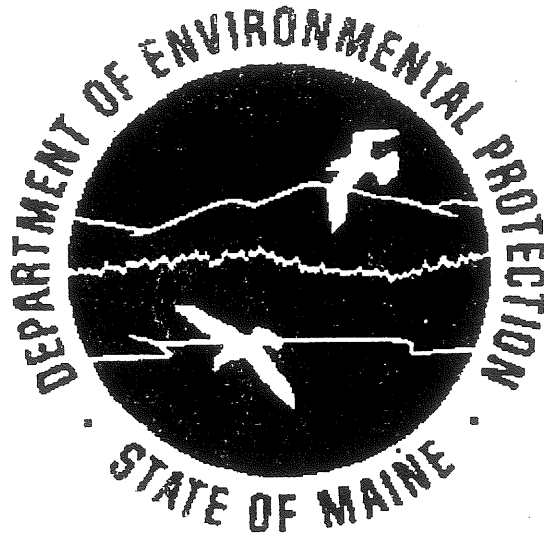
- |   |                |  |                 |
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DRAGON INDUSTRIAL ZONE

STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Article 8  
Performance Standards for Quarries  
38 M.R.S.A. §§ 490-W to 490-EE



Bureau of Land and Water Quality  
DEPLW96-1

JULY 4, 1996

ATTACHMENT 6

Ⓢ A

## PERFORMANCE STANDARDS FOR QUARRIES

38 MRSA §§490-W TO 490-EE

### *Notes Concerning the Text July 4, 1996*

*The following text of Article 8 (Performance Standards for Quarries) includes amendments made by the One Hundredth and Seventeenth Legislature, Second Regular Session. The table of contents and footnotes have been added to this document by the Department of Environmental Protection and are not part of the statutory text.*

*All copyrights and other rights to statutory text are reserved by the State of Maine. The text included in this publication is current to the end of the Second Regular Session of the 117th Legislature but is subject to change without notice. It is a version that is presumed accurate but which has not been officially certified by the Secretary of State. Refer to the Maine Revised Statutes Annotated and supplements for certified text.*

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**ARTICLE 8-A**  
**PERFORMANCE STANDARDS FOR QUARRIES**

**§490-W. Definitions**

As used in this article, unless the context otherwise indicates, the following terms have the following meanings.

1. **Affected land.** "Affected land" means all reclaimed and unreclaimed land, land that has or will have the overburden removed, land on which stumps, spoil or other solid waste has or will be deposited and storage areas or other land, except natural buffer strips, that will be or has been used in connection with a quarry.

2. **Airblast.** "Airblast" means an atmospheric compression wave resulting from the detonation of explosives, whether resulting from the motion of blasted materials or the expansion of gases from the explosion.

3. **Blaster.** "Blaster" means a person qualified to be in charge of or responsible for the loading and firing of a blast.

✓ 4. **Blasting.** "Blasting" means the use of explosives to break up or otherwise aid in the extraction or removal of a rock or other consolidated natural formation.

✓ 5. **Blast site.** "Blast site" means the area where explosive material is handled during the loading of drilled blastholes, including the perimeter formed by the loaded blastholes and 50 feet in all directions from loaded blastholes.

6. **Detonating cord.** "Detonating cord" means a flexible cord containing a center core of high explosives that may be used to initiate other explosives.

7. **Explosive.** "Explosive" means any chemical compound or other chemical substance that contains oxidizing or combustible materials used for the purpose of producing an explosion intended to break or move rock, earth or other materials.

8. **Flyrock.** "Flyrock" means rock that is propelled through the air or across the ground as a result of blasting and that leaves the blast area.

9. **Matting.** "Matting" means a covering placed over load holes and adjacent areas in order to minimize generation of flyrock and limit airblast effects.

✓ 10. **Natural buffer strip.** "Natural buffer strip" means an undisturbed area or belt of land that is covered with trees or other vegetation.

**11. Passenger car equivalents at peak hour.** "Passenger car equivalents at peak hour" means the number of passenger cars, or, in the case of nonpassenger vehicles, the number of passenger cars that would be displaced by nonpassenger vehicles, that pass through an intersection or on a roadway under prevailing roadway and traffic conditions at that hour of the day during which traffic volume generated by the development is higher than the volume during any other hour of the day. For purpose of this article, one tractor-trailer combination is the equivalent of 2 passenger cars.

**12. Peak particle velocity.** "Peak partichel velocity" means the maximum rate of ground movement measured by any of the 3 mutually perpendicular components of ground motion.

**13. Preblast survey.** "Preblast survey" means documentation, prior to the initiation of blasting, of the condition of buildings, structures, wells or other infrastructures; protected natural resources; historic sites; and unusual natural areas.

**14. Private drinking water supply.** "Private drinking water supply" means a surface water supply, a dug well, a spring or a hole drilled, driven or bored into the earth that is used to extract drinking water for human consumption and that is not part of a public drinking water supply.

**15. Production blasting.** "Production blasting" means blasting conducted for the purpose of extracting or removing natural materials for commercial sale or beneficiation.

**16. Public drinking water source.** "Public drinking water source " means a groundwater well or a surface water source that directly or indirectly serves a water distribution system that has at least 15 service connections or regularly services an average of at least 25 individuals daily at least 60 days of the year.

✓ **17. Quarry.** "Quarry" means a place where rock is excavated.

**18. Reclamation.** "Reclamation" means the rehabilitation of the area of land affected by mining, including, but not limited to, the stabilization of slopes and creation of safety benches, the planting of forests, the seeding of grasses and legumes for grazing purposes, the planting of crops for harvest and the enhancement of wildlife and aquatic habitat and aquatic resources. "Reclamation" does not include the filling in of pits and the filling or sealing of shafts and underground workings with solid materials unless necessary for the protection of groundwater or for reasons of safety.

**19. Regulator.** "Regulator" means:

A. For a quarry located wholly within a municipality that is registered under section 490-DD to enforce this article, the municipality; and

B. For all other quarries, the Department of Environmental Protection.

20. **Rock.** "Rock" means a hard, nonmetallic material that requires cutting, blasting or similar methods of forced extraction.

21. **Stemming.** "Stemming" means inert material used in a blasthole to confine the gaseous products of detonation.

22. **Surface blasting.** "Surface blasting" means any blasting for which the blast area lies at the surface of the ground.

23. **Underground production blasting.** "Underground production blasting" means a blasting operation carried out beneath the surface of the ground by means of shafts, declines, adits or other openings leading to the natural material being mined or extracted.

#### §490-X. **Applicability**

This article applies to any quarry that is more than one acre in size, including reclaimed and unreclaimed areas, or at which underground production blasting is proposed.

The article does not apply to a quarry located wholly within the jurisdiction of the Maine Land Use Regulation Commission.

This article does not apply to an excavation or grading preliminary to a construction project, unless intended to circumvent this article.

A person with a valid permit for a quarry under article 6 must operate that quarry in compliance with the terms and conditions of that permit. Any modification of the permit must be in conformance with section 484. A person with a permit under article 6 may file a notice of intent to comply with this article. The permit issued under article 6 lapses as of the date a complete notice of intent is filed with the department. If the permittee chooses to substitute a notification pursuant to this article, all terms and conditions that applied to the permit issued pursuant to article 6 are incorporated into the notification approved pursuant to this article.

#### §490-Y. **Notice of intent to comply**

Except as provided in section 484-A, a person intending to create or operate a quarry under this article must file a notice of intent to comply before the total area of excavation of rock or overburden on the parcel exceeds one acre. Both reclaimed and unreclaimed areas are added together in determining whether this one-acre threshold is exceeded. A notice filed under this section must be complete, submitted on forms approved by the department and mailed to the municipality where the quarry is located, the department, the Maine Historic Preservation Commission and each abutting property owner. The notice that is mailed to the department must be sent by certified mail, return receipt requested. Upon receiving the postal receipt, the owner or operator may commence operation of the quarry.

A notice of intent to comply is not complete unless it includes the following:



1. **Name, address and telephone number.** The name, mailing address and telephone number of the owner of the quarry and, if different from the owner, the operator of the quarry;

2. **Map and site plan.** A location map and site plan drawn to scale showing property boundaries, stockpile areas, existing reclaimed and unreclaimed lands, proposed maximum acreage of all affected lands, all applicable private drinking water supplies or public drinking water sources and all existing or proposed solid waste disposal areas;

3. **Parcel description.** A description of the parcel including size and deed description;

4. **Legal interest.** A copy of the lease or other document showing that an operator who is not the owner has a legal right to excavate on the property. Stumpage information does not have to be shown;

5. **Information on abutters.** The names and addresses of abutting property owners;

6. **Signed statement.** A statement signed and dated by the owner or operator certifying that the quarry will be operated in compliance with this article; and

7. **Fees.** A fee paid to the department as provided by section 490-EE.

If the department determines that a notice filed under this section is not complete, the department must notify the owner or operator no later than 45 days after receiving the notice.

#### §490-Z. Performance standards for quarries

1. **Significant wildlife habitat.** Affected land may not be located in a significant wildlife habitat as defined in section 480-B, subsection 10 or in an area listed pursuant to the Natural Areas Program, Title 5, section 13076. The department may not grant a variance from the provisions of this subsection.

2. **Solid waste.** Solid waste, including stumps, wood waste and land-clearing debris generated on the affected land must be disposed of in accordance with chapter 13, including any rules adopted to implement those laws. The department may not grant a variance from the provisions of this subsection.

3. **Groundwater protection.** To ensure adequate groundwater protection, the following setback requirements must be met.

A. A 200-foot separation must be maintained between an excavation and a private drinking water supply that is point driven or dug and was in existence prior to the excavation.

B. A 100-foot separation must be maintained between an excavation and a private drinking water supply that is drilled into saturated bedrock and was in existence prior to the excavation.

C. Separation must be maintained between an excavation and a public drinking water source as follows:

(1) For systems serving a population of 500 persons or less, the minimum separation must be 300 feet;

(2) For systems serving a population of 501 persons up to 1,000 persons, the separation must be 500 feet;

(3) For systems serving a population of more than 1,000 persons, the separation must be 1,000 feet; and

(4) For any system that holds a valid filtration waiver in accordance with the federal Safe Drinking Water Act, 42 United States Code, Sections 300f to 300j-26 (1988), the separation must be 1,000 feet.

D. Refueling operations, oil changes, other maintenance activities requiring the handling of fuels, petroleum products and hydraulic fluids and other on-site activity involving storage or use of products that, if spilled, may contaminate groundwater, must be conducted in accordance with the department's spill prevention, control and countermeasures plan. Petroleum products and other substances that may contaminate groundwater must be stored and handled over impervious surfaces that are designed to contain spills. The spill prevention, control and countermeasures plan must be posted at the site.

E. In the event of excavation below the seasonal high water table, a 300-foot separation must be maintained between the limit of excavation and any predevelopment private drinking water supply and a 1000-foot separation must be maintained between the limit of excavation and any public drinking water source or area previously designated for potential use as a public drinking water source by a municipality or private water company.

The department may grant a variance from the provisions of paragraph C upon consultation with the persons or entity that controls the public drinking water supply affected by the excavation. The department may not grant a waiver from the provisions of paragraph A, B or D.

Excavation below the seasonal highwater table of an area previously designated for potential use as a public drinking water source by a municipality or private water company is prohibited. The department may grant a variance allowing excavation below the seasonal highwater table if the applicant demonstrates that the yield of groundwater flow to protected waters or wetlands or public drinking water sources or private drinking water supplies will not be adversely affected by the excavation.

In the event of excavation below the seasonal highwater table, the operator of a mining activity that affects by excavation activities a public drinking water source or private drinking water supply by contamination, interruption or diminution must restore or replace the affected water supply with an alternate source of water, adequate in quantity and quality for the purpose served by the supply. This provision is not intended to replace any independent action that a person may have whose water supply is affected by a mining activity.

**4. Natural buffer strip.** Existing vegetation within a natural buffer strip may not be removed. If vegetation within the natural buffer strip has been removed or disturbed by the excavation or activities related to operation of a quarry before submission of a notice of intent to comply, that vegetation must be reestablished as soon as practicable after filing the notice of intent to comply. The department may not grant a variance from the provisions of this subsection.

**5. Protected natural resources.** A natural buffer strip must be maintained between the working edge of an excavation and a river, stream, brook, great pond or coastal wetland as defined in section 480-B. A natural buffer strip must also be maintained between the working edge of an excavation and certain freshwater wetlands as defined in section 480-B and having the characteristics listed in paragraph B. Excavation activities conducted within 100 feet of a protected natural resource must comply with the applicable permit requirements under article 5-A. The width requirements for natural buffer strips are as follows.

A. A natural buffer strip at least 100 feet wide must be maintained between the working edge of the excavation and the normal high water line of a great pond classified as GPA or a river flowing to a great pond classified as GPA.

B. A natural buffer strip at least 75 feet wide must be maintained between the working edge of the excavation and a body of water other than as described in paragraph A, a river, stream or brook, coastal wetland or significant wildlife habitat contained within a freshwater wetland consisting of or containing:

(1) Under normal circumstances, at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation or open water, except for artificial ponds or impoundments; or

(2) Peat lands dominated by shrubs, sedges and sphagnum moss.

For purposes of this subsection, the width of a natural buffer strip is measured from the upland edge of a floodplain wetland. If no floodplain wetlands are present, the width is measured from the normal high water mark of the river, stream or brook. The width is measured from the normal high water mark of a great pond and upland edge of a freshwater or coastal wetland.

The department may not grant a variance from this subsection.

**6. Roads.** A natural buffer strip must be maintained between the working edge of an excavation and a road as follows.

A. A natural buffer strip at least 150 feet wide must be maintained between the working edge of an excavation and a road designated as a scenic highway by the Department of Transportation.

B. A natural buffer strip at least 100 feet wide must be maintained between the working edge of the excavation and any other public road.

C. A natural buffer strip at least 50 feet wide must be maintained between the working edge of an excavation and a private road or a right-of-way. If a private road is contained within a wider right-of-way, the buffer is measured from the edge of the right-of-way. The width of the natural buffer strip adjacent to a private road may be reduced if the applicant receives written permission from the persons having a right-of-way over the private road.

The department may not grant a variance from the provisions of paragraph A or C. The department may grant a variance from paragraph B if the variance does not result in the natural buffer strip being reduced to less than 50 feet between the working edge of the excavation and any road and if the owner or operator installs visual screening and safety measures as required by the department.

A distance specified in this subsection is measured from the outside edge of the shoulder of the road unless otherwise specifically provided.

**7. Property boundary.** A natural buffer strip at least 100 feet wide must be maintained between an excavation and any property boundary. This distance may be reduced to 10 feet with the written permission of the affected abutting property owner or owners, except that the distance may not be reduced to less than 25 feet from the boundary of a cemetery or burial ground. The natural buffer strip between quarries owned by abutting owners may be eliminated with the abutter's written permission if the elimination of this natural buffer strip does not increase the runoff from either excavation across the property boundary. All property boundaries must be identified in the field by markings such as metal posts, stakes, flagging or blazed trees. The department may not grant a variance from the provisions of this subsection.

**8. Erosion and sedimentation control.** All reclaimed and unreclaimed areas, except for access roads, must be naturally internally drained at all times unless a variance is obtained from the department. Stockpiles consisting of topsoil to be used for reclamation must be seeded, mulched or otherwise temporarily stabilized.

A. Sediment may not leave the parcel or enter a protected natural resource.

B. Grubbed areas not internally drained must be stabilized.

C. Erosion and sedimentation control for access roads must be conducted in accordance with the department's best management practices for erosion and sedimentation control.

The department may not grant a variance from the provisions of paragraph A, B or C.

**9. Surface water protection and storm water management.** Surface water discharges from areas not required to be naturally internally drained may not be increased as a result of storm water runoff from storms up to a level of a 25-year, 24-hour storm. Accumulated water from precipitation must be put into sheet flow and the discharge point must be directed to an undisturbed natural buffer strip. The discharge point must be at least 250 feet away from a protected natural resource. The slope of the discharge area may not exceed 5%.

Grading or other construction activity on the site may not alter natural drainageways so that the drainage, other than that which occurred before development, adversely affects an adjacent parcel of land or so that the drainageways flowing from an adjacent parcel of land to the parcel are impeded.

Structures such as detention ponds, retention ponds and undersized culverts may not be used to meet the standard in this subsection unless a variance is obtained from the department.

**10. Traffic.** The following provisions govern traffic.

A. Entrances and exits of the quarry must be located, posted and constructed in accordance with standards for roadways in rules adopted by the board. Adequate distances for entering, exiting and stopping must be maintained in accordance with these standards. The department may not grant a variance from the provisions of this subsection. This paragraph is repealed July 1, 1997.

B. Any excavation activity that generates 100 or more passenger car equivalents at peak hour must comply with the applicable permit requirements under article 6. This paragraph takes effect July 1, 1997.

**11. Noise.** Noise levels may not exceed applicable noise limits in rules adopted by the board.

**12. Dust.** Dust generated by activities at a quarry, including dust associated with traffic to and from a quarry, must be controlled by sweeping, paving, watering or other best management practices for control of fugitive emissions. Dust control methods may include calcium chloride as long as the manufacturer's labeling guidelines are followed. The department may not grant a variance from the provisions of this subsection.

**13. Reclamation.** The affected land must be restored to a condition that is similar to or compatible with the conditions that existed before excavation. Reclamation may be conducted in accordance with the department's best management practices for erosion and sedimentation control and must include the following.

A. Highwalls, or quarry faces, must be treated in such a manner as to leave them in a condition that minimizes the possibility of rock falls, slope failures and collapse. A highwall that is loose must be controlled by the use of blasting or scaling, the use of safety benches, the

see  
Article 10  
No DEP  
Site Act  
Regs.

use of flatter slopes or reduced face heights or the use of benching near the top of the face or rounding the edge of the face.

B. A vegetative cover must be established by seeding or planting within one year of the completion of excavation. Vegetative cover must be established on all affected land, including safety benches, except for quarry walls and flooded areas. Topsoil must be placed, seeded and mulched within 30 days of final grading. Vegetative cover is acceptable if within one year of seeding:

(1) The planting of trees and shrubs results in a permanent stand or a stand capable of regeneration and succession sufficient to ensure a 75% survival rate; and

(2) The planting of all material results in permanent 90% ground cover.

Vegetative cover used in reclamation must consist of grasses, legumes, herbaceous or woody plants, shrubs, trees or a mixture of these.

C. All structures, once no longer in use, and all access roads, haul roads and other support roads must be reclaimed.

D. All affected lands must be reclaimed within 2 years after final grading.

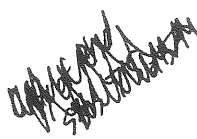
E. Topsoil that is stripped or removed must be stockpiled for use in reclaiming disturbed land areas. The department may grant a variance from this paragraph if the applicant demonstrates that the soil is not needed for reclamation purposes.

F. The department may require a bond payable to the State with sureties satisfactory to the department or such other security as the department determines adequately secures compliance with this article, conditioned upon the faithful performance of the requirements set forth in this article. Other security may include a security deposit with the State, an escrow account and agreement, insurance or an irrevocable trust. In determining the amount of the bond or the security, the department shall take into consideration the character and nature of the overburden, the future suitable use of the land involved and the cost of grading and reclamation required. All proceeds of forfeited bonds or other security must be expended by the department for the reclamation of the area for which the bond was posted and any remainder returned to the operator.

G. The board may adopt or amend rules to carry out this subsection, including rules relating to operational or maintenance plans; standards for determining the reclamation period; annual revisions of those plans; limits, terms and conditions on bonds or other security; proof of financial responsibility of a person engaged in excavation activity or the affiliated person who guarantees performance; estimation of reclamation costs; reports on reclamation activities; and the manner of determining when the bond or other security may be discharged.

**14. Blasting.** The applicant must ensure that the blasting is conducted in accordance with Title 25, section 2441.

A. The owner or operator shall use sufficient stemming, matting or natural protective cover to prevent flyrock from leaving property owned or under control of the owner or operator or from entering protected natural resources or natural buffer strips. Crushed rock or other suitable material must be used for stemming when available; native gravel, drill cuttings or other material may be used for stemming only if no other suitable material is available.

 B. The maximum allowable airblast at any inhabited building not owned or controlled by the developer may not exceed 129 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz.

C. The maximum allowable airblast at an uninhabited building not owned or controlled by the developer may not exceed 140 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz.

D. Monitoring of airblast levels is required in all cases for which a preblast survey is required by paragraph F. The department may waive the monitoring requirement if the owner or operator secures the permission of affected property owners to increase allowable airblast levels on their property and the department determines that no protected natural resource will be adversely affected by the increased airblast levels.

E. If a blast is to be initiated by detonating cord, the detonating cord must be covered by crushed rock or other suitable cover to reduce noise and concussion effects.

F. A preblast survey is required for all production blasting and must extend a minimum radius of 2000 feet from the blast site. The preblast survey must document any preexisting damage to structures and buildings and any other physical features within the survey radius that could reasonably be affected by blasting. Assessment of features such as pipes, cables, transmission lines and wells and other water supply systems must be limited to surface conditions and other readily available data, such as well yield and water quality. The preblast survey must be conducted prior to the initiation of blasting at the operation. The owner or operator shall retain a copy of all preblast surveys for at least one year from the date of the last blast on the development site.

(1) The owner or operator is not required to conduct a preblast survey if the department determines that no protected natural resource within the limits of the otherwise required survey is likely to be affected by blasting and production blasting will not occur within 2000 feet of any building not owned or under the control of the developer.

(2) The owner or operator is not required to conduct a preblast survey on properties for which the owner or operator documents the rejection of an offer by registered letter, return receipt requested, to conduct a preblast survey. Any person owning a building within a preblast survey radius may voluntarily waive the right to a survey.

(3) The owner or operator is not required to conduct a preblast survey if the owner or operator agrees to design all blasts so that the weight of explosives per eight millisecond or greater delay does not exceed that determined by the equation  $W=(D/D_s)^2$ , where W is the maximum allowable weight of explosives per delay of 8 milliseconds or greater, D is the shortest distance between any area to be blasted and any inhabitable structure not owned or controlled by the developer and  $D_s$  equals 70 ft./ $(lb.)^{1/2}$ .

G. Blasting may not occur in the period between sundown and sunrise the following day or in the period 7:00 p.m. and 7:00 a.m., whichever is greater. Routine production blasting is not allowed in the daytime on Sunday. Detonation of misfires may occur outside of these times but must be reported to the department within 5 business days of the misfire detonation. Blasting may not occur more frequently than 4 times per day. Underground production blasting may be exempted from these requirements provided that a waiver is granted by the department.

H. Sound from blasting may not exceed the following limits at any protected location:

Number of Blast Per Day	Sound Level Limit
1	129 dbl
2	126 dbl
3	124 dbl
4	123 dbl

I. The maximum peak particle velocity at inhabitable structures not owned or controlled by the developer may not exceed the levels established in Table 1 in paragraph K and the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1. The department may grant a variance to allow ground vibration levels greater than 2 inches per second on undeveloped property not owned or controlled by the applicant if the department determines that no protected natural resource, unusual natural area or historic site will be adversely affected by the increased ground vibration levels. If inhabitable structures are constructed on the property after approval of the development and prior to completion of blasting, the developer immediately must notify the department and modify blasting procedures to remain in compliance with the standards of this subsection.

J. Based upon an approved engineering study, the department may grant a variance to allow higher vibration levels for certain buildings and infrastructures. In reviewing a variance application, the department shall take into account that the standards in this paragraph and paragraph I are designed to protect conventional low-rise structures such as churches, homes and schools. In cases of practical difficulty, the department may grant a variance from paragraph I if it can be demonstrated that no adverse impacts on existing infrastructures or protected natural resources, unusual natural areas or historic sites will result.



K. Table 1 of this paragraph or the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 must be used to evaluate ground vibration effects for those blasts for which a preblast survey is required.

- (1) Either Table 1 of this paragraph or graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 may be used to evaluate ground vibration effects when blasting is to be monitored by seismic instrumentation.
- (2) Blasting measured in accordance with Table 1 of this paragraph must be conducted so that the peak particle velocity of any one of the 3 mutually perpendicular components of motion does not exceed the ground vibration limits at the distances specified in Table 1 of this paragraph.
- (3) Seismic instruments that monitor blasting in accordance with Table 1 of this paragraph must have the instrument's transducer firmly coupled to the ground.
- (4) An owner or operator using Table 1 of this paragraph must use the scaled-distance equation,  $W=(D/D_s)^2$ , to determine the allowable charge weight of explosives to be detonated in any 8 millisecond or greater delay period without seismic monitoring, where  $W$  is equal to the maximum weight of explosives, in pounds, and  $D$  and  $D_s$  are defined as in Table 1 of this paragraph. The department may authorize use of a modified scaled-distance factor for production blasting if the owner or operator can demonstrate to a 95% confidence level, based upon records of seismographic monitoring at the specific site of the mining activity covered by the permit, that use of the modified scaled-distance factor will not cause the ground vibration to exceed the maximum allowable peak particle velocities of Table 1 of this paragraph.
- (5) Blasting monitored in accordance with the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 must be conducted so that the continuously variable particle velocity criteria are not exceeded.

The owner or operator may apply for a variance of the ground vibration monitoring requirement prior to conducting blasting at the development site if the owner or operator agrees to design all blasts so that the weight of explosives per 8 millisecond or greater delay does not exceed that determined by the equation  $W=(D/D_s)^2$ , where  $W$  is the maximum allowable weight of explosives per delay of 8 milliseconds or greater,  $D$  is the shortest distance between any area to be blasted and any inhabitable structure not owned or controlled by the developer and  $D_s$  equals 70 ft./lb.<sup>1/2</sup>. As a condition of the variance, the department may require submission of records certified as accurate by the blaster and may require the owner or operator to document compliance with the conditions of this paragraph.

The following is Table 1.

Distance versus Peak Particle Velocity Method

Distance (D) from the blast area (feet)	Maximum allowable peak particle velocity (Vmax) for ground vibration (in./sec.)	Scaled-distance factor (Ds) to be applied without seismic monitoring
0 to 300	1.25	50
301-5000	1.00	55
Greater than 5000	0.75	65

L. A record of each blast, including seismographic data, must be kept for at least one year from the date of the last blast, must be available for inspection at the development or at the offices of the owner or operator if the development has been closed, completed or abandoned before the one-year limit has passed and must contain at a minimum the following data:

- (1) Name of blasting company or blasting contractor;
- (2) Location, date and time of blast;
- (3) Name, signature and social security number of blaster;
- (4) Type of material blasted;
- (5) Number and spacing of holes and depth of burden or stemming;
- (6) Diameter and depth of holes;
- (7) Type of explosives used;
- (8) Total amount of explosives used;
- (9) Maximum amount of explosives used per delay period of 8 milliseconds or greater;
- (10) Maximum number of holes per delay period of 8 milliseconds or greater;
- (11) Method of firing and type of circuit;

- (12) Direction and distance in feet to the nearest dwelling, public building, school, church or commercial or institutional building neither owned nor controlled by the developer;
- (13) Weather conditions, including such factors as wind direction and cloud cover;
- (14) Height or length of stemming;
- (15) Amount of mats or other protection used;
- (16) Type of detonators used and delay periods used;
- (17) The exact location of each seismograph and the distance of each seismograph from the blast;
- (18) Seismographic readings;
- (19) Name and signature of the person operating each seismograph; and
- (20) Names of the person and the firm analyzing the seismographic data.

M. All field seismographs must record the full analog wave form of each of the 3 mutually perpendicular components of motion in terms of particle velocity. All seismographs must be capable of sensor check and must be calibrated according to the manufacturer's recommendations.

#### **§490-AA. Inspections**

The department may periodically inspect a site, examine relevant records of the owner or operator of a quarry, take samples and perform tests necessary to determine compliance with the provisions of this article.

#### **§490-BB. Enforcement and penalties**

The department shall administer and enforce the provisions of this article.

**1. Stop-work order.** The department may order the owner or operator of a quarry that is not operating in compliance with this article to cease operations until the noncompliance is corrected.

**2. Penalty.** A person who violates a provision of this article commits a civil violation and is subject to the penalties established under section 349. Penalties assessed for enforcement actions taken by the State are payable to the State.

**3. Reclamation.** If, after an opportunity for a hearing, the commissioner determines that the owner of an excavation site or the person who was engaged in the excavation activity at the excavation site has violated this article, the commissioner shall direct the department staff or contractors under the supervision of the commissioner to enter on the property and carry out the necessary reclamation. The person engaged in mining or any affiliated person who guarantees performance at the excavation site is liable for the reasonable expenses of this necessary reclamation. The commissioner may use the bond or other security paid under section 490-Z, subsection 13, paragraph F to meet the reasonable expenses of reclamation.

#### **§490-CC. Variances**

An owner or operator must comply with the performance standards in section 490-Z unless a variance from those performance standards is approved by the department. Except when prohibited by section 490-Z, the department may grant a variance from the performance standards in this article if the owner or operator affirmatively demonstrates to the department that the variance does not adversely affect natural resources or existing uses and does not adversely affect the health, safety and general welfare of the public. A variance application must include any fee applicable under section 490-EE. The department shall process the variance application according to chapter 2 and the rules adopted by the department for processing an application. An applicant for a variance under this article shall hold a public informational meeting as described in those rules.

The department shall publish a timetable for responding to variance applications in the same manner prescribed in section 344-B. A variance is not valid unless approved by the department and, if a municipality is the regulator, the municipality. In making its decision on a variance application, the department shall consider comments or information received and the compliance record of the owner or operator. The department shall inform the owner or operator of any significant concerns or issues raised.

#### **§ 490-DD. Municipal enforcement; registration**

A municipality may register for authority to enforce this article by adopting and submitting to the commissioner an ordinance that meets or exceeds the provisions of this article. The commissioner shall review that ordinance to determine whether that ordinance meets the provisions of this article and if the municipality has adequate resources to enforce the provisions of this article. If the commissioner determines that the ordinance meets the provisions of this article and that the municipality has the resources to enforce this article, the commissioner shall register that municipality for authority to enforce this article. Immediately upon approval by the commissioner, primary enforcement authority for this article vests in that municipality. The commissioner may not approve an ordinance under this section unless the ordinance requires that any request for a variance from the standards in the article be approved by the commissioner before the variance is valid.

**1. Relation to home rule.** This section may not be construed to limit a municipality's authority under home rule to adopt ordinances regulating quarries.

2. **Optional participation.** This article may not be construed to require a municipality to adopt any ordinance.<sup>1</sup>

3. **Suspension of approval.** The commissioner may act to enforce any provision of this article or suspend the registration of a municipality if the commissioner determines that a municipal ordinance no longer conforms to the provisions of this article or that the municipality is not adequately enforcing this article. The commissioner shall notify a municipality of any such determination in writing. Suspension of municipal registration by the commissioner does not void or in any way affect a municipal ordinance or in any way limit the municipality's authority to enforce the provisions of its ordinance.

4. **Appeal.** A municipality may appeal to the board any decision of the commissioner under this section. Any decision by the board on appeal by a municipality constitutes final agency action.

#### **§ 490-EE. Transfer of ownership or operation, review before expansion; fees**

1. **Review before expansion.** Before expanding a quarry beyond an area that exceeds a total of 10 acres of reclaimed and unreclaimed land and before each additional 10-acre expansion, the owner or operator shall notify the regulator of the owner's or operator's intent to expand and must request an inspection. In the same manner as prescribed in section 344-B, the department shall publish a timetable for responding to inspection requests and shall inspect the site within that time period to determine the quarry's compliance with this article and other applicable laws administered by the department. The department may defer an inspection for a reasonable period when winter conditions at the site prevent the department from evaluating an expansion request. The department shall notify the owner or operator of a deferral under this section. Excavation activities may continue after the filing of a notice of an intent to expand. The failure of a regulator to conduct a site visit within a published time period is not a sufficient basis for a stop-work order under section 490-BB, subsection 1.

At the time of filing a notification of intent to expand, the owner or operator shall pay any fee required by this section.

2. **Transfer of ownership or operation.** A person who purchases a quarry that is operated under a notice of intent to comply, as established under section 490-Y, or who obtains operating authority of a quarry that operates under a notice of intent to comply must file within 2 weeks after the purchase or the obtaining of operating authority a notice of intent to comply on a form developed by the department. The new owner or operator may operate the quarry during this 2-week period without having filed a notice of intent to comply if the new owner or operator complies with all standards of this article.

3. **Fees.** The owner or operator a quarry shall pay the regulator:

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- A. An initial fee of \$250 upon filing a notice of intent to comply under section 490-Y;
- B. By March 1st of each year, an annual fee of:
  - (1) Three hundred fifty dollars for an excavation from which 2,500 cubic yards or more of material will be extracted during that year; and
  - (2) Fifty dollars for all other excavations. To be eligible for the annual fee under this paragraph, the owner or operator must include with the payment of this fee a signed statement certifying that less than 2,500 cubic yards of material will be extracted during that year;
- C. A fee of \$250 for each variance requested under section 490-CC, except for the following:
  - (1) A fee of \$500 for a variance to excavate below the seasonal high water table;
  - (2) A fee of \$500 for a variance to create an externally drained quarry;
  - (3) A fee of \$125, for a variance to waive the topsoil salvage requirement;
  - (4) A fee of \$125 for a variance to waive the monitoring requirements for airblasts and ground vibration; and
  - (5) A fee of \$250 upon filing a notice of intent to expand under section 490-EE; and<sup>1</sup>.
- D. A fee of \$250 upon filing a notice of intent to expand under this section.

Notwithstanding any other provision of this subsection, the total for all fees paid under paragraphs A and B for one quarry in one calendar year may not exceed \$350.

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<sup>1</sup> This subparagraph will be deleted in the Revisor's Errors Bill

**MONITORING EXISTING SOUND LEVELS  
DRAGON PRODUCTS COMPANY  
OCEAN AVENUE QUARRY  
PORTLAND, MAINE**

**Prepared for: Kleinschmidt Associates  
Prepared by: Jacques Whitford  
July 23, 1997**





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**Gerber - Jacques Whitford**

Robert G. Gerber, Inc. - Jacques Whitford, Inc.  
*Consulting Engineers, Geologists and Environmental Scientists*

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Freeport, ME U.S.A. 04032

Tel: 207-865-6138  
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July 23, 1997  
File 971016

Mr. Jon Christensen  
Kleinschmidt Associates  
75 Main Street, P.O. Box 576  
Pittsfield, Maine 04967

**Subject:        Monitoring Existing Sound Levels  
                  Dragon Products Company, Ocean Avenue Quarry  
                  Portland, Maine**

Dear Mr. Christensen:

Jacques Whitford is pleased to present this report on the monitoring of existing sound levels at the Dragon Products Company (Dragon) Ocean Avenue Quarry and Cement Plant in Portland, Maine. Monitoring at the quarry was conducted to assess current sound levels at the site for comparison with applicable noise regulations.

### **Project Background**

Dragon Products is considering an expansion of their quarrying operations located on Ocean Avenue in Portland, Maine (Figure 1, Site Locus). As part of the expansion, the zoning of Dragon's property may change.

Dragon Products has been operating on Ocean Avenue in a residentially-zoned area. The property's zoning may change to industrial, or possibly a unique zone of its own, as the City reassesses its zoning ordinances. City of Portland noise regulations vary from zone to zone. The City allows a maximum average sound level of 75 dBA at the property lines in industrially-zoned areas. City of Portland regulations appear to contain no noise regulations for residential zones.

A new residential development has recently been constructed in the vicinity of the Dragon quarry. Residents of the new subdivision are concerned about the noise levels that may be generated by any expansion of the quarry. Consequently, Dragon implemented a noise assessment to address the concerns of their neighbors and assess compliance of their existing operations with the City of Portland Regulations.





## Methodology

The noise assessment was conducted with two Metrosonics dB-308 Sound Analyzers. Measurements were recorded for  $L_{eq}$  (equivalent steady state sound level) at one minute intervals during the testing. Measurements were also obtained for  $L_{max}$  (maximum sound level), and  $L_{10}$  (sound level exceeded 10 percent of the time).

Baseline measurements were obtained on Saturday, June 14, 1997 when the Dragon facility was not in operation. These measurements were collected to assess other sources of noise in the vicinity of the site. These measurements were collected at locations B1 and B2 as shown on the attached site map (Figure 2).

Noise data was collected during plant operations on June 16 and 17, 1997. Measurements were taken over two hour time periods at each location. All of the noise data was collected during the morning hours of operation, which Dragon reported to be the busiest times at the facility.

Noise measurements were collected at four locations on Ocean Avenue: directly across from the entrance to the site (N1); at the property line of the nearest southern neighbor (N2); at the property line of the nearest northeastern neighbor (N3); and at the property line of Summer Place, a newly constructed subdivision south of the site (N4). Measurements were also obtained around the perimeter of the quarry site, including the entrance to the facility (N5, N6, N7, N8). Approximate locations of each monitoring station are included in Figure 2.

## Results

The results of the monitoring are presented in Table 1, attached. The table indicates the test location, date/time, and presents the first hour equivalent steady state sound level data, the second hour equivalent steady state sound level data, and the two hour equivalent steady state sound level data. Test locations B1 and B2 were baseline measurements and were collected over a four hour period.

Baseline measurements collected while the plant was not in operation ranged from to 62.6 to 66.0 dB. The high reading was obtained from the baseline location (B1) directly across Ocean Avenue from the plant entrance.

Hourly noise measurements collected on June 16 and 17, 1997, ranged from 51.0 to 77.9 dB. The highest reading was collected at station N1, across Ocean Avenue from the facility entrance. Measurements collected around the perimeter of the quarry were all below 60 dB.



## Discussion

The measurements collected at the Dragon property lines and one location across Ocean Avenue indicate that the City of Portland industrial-zone standard of 75 dB was exceeded two times during the testing. The first hour of monitoring at location N5 at the Ocean Avenue property line resulted in a 76.1 dB equivalent steady state sound level. The first hour of monitoring at location N1 (across Ocean Avenue from the facility) was higher at 77.9 dB equivalent steady state sound level, indicating that traffic is a significant source of noise in the site vicinity.

The noise levels observed correspond to a period of relatively normal plant operation. However, our data must be qualified by the fact that changes in the operations at the plant (*e.g.*, changes in truck traffic volume), or variation in ambient neighborhood noise, may result in noise levels that are different from those reported herein. Furthermore, sound levels may vary based on ambient climatology (*e.g.*, temperature, humidity, wind).

## Closure

If you have any questions or require any additional information regarding this project, please call. We have enjoyed working with Kleinschmidt Associates and Dragon Products.

Sincerely,  
JACQUES WHITFORD



Nicholas O. Sabatine  
Project Manager



D. Todd Coffin  
Environmental Scientist

## Attachments:

- Table 1 - Noise Monitoring Results
- Figure 1 - Site Locus
- Figure 2 - Site Plan
- Appendix A - Time Histograms



**TABLE 1**  
**Noise Monitoring Results**  
**Dragon Products Company**  
**Ocean Ave., Portland, Maine**

Regulation		Permissible Noise Levels			
City of Portland (Residential Zoning)		No Noise Regulations			
City of Portland (Industrial Zoning)		75.0 dB (measured at the property line)			
Test Location	Date/Time	Hour 1 Sound Level (L <sub>eq</sub> )	Hour 2 Sound Level (L <sub>eq</sub> )	Two Hour Sound Level (L <sub>eq</sub> )	
B1 - Across from Plant Entrance	6/14/97 0830-1229	NA	NA	66.0 dB*	
B2 - Southern Neighbor Property Line	6/14/97 0830-1229	NA	NA	62.6 dB*	
N1 - Across from Plant Entrance	6/16/97 0650-0849	77.9 dB	74.0 dB	76.4 dB	
N2 - Southern Neighbor Property Line	6/16/97 0650-0849	65.2 dB	64.5 dB	65.0 dB	
N3 - Devito Property Line	6/16/97 0920-1119	65.6 dB	66.2 dB	65.9 dB	
N4 - Summer Place Property Line	6/16/97 0920-1119	63.4 dB	63.6 dB	63.6 dB	
N5 - Ocean Ave. Property Line	6/17/97 0700-0859	76.1 dB	71.9 dB	74.5 dB	
N6 - Quarry Southern Perimeter	6/17/97 0700-0859	53.3 dB	51.0 dB	52.3 dB	
N7 - Quarry Northern Perimeter	6/17/97 0940-1139	59.7 dB	59.7 dB	59.7 dB	
N8 - Quarry SW Perimeter	6/17/97 0940-1139	55.8 dB	54.8 dB	55.3 dB	

\* - Baseline measurements were collected over a four hour time period.

Mag 15.00  
Thu Jun 26 10:31 1997  
Scale 1:15,625 (at center)

1000 Feet

500 Meters

- Secondary SR/Road/Hwy Ramp
- State Route
- Interstate/Limited Access
- US Highway
- + + Railroad
- Point of Interest

DRAGON PRODUCTS QUARRY  
& CEMENT PLANT

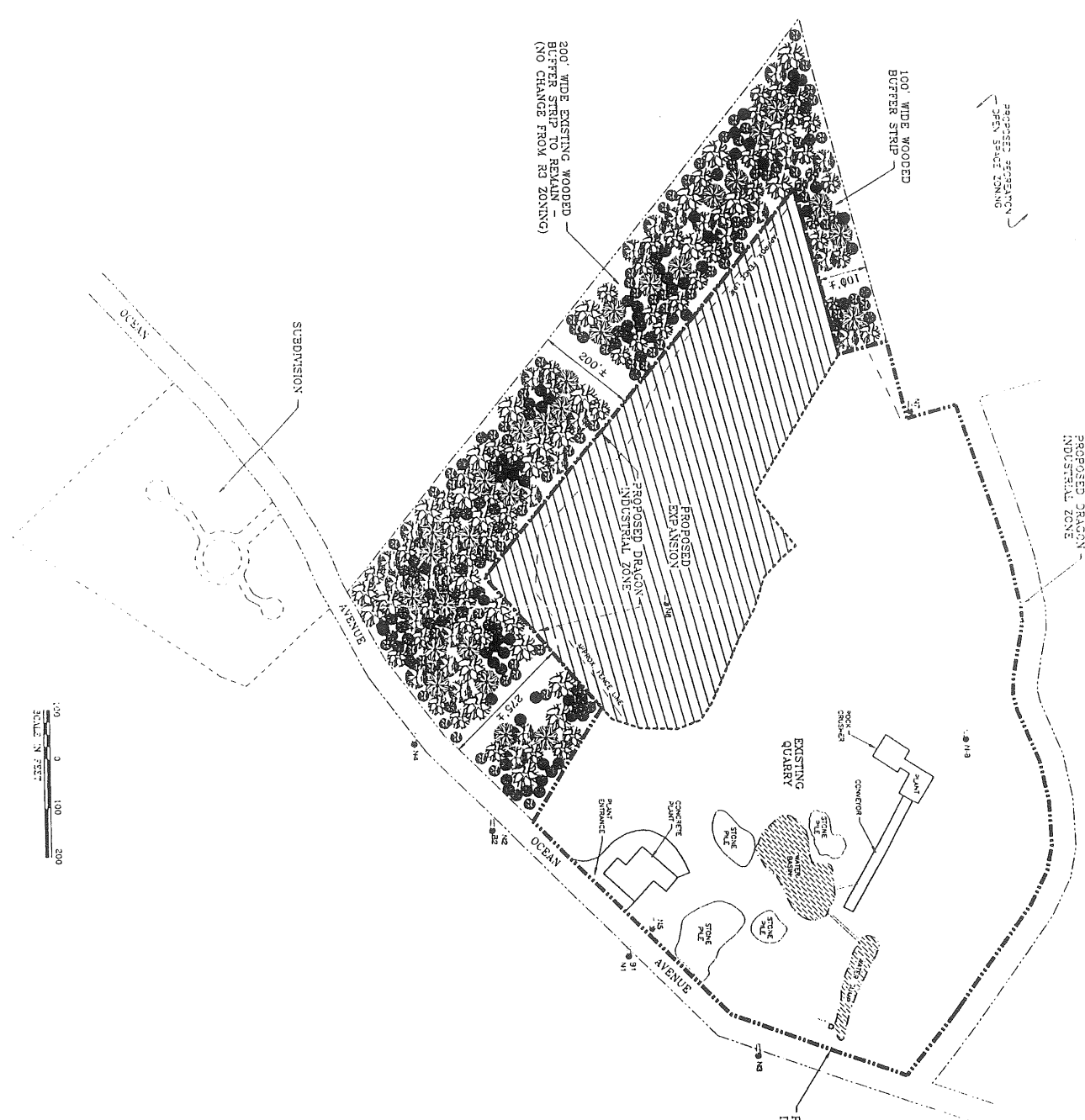
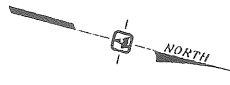
### SITE LOCUS

Dragon Products Company  
Ocean Avenue, Portland, Maine

Jacques Whitford  
Freeport, Maine

Figure 1

June 26, 1997



LEGEND  
 -M- 11 SOUND LEVEL MONITORING LOCATION POINTS

- NOTES
1. MONITORING EXISTING SOUND LEVELS LOCATION PLAN WAS PREPARED FROM A 1/4" = 1' SCALE PLAN OF THE SITE DATED 7/18/97. PROPOSED DRAGON INDUSTRIAL ZONE WAS ADDED TO THE PLAN ON 7/18/97. REVISIONS 1/9/98 AND 2/18/98.
  2. THE LOCATIONS OF MONITORING POINTS HAVE BEEN APPROXIMATELY DETERMINED IN THE FIELD IN RELATION TO EXISTING SITE FEATURES.

MONITORING EXISTING SOUND LEVELS  
 DRAGON PRODUCTS COMPANY  
 OCEAN AVENUE PLANT  
 KLEIN-SCHWIDT ASSOCIATES

**Robert G. Gerber, Inc.**  
 a subsidiary of Winford Company  
 Consulting Engineers and Environmental Scientists

DATE	2/98	SCALE	1/4" = 1'
APPROVED BY	[Signature]	SCALE	1/4" = 1'
FIGURE NUMBER	11-701	FIGURE NUMBER	1

**MONITORING EXISTING SOUND LEVELS  
DRAGON PRODUCTS COMPANY  
OCEAN AVENUE QUARRY  
PORTLAND, MAINE**

**Prepared for: Kleinschmidt Associates  
Prepared by: Jacques Whitford  
July 23, 1997**





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**Gerber - Jacques Whitford**

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174 South Freeport Road  
Freeport, ME U.S.A. 04032

Tel: 207-865-6138  
Fax: 207-865-1071

July 23, 1997  
File 971016

Mr. Jon Christensen  
Kleinschmidt Associates  
75 Main Street, P.O. Box 576  
Pittsfield, Maine 04967

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JACQUES WHITFORD



Nicholas O. Sabatine  
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N2 - Southern Neighbor Property Line	6/16/97 0650-0849	65.2 dB	64.5 dB	65.0 dB	
N3 - Devito Property Line	6/16/97 0920-1119	65.6 dB	66.2 dB	65.9 dB	
N4 - Summer Place Property Line	6/16/97 0920-1119	63.4 dB	63.6 dB	63.6 dB	
N5 - Ocean Ave. Property Line	6/17/97 0700-0859	76.1 dB	71.9 dB	74.5 dB	
N6 - Quarry Southern Perimeter	6/17/97 0700-0859	53.3 dB	51.0 dB	52.3 dB	
N7 - Quarry Northern Perimeter	6/17/97 0940-1139	59.7 dB	59.7 dB	59.7 dB	
N8 - Quarry SW Perimeter	6/17/97 0940-1139	55.8 dB	54.8 dB	55.3 dB	

\* - Baseline measurements were collected over a four hour time period.

Mag 15.00

Thu Jun 26 10:31 1997

Scale 1:15,625 (at center)

1000 Feet

500 Meters

- Secondary SR/Road/Hwy Ramp
- State Route
- Interstate/Limited Access
- US Highway
- + + Railroad
- Point of Interest

DRAGON PRODUCTS QUARRY & CEMENT PLANT

Graves Hill

OCEAN WOODS  
BRIDGEWOOD LN  
WELLSTONE

Andover College

Lunts Corner

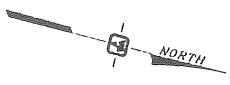
Edward Payson Park

### SITE LOCUS

Dragon Products Company  
Ocean Avenue, Portland, Maine

Jacques Whitford  
Freeport, Maine

Figure 1 June 26, 1997



200' WIDE EXISTING WOODED BUFFER STRIP TO REMAIN - (NO CHANGE FROM R3 ZONING)

100' WIDE WOODED BUFFER STRIP

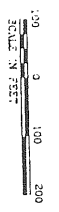
PROPOSED EXPANSION  
NEW 3-4-1 CONNO

PROPOSED DRAGON INDUSTRIAL ZONE

PROPOSED DRAGON INDUSTRIAL ZONE

EXISTING QUARRY  
ROCK CRUSHER  
CONVEYOR  
PLANT

PROPOSED DRAGON INDUSTRIAL ZONE



- NOTES:**
1. MONITORING EXISTING SOUND LEVELS LOCATION PLAN WAS REPRODUCED FROM A REPORT DATED 1/11/91 BY KLEIN-SCHMIDT ASSOCIATES CONSULTING ENGINEERS. THIS REPORT WAS APPROVED BY KLEIN-SCHMIDT ASSOCIATES CONSULTING ENGINEERS, DATED 2/8/91, REVISED 3/91.
  2. THE LOCATIONS OF MONITORING POINTS HAVE BEEN APPROXIMATELY DETERMINED IN THE FIELD IN RELATION TO EXISTING SITE FEATURES.

**LEGEND:**

● 14 SOUND LEVEL MONITORING LOCATION POINTS

<b>MONITORING EXISTING SOUND LEVELS</b>	
DRAGON INDUSTRIAL ZONE QUARRY	
KLEIN-SCHMIDT ASSOCIATES	
prepared for:	
<b>Robert G. Galtier, Inc.</b>	
10000 W. 10th Street, Suite 100	
Denver, Colorado 80202	
8. Monitoring Systems and Environmental Services	
DATE:	0-10-91
SCALE:	1" = 50'
PROJECT NUMBER:	J7918

## HISTORY OF DRAGON PRODUCTS COMPANY'S ZONING PROPOSAL

April, 1996: ICPAC zoning process provides notice to Dragon that adjacent land is being rezoned as part of overall review of Industrial Zoning in Portland. Dragon's Ocean Avenue site with quarry and concrete manufacturing operations is not included, despite the fact that it is located in an R-3 residential zone.

May, 1996: Dragon approaches Planning Board to have its site included in industrial rezoning and attends two workshops.

June 11, 1996: At public hearing before Planning Board, Summer Place residents raise objections to rezoning of site, and Dragon's request is dropped from the ICPAC process.

January, 1997: New industrial zoning is passed by City without changing the zoning of the Dragon site.

June, 1997: Dragon does a noise study to provide information on current operations to City and to neighborhood.

October, 1997: Dragon filed an application for contract zoning to allow blasting and mining on its site with the Planning Board.

November, 1997: Dragon hosts meeting of interested neighbors and provides site walk for neighbors and concerned citizens.

February 10, 1998: Planning Board holds first workshop to consider Dragon proposal and asks for more information about the site and its history and a text of the proposed contract zone.

April 28, 1998: Planning Board holds second workshop to review requested information and to discuss MeDEP mining standards, including vibration and blasting standards.

May 26, 1998: Dragon hosts site walk for Planning Board and Planning staff.

December 8, 1998: Planning Board holds third workshop and reviews plans showing proposed relocation of concrete manufacturing operations to rear of site, and redesign of Ocean Avenue portion of lot. Planning Board requests further details on Ocean Avenue redevelopment and reclamation plans for site after mining is completed.

May 9, 2000: Planning Board holds fourth workshop to review the requested information and proposal in more detail.

May 30, 2000: Planning Board holds fifth workshop with MeDEP blasting expert Mark Stebbins to review blasting issues and to view blasting video

June 27, 2000: Planning Board holds sixth workshop to discuss text of proposed contract and to schedule public hearing on proposal.

June 29, 2000: Dragon holds informational meeting with City Mayor, City Planner and representatives of area neighborhoods to discuss project

July 19, 2000: Dragon holds informational meeting at Presumpscot School for area neighbors, with notices sent to all taxpayers within 2,400 feet of the Dragon site per City records.

**Future Events:**

August 1, 2000: The City Planning Board will hold a special public hearing on proposed contract at City Hall.

Planning Board Recommendation: The Planning Board needs to make a recommendation to the City Council on the proposed contract zone.

City Council Consideration: The City Council has the final authority to approve or disapprove the proposed contract zone.

Planning Board Site Plan Review: If the City Council approves the proposed contract zone, the Planning Board will then review a more detailed site plan proposal for the site, including the relocation of the concrete plant and related structures and the redesign of the Ocean Avenue area of the site, according to the City Site Plan Review Ordinance.

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**MEMORANDUM**

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**TO:** DAVID GRINNELL  
**FROM:** ANN W. THAYER, C.G., ENVIRONMENTAL MANAGER  
**SUBJECT:** RECLAMATION STANDARDS FOR PORTLAND QUARRY  
**DATE:** 1/26/00

---

I understand that the Portland Planning Board has requested additional information on the reclamation of Dragon's Ocean Ave. quarry. The attached is a summary of reclamation requirements that are consistent with 38 MRSA 490-Z Performance Standards for Quarries. Reclamation, as defined under Article 8-A, means "the rehabilitation of the area of land affected by mining, including, but not limited to, stabilization of slopes and creation of safety benches, the planting of forests, the seeding of grasses..." The objective of the reclamation standard is to minimize the impact posed by an affected area.

Dragon will be required to restore the affected lands associated with the Ocean Ave operation to a condition that minimizes the safety risks posed by the site, is protective of future impacts to the environment (from fugitive dusts, soil and sediment run-off, etc) and is consistent with the intended future use of the site (residential, open-space, commercial or industrial use). In general, Dragon has an obligation to stabilize rock slopes to prevent rockfalls and to stabilize overburden in accordance with the best management practices for erosion and sedimentation control. In meeting the performance standard for quarry reclamation, Dragon will be required to address the following:

- A. Highwalls, or quarry faces, are to be treated in such a manner as to leave them in a condition that minimizes the possibility of rock falls, slope failures and collapse. A highwall that is loose may be controlled by the use of blasting or scaling, the use of safety benches, the use of flatter slopes or reduced face heights, or the use of benching near the top of the face or rounding the edge of the face.
- B. Exposed overburden or soil is to be stabilized to minimize erosion and promote sedimentation control. Slopes are to be graded to minimize run-off and exposed soil may be mulched or otherwise covered until a vegetative cover is established.
- C. A vegetative cover is to be established by seeding affected land except for quarry walls and flooded areas. Vegetative cover used in reclamation may consist of grasses, legumes, herbaceous or woody plants, shrubs, trees or a mixture of these.
- D. Unusable structures are to be removed and unusable access roads, haul roads and other support roads are to be reclaimed.
- E. Affected lands are to be reclaimed within 2 years after final operational grading has been reached.

**MONITORING EXISTING SOUND LEVELS  
DRAGON PRODUCTS COMPANY  
OCEAN AVENUE QUARRY  
PORTLAND, MAINE**

**Prepared for: Kleinschmidt Associates  
Prepared by: Jacques Whitford  
July 23, 1997**





*Maine Department of Environmental Protection*

Project Manager for RI/FS in Plymouth, Maine where operations at a former waste oil storage and transfer facility resulted in contamination of the underlying bedrock aquifer with PCB's solvents and semi volatile organics. Investigations involved detailed assessment of the source area, affected residential wells and the fractured bedrock aquifer.

*Maine Department of Environmental Protection*

Project Manager for RI/FS in South Berwick, Maine. Led evaluation of multiple potential source areas, migration pathways in the bedrock and surficial aquifer, and potential receptors of the groundwater contamination.

*Maine Department of Environmental Protection*

Program Manager for multi-method geophysical investigation and test pit program in search of buried drums and industrial waste at an unregulated landfill site in North Berwick, Maine.

*Phillips & Gordon*

Geologist for evaluation of bedrock and overburden groundwater contamination assessment in a Massachusetts community. A number of private residential water supply wells were found to be contaminated with chlorinated solvents and cyanide compounds. The contamination was attributed to historical disposal practices at a nearby plating facility.

*Baker Engineers*

Project Geologist - compiled Geologic information in support of Mississippi's bid to attract the federally funded super conducting, super collider. Responsibilities included compilation of published geologic data.

**Property Transfer Site Assessments**

*Central Maine Recycling*

Project Manager for the assessment of former poultry feed processing facility in Augusta, Maine. Investigated potential soil and groundwater contamination due to historic operations.

*Flakt Products*

Project Manager for the assessment and remediation of soil contamination due to operations at a metal fabrication facility in Fitchburg, Massachusetts. Acted as liaison between the client and the Massachusetts Department of Environmental Protection.

*Attorney*

Project Manager for environmental site assessment for property transfer in Westminster, Massachusetts. Performed hydrogeologic assessment of the property and used geophysical techniques to evaluate the migration of a leachate plume onto the property from an adjacent unlined landfill.

*Toll Brothers*

Performed numerous site assessment studies in Massachusetts, New Jersey, and Pennsylvania. Investigations have included geologic and hydrogeologic characterization of diverse geologic settings, geophysical surveys, radiation surveys, groundwater sampling and permeability testing.

---

## **Ann W. Thayer, C.G.**

*Environmental Manager*

### **Education**

Colby College

*B.A., Geology and Geology/Environmental Studies, 1986* Dean's list 1984-1986, Distinction in the major of Geology.

### **Continued Education**

- Caribbean Solid Waste - Independent Sabbatical
- JW Future Leader & Managers Training
- Visual MODFLOW
- Applied Geochemistry
- Harvard Negotiation Training
- ASFE Contracts and Loss Prevention
- Dense Non-Aqueous Phase Liquids in Fractured and Porous Media
- Hazardous Waste Site Supervisory Course
- 40 Hour Waste Site Health & Safety Course

### **Professional Background**

- Environmental Manager, Dragon Products Company, Thomaston, Maine, 1998
- Senior Project Manager, JacquesWhitford Company, Inc., Freeport, Maine, 1992 to 1997.
- Senior Geologist/Technical Manager, Weston Geophysical Corporation, Hallowell, Maine, 1989 to 1992.
- Geologist, Weston Geophysical Corporation, Westboro, Massachusetts, 1987 to 1989.
- Geophysical Field Technician, Maine Geological Survey, Augusta, Maine, 1986.
- Contractor, Department of Environmental Protection, Augusta, Maine, 1986.

### **Registration**

- Certified Geologist, #346, Maine

### **Professional Activities**

- Geological Society of Maine
- Environmental & Engineering Geophysical Society
- National Ground Water Association

### **Civic Activities**

- Registered Maine Guide
- Master Composter

### **Key Project Experience - Geologic and Geophysical Investigations**

Project Manager for investigation associated with Pike Industries' gravel mining and rock quarrying operation in Poland, Maine.

Project Geologist for geologic and geophysical mapping of subsurface conditions along supply pipeline route for a proposed power generating plant in northern Rhode Island.

Project Geologist for geologic and geophysical mapping of subsurface conditions along a proposed water distribution pipeline in northern Rhode Island.

Field Geologist for bedrock and soil slope stabilization project in Western Massachusetts.

Unstable material and excavated slopes caused several rock falls and soil slumps along an access road and transformer yard excavation for the Bear Swamp Pump Storage facility in Rowe, Massachusetts.

Project Geologist for major development project in New Ipswich, New Hampshire. Responsibilities included geologic mapping, coordination of seismic refraction program, and analytical evaluation of bedrock content and condition from low to high elevations throughout the property.



# DRAGON PRODUCTS COMPANY

## Ocean Avenue Quarry - Project Overview

*From house foundations to bridges that convey us to otherwise inaccessible places, concrete forms the framework of our society. As a key construction material, concrete is durable and strong. It won't rust, rot or burn, saving resources needed to replace less durable materials. In homes and buildings, concrete's thermal mass reduces energy needed for heat or cooling. So common is concrete that we seldom, if ever, think about what it is, who makes it and how it is part of our everyday lives.*

### DRAGON PRODUCTS COMPANY a Maine company that employs Maine people

Dragon Products Company has been a Maine supplier of cement and concrete since 1928. With corporate offices in Portland, Dragon operates New England's only cement manufacturing facility located in Thomaston. We are Maine's largest distributor of ready-mixed concrete with ten locations from Biddeford to Madawaska. Dragon employs over 200 full time employees with an annual payroll of over \$7 million.

Dragon's Portland concrete plant is located on Ocean Avenue. The history of the site dates back to 1930 when Joe Cook first produced crushed stone and concrete to support the growth of Portland. At that time, farms surrounded the site. As Portland grew, land use changed to include the adjacent City landfill. The landfill was operated from the late 1950's to the 1970's and the quarry continued to produce crushed stone through this period. In 1991, Dragon purchased the Ocean Avenue site. The quarry continued to operate until 1993 when Dragon realized that some type of zoning change would be necessary to access the proposed quarry expansion area.

As a member of the Portland community, Dragon has been the proud supplier of concrete for major improvement projects throughout the City of Portland that include these landmark projects:

- **Portland Public Market**
- **Casco Bay Bridge**
- **Barbara Bush Childrens' Hospital**
- **Portland Jetport**
- **Hadlock Field**

### LET'S START WITH CEMENT

Cement and concrete are often used interchangeably. Cement is actually an ingredient of concrete. It is a fine

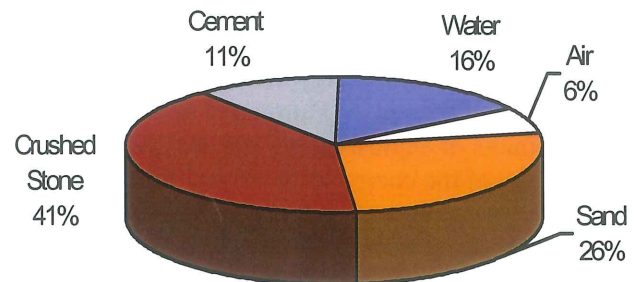
grey powder that, when mixed with sand and crushed stone, forms the rock-like product known as concrete.

The cement making process starts with limestone that we mine from our quarry in Thomaston. Other raw materials include sand and iron ore that we purchase from surrounding areas. The materials are ground and mixed with water to form a slurry. The slurry enters the sloping cement kiln where it is transformed through super heating to form an interim product called clinker. The clinker is inter-ground with gypsum to form the product we call cement.

Dragon ships the cement by truck, barge and rail to customers all over northern New England. Cement plants in Quebec and western New York are the next closest facilities to Maine. The cement plant in Thomaston helps to keep prices in our area competitive, saving taxpayer dollars on major infrastructure projects.

### WHAT ABOUT CONCRETE?

Concrete is a precise mixture of sand, crushed stone, cement and water. Just like milk, concrete has a shelf life.



We have 90 minutes from the time we start loading the truck to when the concrete needs to be discharged to meet industry specifications.

### A WORD ABOUT AGGREGATES

As you will notice from the graph, concrete is primarily made up of sand and crushed stone. We refer to these materials as "aggregates." Natural aggregates, especially crushed stone, are a major raw material for construction projects. A rule of thumb is that a cubic yard of concrete contains 1800 pounds of crushed stone. Consider some structures that you may recognize to get an appreciation of how much crushed stone goes into an average project.



**Jacques Whitford  
Company, Inc.**

75 Pearl Street, Suite 201, Portland, Maine, U.S.A. 04101  
Tel 207 761 7790 Fax 207 772 0385

Consulting Engineers  
Environmental Scientists  
Risk Consultants

**World Wide Web: [www.jacqueswhitford.com](http://www.jacqueswhitford.com)  
E-mail: [info@jacqueswhitford.com](mailto:info@jacqueswhitford.com)**

Maine • New Hampshire • Vermont • New York • Trinidad • Russia • Argentina  
Nova Scotia • New Brunswick • Prince Edward Island • Newfoundland & Labrador • Quebec • Ontario • Saskatchewan • Alberta • British Columbia • Northwest Territories

July 18, 2001

Mr. Dave Grinnell  
Dragon Products Company  
38 Preble Street  
P.O. Box 1521  
Portland, Maine 04104

Re: Follow-up Report on Geologic Assessment of Proposed Quarry Expansion, Ocean Avenue Quarry, Portland, Maine

Dear Mr. Grinnell:

Jacques Whitford Company, Inc. (JWC) is pleased to provide this report regarding Dragon Products Company's proposed quarry expansion project in Portland, Maine. This report addresses additional concerns raised during public meetings and in other correspondence directed to the City of Portland. The City of Portland's technical consultant, Mr. Mark Peterson of Peterson-Rabasca, requested that Dragon provide additional details to the Planning Staff. Our findings regarding each concern are detailed below.

**1. Potential Hazards Posed by Methane Gas Generated at the former City of Portland Landfill**

A letter from the City of Portland's consultant, Sebago Technics to the Maine Department of Environmental Protection (MDEP), dated June 11, 1996 states: "George Flaherty noted that the City had hired an independent firm to evaluate the potential to extract methane gas from the landfill. Apparently, field evaluations suggested there was little or no methane gas within the landfill, possible due to the frequent burning." These observations, combined with the age and closure history of the landfill, suggests that the blasting will not contribute to increased methane generation from the landfill.

**2. Potential for Groundwater Impacts Similar to those that Occurred in the Town of Gorham near a Site where Blasting Occurred.**

JWC contacted Brad Hahn, a project geologist with MDEP, regarding details on the Wyman's Autobody shop site on April 23, 2001. According to Mr. Hahn, the autobody shop is located in the Town of Gorham about 150 feet from an area of roadside blasting. A residential water supply well is located about 300 feet from the area of blasting, with the autobody shop located between the well and the blast area. Mr. Hahn indicated that MDEP initially linked blasting near the site to contamination of the residential well with solvents reportedly originating at the autobody shop. MDEP presently believes that the well may have been contaminated prior to blasting. Mr. Hahn added that MDEP conducted bedrock



blasting to put in a replacement water line to the impacted residence. Following blasting to put in the line, the water levels in the contaminated well dropped, and follow-up testing of the well detected no contamination.

These findings are consistent with blasting literature that indicates a very limited zone of bedrock fracture around blast sites (about 20 to 40 blasthole diameters)<sup>1</sup>. For a 6-in. hole, this is 10 to 20 feet. As such, there is no widespread creation of fractures to transport potential contaminants to off-site receptors, such as water wells. Research indicates that water levels in wells sometimes drop after a blast event, but recover over time<sup>1</sup>. This observation is related to the localized increase in aquifer storage capacity due to localized blast-induced fracturing. In these instances, water is actually moving *into* the newly created storage within the blast zone.

At the proposed Dragon Products quarry site, the zone of bedrock fracture will be limited to about 13 feet; the closest boundary of the landfill to the area of blasting is 100 feet. Furthermore, there are no water supply wells located within at least 2000 feet of the blast site. As concluded in our earlier report (dated November 8, 2000), the risk that blasting at the proposed quarry expansion will significantly impact water quality at the former landfill, or at properties in the former landfill vicinity, is low.

### 3. The Probability of Damage Associated with Blasting at the Quarry

Based on US Bureau of Mines research<sup>1,2</sup>, a peak particle velocity of 1 inch/sec (the MDEP standard proposed for the Dragon quarry expansion) corresponds to a probability of damage on the order of 1 percent. Therefore, the estimated 400 blast events proposed for the quarry could result in up to 4 incidents of damage where residences are subjected to peak particle velocities of 1 ips. At the relatively low particle velocities allowed by MDEP, the probability of damage from each blast event is independent (*i.e.*, not cumulative) because research has shown that damage associated with long-term fatigue is likely to occur only at vibration levels greater than 2 ips.<sup>1</sup>

In the context of this research, the threshold of damage was defined as "cosmetic damage of the most superficial type, of interior cracking that develops in all homes, independent of blasting."<sup>1</sup> Thus, even if 4 incidents of damage should occur over the 20 to 30 year period of quarry operations, the type of damage is likely to be very minor, and cosmetic in nature.

Furthermore, based on the blast design plan prepared by Maine Drilling and Blasting for the proposed quarry expansion, the highest particle velocity anticipated at the closest residence is 0.52 inches per second (ips). Based on studies of blasting by the US Bureau of Mines, no blast-induced damage (*i.e.*, zero percent probability) was observed at particle velocities

<sup>1</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.





Mr. Dave Grinnell  
July 18, 2001  
Page 3

below  $0.75 \text{ ips}^2$ . It is reasonable to conclude that if blast events are managed as anticipated, no damage to homes in the vicinity of the quarry would occur.

Please let us know if there are concerns other than those discussed above that you would like us to evaluate. JWC appreciates the opportunity to assist Dragon Products Company.

Sincerely,  
Jacques Whitford Company, Inc.



D. Todd Coffin, C.G.  
Senior Environmental Geologist

MEP00123\rept2

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<sup>2</sup> Charles H. Dowding, "Blast Vibration Monitoring and Control," Northwestern University, 1985.



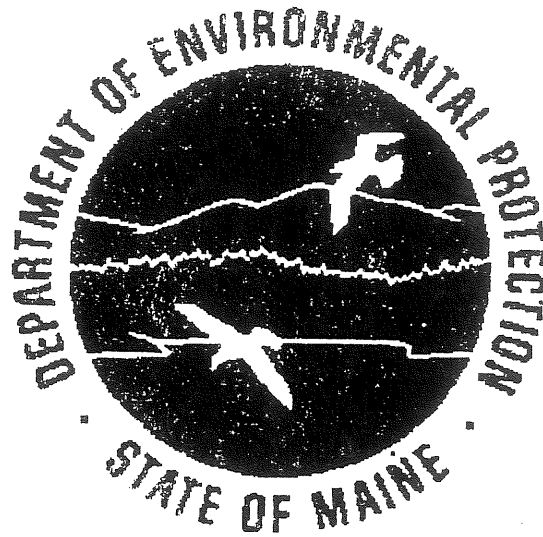
DRAGON INDUSTRIAL ZONE

STATE OF MAINE

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Article 8

Performance Standards for Quarries  
38 M.R.S.A. §§ 490-W to 490-EE



Bureau of Land and Water Quality  
DEPLW96-1

JULY 4, 1996

ATTACHMENT 6

(A)

## PERFORMANCE STANDARDS FOR QUARRIES

38 MRSA §§490-W TO 490-EE

### *Notes Concerning the Text*

*July 4, 1996*

*The following text of Article 8 (Performance Standards for Quarries) includes amendments made by the One Hundredth and Seventeenth Legislature, Second Regular Session. The table of contents and footnotes have been added to this document by the Department of Environmental Protection and are not part of the statutory text.*

*All copyrights and other rights to statutory text are reserved by the State of Maine. The text included in this publication is current to the end of the Second Regular Session of the 117th Legislature but is subject to change without notice. It is a version that is presumed accurate but which has not been officially certified by the Secretary of State. Refer to the Maine Revised Statutes Annotated and supplements for certified text.*



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**ARTICLE 8-A**  
**PERFORMANCE STANDARDS FOR QUARRIES**

**§490-W. Definitions**

As used in this article, unless the context otherwise indicates, the following terms have the following meanings.

1. **Affected land.** "Affected land" means all reclaimed and unreclaimed land, land that has or will have the overburden removed, land on which stumps, spoil or other solid waste has or will be deposited and storage areas or other land, except natural buffer strips, that will be or has been used in connection with a quarry.

2. **Airblast.** "Airblast" means an atmospheric compression wave resulting from the detonation of explosives, whether resulting from the motion of blasted materials or the expansion of gases from the explosion.

3. **Blaster.** "Blaster" means a person qualified to be in charge of or responsible for the loading and firing of a blast.

✓ 4. **Blasting.** "Blasting" means the use of explosives to break up or otherwise aid in the extraction or removal of a rock or other consolidated natural formation.

✓ 5. **Blast site.** "Blast site" means the area where explosive material is handled during the loading of drilled blastholes, including the perimeter formed by the loaded blastholes and 50 feet in all directions from loaded blastholes.

6. **Detonating cord.** "Detonating cord" means a flexible cord containing a center core of high explosives that may be used to initiate other explosives.

7. **Explosive.** "Explosive" means any chemical compound or other chemical substance that contains oxidizing or combustible materials used for the purpose of producing an explosion intended to break or move rock, earth or other materials.

8. **Flyrock.** "Flyrock" means rock that is propelled through the air or across the ground as a result of blasting and that leaves the blast area.

9. **Matting.** "Matting" means a covering placed over load holes and adjacent areas in order to minimize generation of flyrock and limit airblast effects.

✓ 10. **Natural buffer strip.** "Natural buffer strip" means an undisturbed area or belt of land that is covered with trees or other vegetation.

**11. Passenger car equivalents at peak hour.** "Passenger car equivalents at peak hour" means the number of passenger cars, or, in the case of nonpassenger vehicles, the number of passenger cars that would be displaced by nonpassenger vehicles, that pass through an intersection or on a roadway under prevailing roadway and traffic conditions at that hour of the day during which traffic volume generated by the development is higher than the volume during any other hour of the day. For purpose of this article, one tractor-trailer combination is the equivalent of 2 passenger cars.

**12. Peak particle velocity.** "Peak particle velocity" means the maximum rate of ground movement measured by any of the 3 mutually perpendicular components of ground motion.

**13. Preblast survey.** "Preblast survey" means documentation, prior to the initiation of blasting, of the condition of buildings, structures, wells or other infrastructures; protected natural resources; historic sites; and unusual natural areas.

**14. Private drinking water supply.** "Private drinking water supply" means a surface water supply, a dug well, a spring or a hole drilled, driven or bored into the earth that is used to extract drinking water for human consumption and that is not part of a public drinking water supply.

**15. Production blasting.** "Production blasting" means blasting conducted for the purpose of extracting or removing natural materials for commercial sale or beneficiation.

**16. Public drinking water source.** "Public drinking water source " means a groundwater well or a surface water source that directly or indirectly serves a water distribution system that has at least 15 service connections or regularly services an average of at least 25 individuals daily at least 60 days of the year.

✓ **17. Quarry.** "Quarry" means a place where rock is excavated.

**18. Reclamation.** "Reclamation" means the rehabilitation of the area of land affected by mining, including, but not limited to, the stabilization of slopes and creation of safety benches, the planting of forests, the seeding of grasses and legumes for grazing purposes, the planting of crops for harvest and the enhancement of wildlife and aquatic habitat and aquatic resources. "Reclamation" does not include the filling in of pits and the filling or sealing of shafts and underground workings with solid materials unless necessary for the protection of groundwater or for reasons of safety.

**19. Regulator.** "Regulator" means:

A. For a quarry located wholly within a municipality that is registered under section 490-DD to enforce this article, the municipality; and

B. For all other quarries, the Department of Environmental Protection.

20. **Rock.** "Rock" means a hard, nonmetallic material that requires cutting, blasting or similar methods of forced extraction.

21. **Stemming.** "Stemming" means inert material used in a blasthole to confine the gaseous products of detonation.

22. **Surface blasting.** "Surface blasting" means any blasting for which the blast area lies at the surface of the ground.

23. **Underground production blasting.** "Underground production blasting" means a blasting operation carried out beneath the surface of the ground by means of shafts, declines, adits or other openings leading to the natural material being mined or extracted.

#### §490-X. Applicability

This article applies to any quarry that is more than one acre in size, including reclaimed and unreclaimed areas, or at which underground production blasting is proposed.

The article does not apply to a quarry located wholly within the jurisdiction of the Maine Land Use Regulation Commission.

This article does not apply to an excavation or grading preliminary to a construction project, unless intended to circumvent this article.

A person with a valid permit for a quarry under article 6 must operate that quarry in compliance with the terms and conditions of that permit. Any modification of the permit must be in conformance with section 484. A person with a permit under article 6 may file a notice of intent to comply with this article. The permit issued under article 6 lapses as of the date a complete notice of intent is filed with the department. If the permittee chooses to substitute a notification pursuant to this article, all terms and conditions that applied to the permit issued pursuant to article 6 are incorporated into the notification approved pursuant to this article.

#### §490-Y. Notice of intent to comply

Except as provided in section 484-A, a person intending to create or operate a quarry under this article must file a notice of intent to comply before the total area of excavation of rock or overburden on the parcel exceeds one acre. Both reclaimed and unreclaimed areas are added together in determining whether this one-acre threshold is exceeded. A notice filed under this section must be complete, submitted on forms approved by the department and mailed to the <sup>1</sup>municipality where the quarry is located, <sup>2</sup>the department, the <sup>3</sup>Maine Historic Preservation Commission and <sup>4</sup>each abutting property owner. The notice that is mailed to the department must be sent by certified mail, return receipt requested. Upon receiving the postal receipt, the owner or operator may commence operation of the quarry.

A notice of intent to comply is not complete unless it includes the following:

1. **Name, address and telephone number.** The name, mailing address and telephone number of the owner of the quarry and, if different from the owner, the operator of the quarry;
2. **Map and site plan.** A location map and site plan drawn to scale showing property boundaries, stockpile areas, existing reclaimed and unreclaimed lands, proposed maximum acreage of all affected lands, all applicable private drinking water supplies or public drinking water sources and all existing or proposed solid waste disposal areas;
3. **Parcel description.** A description of the parcel including size and deed description;
4. **Legal interest.** A copy of the lease or other document showing that an operator who is not the owner has a legal right to excavate on the property. Stumpage information does not have to be shown;
5. **Information on abutters.** The names and addresses of abutting property owners;
6. **Signed statement.** A statement signed and dated by the owner or operator certifying that the quarry will be operated in compliance with this article; and
7. **Fees.** A fee paid to the department as provided by section 490-EE.

If the department determines that a notice filed under this section is not complete, the department must notify the owner or operator no later than 45 days after receiving the notice.

#### §490-Z. Performance standards for quarries

1. **Significant wildlife habitat.** Affected land may not be located in a significant wildlife habitat as defined in section 480-B, subsection 10 or in an area listed pursuant to the Natural Areas Program, Title 5, section 13076. The department may not grant a variance from the provisions of this subsection.
2. **Solid waste.** Solid waste, including stumps, wood waste and land-clearing debris generated on the affected land must be disposed of in accordance with chapter 13, including any rules adopted to implement those laws. The department may not grant a variance from the provisions of this subsection.
3. **Groundwater protection.** To ensure adequate groundwater protection, the following setback requirements must be met.
  - A. A 200-foot separation must be maintained between an excavation and a private drinking water supply that is point driven or dug and was in existence prior to the excavation.

B. A 100-foot separation must be maintained between an excavation and a private drinking water supply that is drilled into saturated bedrock and was in existence prior to the excavation.

C. Separation must be maintained between an excavation and a public drinking water source as follows:

(1) For systems serving a population of 500 persons or less, the minimum separation must be 300 feet;

(2) For systems serving a population of 501 persons up to 1,000 persons, the separation must be 500 feet;

(3) For systems serving a population of more than 1,000 persons, the separation must be 1,000 feet; and

(4) For any system that holds a valid filtration waiver in accordance with the federal Safe Drinking Water Act, 42 United States Code, Sections 300f to 300j-26 (1988), the separation must be 1,000 feet.

D. Refueling operations, oil changes, other maintenance activities requiring the handling of fuels, petroleum products and hydraulic fluids and other on-site activity involving storage or use of products that, if spilled, may contaminate groundwater, must be conducted in accordance with the department's spill prevention, control and countermeasures plan. Petroleum products and other substances that may contaminate groundwater must be stored and handled over impervious surfaces that are designed to contain spills. The spill prevention, control and countermeasures plan must be posted at the site.

E. In the event of excavation below the seasonal high water table, a 300-foot separation must be maintained between the limit of excavation and any predevelopment private drinking water supply and a 1000-foot separation must be maintained between the limit of excavation and any public drinking water source or area previously designated for potential use as a public drinking water source by a municipality or private water company.

The department may grant a variance from the provisions of paragraph C upon consultation with the persons or entity that controls the public drinking water supply affected by the excavation. The department may not grant a waiver from the provisions of paragraph A, B or D.

Excavation below the seasonal highwater table of an area previously designated for potential use as a public drinking water source by a municipality or private water company is prohibited. The department may grant a variance allowing excavation below the seasonal highwater table if the applicant demonstrates that the yield of groundwater flow to protected waters or wetlands or public drinking water sources or private drinking water supplies will not be adversely affected by the excavation.

In the event of excavation below the seasonal highwater table, the operator of a mining activity that affects by excavation activities a public drinking water source or private drinking water supply by contamination, interruption or diminution must restore or replace the affected water supply with an alternate source of water, adequate in quantity and quality for the purpose served by the supply. This provision is not intended to replace any independent action that a person may have whose water supply is affected by a mining activity.

**4. Natural buffer strip.** Existing vegetation within a natural buffer strip may not be removed. If vegetation within the natural buffer strip has been removed or disturbed by the excavation or activities related to operation of a quarry before submission of a notice of intent to comply, that vegetation must be reestablished as soon as practicable after filing the notice of intent to comply. The department may not grant a variance from the provisions of this subsection.

**5. Protected natural resources.** A natural buffer strip must be maintained between the working edge of an excavation and a river, stream, brook, great pond or coastal wetland as defined in section 480-B. A natural buffer strip must also be maintained between the working edge of an excavation and certain freshwater wetlands as defined in section 480-B and having the characteristics listed in paragraph B. Excavation activities conducted within 100 feet of a protected natural resource must comply with the applicable permit requirements under article 5-A. The width requirements for natural buffer strips are as follows.

A. A natural buffer strip at least 100 feet wide must be maintained between the working edge of the excavation and the normal high water line of a great pond classified as GPA or a river flowing to a great pond classified as GPA.

B. A natural buffer strip at least 75 feet wide must be maintained between the working edge of the excavation and a body of water other than as described in paragraph A, a river, stream or brook, coastal wetland or significant wildlife habitat contained within a freshwater wetland consisting of or containing:

(1) Under normal circumstances, at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation or open water, except for artificial ponds or impoundments; or

(2) Peat lands dominated by shrubs, sedges and sphagnum moss.

For purposes of this subsection, the width of a natural buffer strip is measured from the upland edge of a floodplain wetland. If no floodplain wetlands are present, the width is measured from the normal high water mark of the river, stream or brook. The width is measured from the normal high water mark of a great pond and upland edge of a freshwater or coastal wetland.

The department may not grant a variance from this subsection.

**6. Roads.** A natural buffer strip must be maintained between the working edge of an excavation and a road as follows.

A. A natural buffer strip at least 150 feet wide must be maintained between the working edge of an excavation and a road designated as a scenic highway by the Department of Transportation.

B. A natural buffer strip at least 100 feet wide must be maintained between the working edge of the excavation and any other public road.

C. A natural buffer strip at least 50 feet wide must be maintained between the working edge of an excavation and a private road or a right-of-way. If a private road is contained within a wider right-of-way, the buffer is measured from the edge of the right-of-way. The width of the natural buffer strip adjacent to a private road may be reduced if the applicant receives written permission from the persons having a right-of-way over the private road.

The department may not grant a variance from the provisions of paragraph A or C. The department may grant a variance from paragraph B if the variance does not result in the natural buffer strip being reduced to less than 50 feet between the working edge of the excavation and any road and if the owner or operator installs visual screening and safety measures as required by the department.

A distance specified in this subsection is measured from the outside edge of the shoulder of the road unless otherwise specifically provided.

**7. Property boundary.** A natural buffer strip at least 100 feet wide must be maintained between an excavation and any property boundary. This distance may be reduced to 10 feet with the written permission of the affected abutting property owner or owners, except that the distance may not be reduced to less than 25 feet from the boundary of a cemetery or burial ground. The natural buffer strip between quarries owned by abutting owners may be eliminated with the abutter's written permission if the elimination of this natural buffer strip does not increase the runoff from either excavation across the property boundary. All property boundaries must be identified in the field by markings such as metal posts, stakes, flagging or blazed trees. The department may not grant a variance from the provisions of this subsection.

**8. Erosion and sedimentation control.** All reclaimed and unreclaimed areas, except for access roads, must be naturally internally drained at all times unless a variance is obtained from the department. Stockpiles consisting of topsoil to be used for reclamation must be seeded, mulched or otherwise temporarily stabilized.

A. Sediment may not leave the parcel or enter a protected natural resource.

B. Grubbed areas not internally drained must be stabilized.

C. Erosion and sedimentation control for access roads must be conducted in accordance with the department's best management practices for erosion and sedimentation control.



The department may not grant a variance from the provisions of paragraph A, B or C.

**9. Surface water protection and storm water management.** Surface water discharges from areas not required to be naturally internally drained may not be increased as a result of storm water runoff from storms up to a level of a 25-year, 24-hour storm. Accumulated water from precipitation must be put into sheet flow and the discharge point must be directed to an undisturbed natural buffer strip. The discharge point must be at least 250 feet away from a protected natural resource. The slope of the discharge area may not exceed 5%.

Grading or other construction activity on the site may not alter natural drainageways so that the drainage, other than that which occurred before development, adversely affects an adjacent parcel of land or so that the drainageways flowing from an adjacent parcel of land to the parcel are impeded.

Structures such as detention ponds, retention ponds and undersized culverts may not be used to meet the standard in this subsection unless a variance is obtained from the department.

**10. Traffic.** The following provisions govern traffic.

A. Entrances and exits of the quarry must be located, posted and constructed in accordance with standards for roadways in rules adopted by the board. Adequate distances for entering, exiting and stopping must be maintained in accordance with these standards. The department may not grant a variance from the provisions of this subsection. This paragraph is repealed July 1, 1997.

B. Any excavation activity that generates 100 or more passenger car equivalents at peak hour must comply with the applicable permit requirements under article 6. This paragraph takes effect July 1, 1997.

**11. Noise.** Noise levels may not exceed applicable noise limits in rules adopted by the board.

**12. Dust.** Dust generated by activities at a quarry, including dust associated with traffic to and from a quarry, must be controlled by sweeping, paving, watering or other best management practices for control of fugitive emissions. Dust control methods may include calcium chloride as long as the manufacturer's labeling guidelines are followed. The department may not grant a variance from the provisions of this subsection.

**13. Reclamation.** The affected land must be restored to a condition that is similar to or compatible with the conditions that existed before excavation. Reclamation may be conducted in accordance with the department's best management practices for erosion and sedimentation control and must include the following.

A. Highwalls, or quarry faces, must be treated in such a manner as to leave them in a condition that minimizes the possibility of rock falls, slope failures and collapse. A highwall that is loose must be controlled by the use of blasting or scaling, the use of safety benches, the

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Article 1  
re DEP  
Site Act  
Regs

use of flatter slopes or reduced face heights or the use of benching near the top of the face or rounding the edge of the face.

B. A vegetative cover must be established by seeding or planting within one year of the completion of excavation. Vegetative cover must be established on all affected land, including safety benches, except for quarry walls and flooded areas. Topsoil must be placed, seeded and mulched within 30 days of final grading. Vegetative cover is acceptable if within one year of seeding:

(1) The planting of trees and shrubs results in a permanent stand or a stand capable of regeneration and succession sufficient to ensure a 75% survival rate; and

(2) The planting of all material results in permanent 90% ground cover.

Vegetative cover used in reclamation must consist of grasses, legumes, herbaceous or woody plants, shrubs, trees or a mixture of these.

C. All structures, once no longer in use, and all access roads, haul roads and other support roads must be reclaimed.

D. All affected lands must be reclaimed within 2 years after final grading.

E. Topsoil that is stripped or removed must be stockpiled for use in reclaiming disturbed land areas. The department may grant a variance from this paragraph if the applicant demonstrates that the soil is not needed for reclamation purposes.

F. The department may require a bond payable to the State with sureties satisfactory to the department or such other security as the department determines adequately secures compliance with this article, conditioned upon the faithful performance of the requirements set forth in this article. Other security may include a security deposit with the State, an escrow account and agreement, insurance or an irrevocable trust. In determining the amount of the bond or the security, the department shall take into consideration the character and nature of the overburden, the future suitable use of the land involved and the cost of grading and reclamation required. All proceeds of forfeited bonds or other security must be expended by the department for the reclamation of the area for which the bond was posted and any remainder returned to the operator.

G. The board may adopt or amend rules to carry out this subsection, including rules relating to operational or maintenance plans; standards for determining the reclamation period; annual revisions of those plans; limits, terms and conditions on bonds or other security; proof of financial responsibility of a person engaged in excavation activity or the affiliated person who guarantees performance; estimation of reclamation costs; reports on reclamation activities; and the manner of determining when the bond or other security may be discharged.

**14. Blasting.** The applicant must ensure that the blasting is conducted in accordance with Title 25, section 2441.

- A. The owner or operator shall use sufficient stemming, matting or natural protective cover to prevent flyrock from leaving property owned or under control of the owner or operator or from entering protected natural resources or natural buffer strips. Crushed rock or other suitable material must be used for stemming when available; native gravel, drill cuttings or other material may be used for stemming only if no other suitable material is available.
- B. The maximum allowable airblast at any inhabited building not owned or controlled by the developer may not exceed 129 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz.
- C. The maximum allowable airblast at an uninhabited building not owned or controlled by the developer may not exceed 140 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz.
- D. Monitoring of airblast levels is required in all cases for which a preblast survey is required by paragraph F. The department may waive the monitoring requirement if the owner or operator secures the permission of affected property owners to increase allowable airblast levels on their property and the department determines that no protected natural resource will be adversely affected by the increased airblast levels.
- E. If a blast is to be initiated by detonating cord, the detonating cord must be covered by crushed rock or other suitable cover to reduce noise and concussion effects.
- F. A preblast survey is required for all production blasting and must extend a minimum radius of 2000 feet from the blast site. The preblast survey must document any preexisting damage to structures and buildings and any other physical features within the survey radius that could reasonably be affected by blasting. Assessment of features such as pipes, cables, transmission lines and wells and other water supply systems must be limited to surface conditions and other readily available data, such as well yield and water quality. The preblast survey must be conducted prior to the initiation of blasting at the operation. The owner or operator shall retain a copy of all preblast surveys for at least one year from the date of the last blast on the development site.
- (1) The owner or operator is not required to conduct a preblast survey if the department determines that no protected natural resource within the limits of the otherwise required survey is likely to be affected by blasting and production blasting will not occur within 2000 feet of any building not owned or under the control of the developer.
  - (2) The owner or operator is not required to conduct a preblast survey on properties for which the owner or operator documents the rejection of an offer by registered letter, return receipt requested, to conduct a preblast survey. Any person owning a building within a preblast survey radius may voluntarily waive the right to a survey.

(3) The owner or operator is not required to conduct a preblast survey if the owner or operator agrees to design all blasts so that the weight of explosives per eight millisecond or greater delay does not exceed that determined by the equation  $W=(D/D_s)^2$ , where W is the maximum allowable weight of explosives per delay of 8 milliseconds or greater, D is the shortest distance between any area to be blasted and any inhabitable structure not owned or controlled by the developer and  $D_s$  equals  $70 \text{ ft.}/(lb.)^{1/2}$ .

G. Blasting may not occur in the period between sundown and sunrise the following day or in the period 7:00 p.m. and 7:00 a.m., whichever is greater. Routine production blasting is not allowed in the daytime on Sunday. Detonation of misfires may occur outside of these times but must be reported to the department within 5 business days of the misfire detonation. Blasting may not occur more frequently than 4 times per day. Underground production blasting may be exempted from these requirements provided that a waiver is granted by the department.

H. Sound from blasting may not exceed the following limits at any protected location:

Number of Blast Per Day	Sound Level Limit
1	129 dbl
2	126 dbl
3	124 dbl
4	123 dbl

I. The maximum peak particle velocity at inhabitable structures not owned or controlled by the developer may not exceed the levels established in Table 1 in paragraph K and the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1. The department may grant a variance to allow ground vibration levels greater than 2 inches per second on undeveloped property not owned or controlled by the applicant if the department determines that no protected natural resource, unusual natural area or historic site will be adversely affected by the increased ground vibration levels. If inhabitable structures are constructed on the property after approval of the development and prior to completion of blasting, the developer immediately must notify the department and modify blasting procedures to remain in compliance with the standards of this subsection.

J. Based upon an approved engineering study, the department may grant a variance to allow higher vibration levels for certain buildings and infrastructures. In reviewing a variance application, the department shall take into account that the standards in this paragraph and paragraph I are designed to protect conventional low-rise structures such as churches, homes and schools. In cases of practical difficulty, the department may grant a variance from paragraph I if it can be demonstrated that no adverse impacts on existing infrastructures or protected natural resources, unusual natural areas or historic sites will result.

K. Table 1 of this paragraph or the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 must be used to evaluate ground vibration effects for those blasts for which a preblast survey is required.

- (1) Either Table 1 of this paragraph or graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 may be used to evaluate ground vibration effects when blasting is to be monitored by seismic instrumentation.
- (2) Blasting measured in accordance with Table 1 of this paragraph must be conducted so that the peak particle velocity of any one of the 3 mutually perpendicular components of motion does not exceed the ground vibration limits at the distances specified in Table 1 of this paragraph.
- (3) Seismic instruments that monitor blasting in accordance with Table 1 of this paragraph must have the instrument's transducer firmly coupled to the ground.
- (4) An owner or operator using Table 1 of this paragraph must use the scaled-distance equation,  $W=(D/D_s)^2$ , to determine the allowable charge weight of explosives to be detonated in any 8 millisecond or greater delay period without seismic monitoring, where W is equal to the maximum weight of explosives, in pounds, and D and  $D_s$  are defined as in Table 1 of this paragraph. The department may authorize use of a modified scaled-distance factor for production blasting if the owner or operator can demonstrate to a 95% confidence level, based upon records of seismographic monitoring at the specific site of the mining activity covered by the permit, that use of the modified scaled-distance factor will not cause the ground vibration to exceed the maximum allowable peak particle velocities of Table 1 of this paragraph.
- (5) Blasting monitored in accordance with the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 must be conducted so that the continuously variable particle velocity criteria are not exceeded.

The owner or operator may apply for a variance of the ground vibration monitoring requirement prior to conducting blasting at the development site if the owner or operator agrees to design all blasts so that the weight of explosives per 8 millisecond or greater delay does not exceed that determined by the equation  $W=(D/D_s)^2$ , where W is the maximum allowable weight of explosives per delay of 8 milliseconds or greater, D is the shortest distance between any area to be blasted and any inhabitable structure not owned or controlled by the developer and  $D_s$  equals 70 ft./lb.<sup>1/2</sup>. As a condition of the variance, the department may require submission of records certified as accurate by the blaster and may require the owner or operator to document compliance with the conditions of this paragraph.

The following is Table 1.

Distance versus Peak Particle Velocity Method

Distance (D) from the blast area (feet)	Maximum allowable peak particle velocity (Vmax) for ground vibration (in./sec.)	Scaled-distance factor (Ds) to be applied without seismic monitoring
0 to 300	1.25	50
301-5000	1.00	55
Greater than 5000	0.75	65

L. A record of each blast, including seismographic data, must be kept for at least one year from the date of the last blast, must be available for inspection at the development or at the offices of the owner or operator if the development has been closed, completed or abandoned before the one-year limit has passed and must contain at a minimum the following data:

- (1) Name of blasting company or blasting contractor;
- (2) Location, date and time of blast;
- (3) Name, signature and social security number of blaster;
- (4) Type of material blasted;
- (5) Number and spacing of holes and depth of burden or stemming;
- (6) Diameter and depth of holes;
- (7) Type of explosives used;
- (8) Total amount of explosives used;
- (9) Maximum amount of explosives used per delay period of 8 milliseconds or greater;
- (10) Maximum number of holes per delay period of 8 milliseconds or greater;
- (11) Method of firing and type of circuit;

- (12) Direction and distance in feet to the nearest dwelling, public building, school, church or commercial or institutional building neither owned nor controlled by the developer;
- (13) Weather conditions, including such factors as wind direction and cloud cover;
- (14) Height or length of stemming;
- (15) Amount of mats or other protection used;
- (16) Type of detonators used and delay periods used;
- (17) The exact location of each seismograph and the distance of each seismograph from the blast;
- (18) Seismographic readings;
- (19) Name and signature of the person operating each seismograph; and
- (20) Names of the person and the firm analyzing the seismographic data.

M. All field seismographs must record the full analog wave form of each of the 3 mutually perpendicular components of motion in terms of particle velocity. All seismographs must be capable of sensor check and must be calibrated according to the manufacturer's recommendations.

#### **§490-AA. Inspections**

The department may periodically inspect a site, examine relevant records of the owner or operator of a quarry, take samples and perform tests necessary to determine compliance with the provisions of this article.

#### **§490-BB. Enforcement and penalties**

The department shall administer and enforce the provisions of this article.

**1. Stop-work order.** The department may order the owner or operator of a quarry that is not operating in compliance with this article to cease operations until the noncompliance is corrected.

**2. Penalty.** A person who violates a provision of this article commits a civil violation and is subject to the penalties established under section 349. Penalties assessed for enforcement actions taken by the State are payable to the State.

**3. Reclamation.** If, after an opportunity for a hearing, the commissioner determines that the owner of an excavation site or the person who was engaged in the excavation activity at the excavation site has violated this article, the commissioner shall direct the department staff or contractors under the supervision of the commissioner to enter on the property and carry out the necessary reclamation. The person engaged in mining or any affiliated person who guarantees performance at the excavation site is liable for the reasonable expenses of this necessary reclamation. The commissioner may use the bond or other security paid under section 490-Z, subsection 13, paragraph F to meet the reasonable expenses of reclamation.

#### **§490-CC. Variances**

An owner or operator must comply with the performance standards in section 490-Z unless a variance from those performance standards is approved by the department. Except when prohibited by section 490-Z, the department may grant a variance from the performance standards in this article if the owner or operator affirmatively demonstrates to the department that the variance does not adversely affect natural resources or existing uses and does not adversely affect the health, safety and general welfare of the public. A variance application must include any fee applicable under section 490-EE. The department shall process the variance application according to chapter 2 and the rules adopted by the department for processing an application. An applicant for a variance under this article shall hold a public informational meeting as described in those rules.

The department shall publish a timetable for responding to variance applications in the same manner prescribed in section 344-B. A variance is not valid unless approved by the department and, if a municipality is the regulator, the municipality. In making its decision on a variance application, the department shall consider comments or information received and the compliance record of the owner or operator. The department shall inform the owner or operator of any significant concerns or issues raised.

#### **§ 490-DD. Municipal enforcement; registration**

A municipality may register for authority to enforce this article by adopting and submitting to the commissioner an ordinance that meets or exceeds the provisions of this article. The commissioner shall review that ordinance to determine whether that ordinance meets the provisions of this article and if the municipality has adequate resources to enforce the provisions of this article. If the commissioner determines that the ordinance meets the provisions of this article and that the municipality has the resources to enforce this article, the commissioner shall register that municipality for authority to enforce this article. Immediately upon approval by the commissioner, primary enforcement authority for this article vests in that municipality. The commissioner may not approve an ordinance under this section unless the ordinance requires that any request for a variance from the standards in the article be approved by the commissioner before the variance is valid.

**1. Relation to home rule.** This section may not be construed to limit a municipality's authority under home rule to adopt ordinances regulating quarries.



2. **Optional participation.** This article may not be construed to require a municipality to adopt any ordinance.<sup>1</sup>

3. **Suspension of approval.** The commissioner may act to enforce any provision of this article or suspend the registration of a municipality if the commissioner determines that a municipal ordinance no longer conforms to the provisions of this article or that the municipality is not adequately enforcing this article. The commissioner shall notify a municipality of any such determination in writing. Suspension of municipal registration by the commissioner does not void or in any way affect a municipal ordinance or in any way limit the municipality's authority to enforce the provisions of its ordinance.

4. **Appeal.** A municipality may appeal to the board any decision of the commissioner under this section. Any decision by the board on appeal by a municipality constitutes final agency action.

#### **§ 490-EE. Transfer of ownership or operation, review before expansion; fees**

1. **Review before expansion.** Before expanding a quarry beyond an area that exceeds a total of 10 acres of reclaimed and unreclaimed land and before each additional 10-acre expansion, the owner or operator shall notify the regulator of the owner's or operator's intent to expand and must request an inspection. In the same manner as prescribed in section 344-B, the department shall publish a timetable for responding to inspection requests and shall inspect the site within that time period to determine the quarry's compliance with this article and other applicable laws administered by the department. The department may defer an inspection for a reasonable period when winter conditions at the site prevent the department from evaluating an expansion request. The department shall notify the owner or operator of a deferral under this section. Excavation activities may continue after the filing of a notice of an intent to expand. The failure of a regulator to conduct a site visit within a published time period is not a sufficient basis for a stop-work order under section 490-BB, subsection 1.

At the time of filing a notification of intent to expand, the owner or operator shall pay any fee required by this section.

2. **Transfer of ownership or operation.** A person who purchases a quarry that is operated under a notice of intent to comply, as established under section 490-Y, or who obtains operating authority of a quarry that operates under a notice of intent to comply must file within 2 weeks after the purchase or the obtaining of operating authority a notice of intent to comply on a form developed by the department. The new owner or operator may operate the quarry during this 2-week period without having filed a notice of intent to comply if the new owner or operator complies with all standards of this article.

3. **Fees.** The owner or operator a quarry shall pay the regulator:

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- A. An initial fee of \$250 upon filing a notice of intent to comply under section 490-Y;
- B. By March 1st of each year, an annual fee of:
  - (1) Three hundred fifty dollars for an excavation from which 2,500 cubic yards or more of material will be extracted during that year; and
  - (2) Fifty dollars for all other excavations. To be eligible for the annual fee under this paragraph, the owner or operator must include with the payment of this fee a signed statement certifying that less than 2,500 cubic yards of material will be extracted during that year;
- C. A fee of \$250 for each variance requested under section 490-CC, except for the following:
  - (1) A fee of \$500 for a variance to excavate below the seasonal high water table;
  - (2) A fee of \$500 for a variance to create an externally drained quarry;
  - (3) A fee of \$125, for a variance to waive the topsoil salvage requirement;
  - (4) A fee of \$125 for a variance to waive the monitoring requirements for airblasts and ground vibration; and
  - (5) A fee of \$250 upon filing a notice of intent to expand under section 490-EE; and<sup>1</sup>
- D. A fee of \$250 upon filing a notice of intent to expand under this section.

Notwithstanding any other provision of this subsection, the total for all fees paid under paragraphs A and B for one quarry in one calendar year may not exceed \$350.

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<sup>1</sup> This subparagraph will be deleted in the Revisor's Errors Bill



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Comer Brook, NF  
Goose Bay, LAB  
Hull, PQ  
Ottawa, ON  
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Regina, SK  
Calgary, AB  
Lethbridge, AB  
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December 7, 1998

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Project No. MEW 80419

**Re: Allowable Vibration Limits for Blasting Operations**

As requested we have reviewed the City of Portland's Zoning Ordinances, and Maine Department of Environmental Protection (M.D.E.P.) Performance Standards for Quarries regarding allowable vibration limits. The purpose of the review was to quantify how much more restrictive the City of Portland criterion was compared to the M.D.E.P. criterion, and to comment on the acceptability of the latter.

We understand that the City of Portland's Zoning Ordinances require that vibrations be limited to levels that correspond to displacements of less than 0.003 inches. M.D.E.P Performance Standards for Quarries make reference to the United States Department of the Interior "Bureau of Mines Report of Investigations 8507 (RI 8507)" for allowable vibration levels. A graph from this report is attached which shows the criteria for safe levels of blasting for houses which considers particle velocity, frequency, and displacement. The City of Portland's Zoning Ordinances displacement criterion can also be expressed in terms of frequency and particle velocity. We have shown this by superimposing the allowable displacement criterion from the City of Portland's Zoning Ordinances on the attached Bureau of Mines graph.

The M.D.E.P. standards also make reference to a table of allowable peak particle velocities for various distances from the blast site. Considering distance from the blast site takes into consideration the frequency of blast vibrations in that frequencies diminish with distance. This table was originally developed by the Office of Surface Mining based on the Bureau of Mines Report of Investigations 8507 (RI 8507) criterion.

We understand that the distances to neighboring houses from a proposed quarry in the city of Portland are between 300 and 5000 feet. Within this range of distances from a blast site, blast frequencies typically would be above 20 Hz. With respect to displacement, and for blasts having frequencies greater than 20 Hz, the City of Portland criterion is 2.7 times more restrictive than the M.D.E.P. criterion.



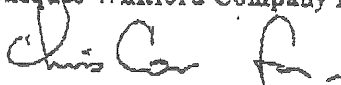
David S. Grinnell  
December 7, 1998

Page 2

In our experience, the U.S. Bureau of Mines RI 8507 criterion (M.D.E.P.) is conservative for safe levels of blasting vibrations for houses. Further, the RI 8507 criterion is widely used and to our knowledge is the industry accepted standard for most of North America for safe vibration levels in houses.

We trust that this meets your requirements at this time. If you any questions or if we can be of further assistance, please feel free to contact us.

Sincerely,  
Jacques Whitford Company Inc.



M. S. Whitford, P.E.



### APPENDIX B.—ALTERNATIVE BLASTING LEVEL CRITERIA

Safe blasting vibration criteria were developed for residential structures, having two frequency ranges and a sharp discontinuity at 40 Hz (table 13). There are blasts that represent an intermediate frequency case, being higher than the structure resonances (4 to 12 Hz) and lower than 40 Hz. The criteria of table 13 apply equally to a 35-Hz and a 10-Hz ground vibration, although

the responses and damage potentials are very much different.

Using both the measured structure amplifications (fig. 39) and damage summaries (figs. 52 and 54), a smoother set of criteria was developed. These criteria have more severe measuring requirements, involving both displacement and velocity (fig. B-1).

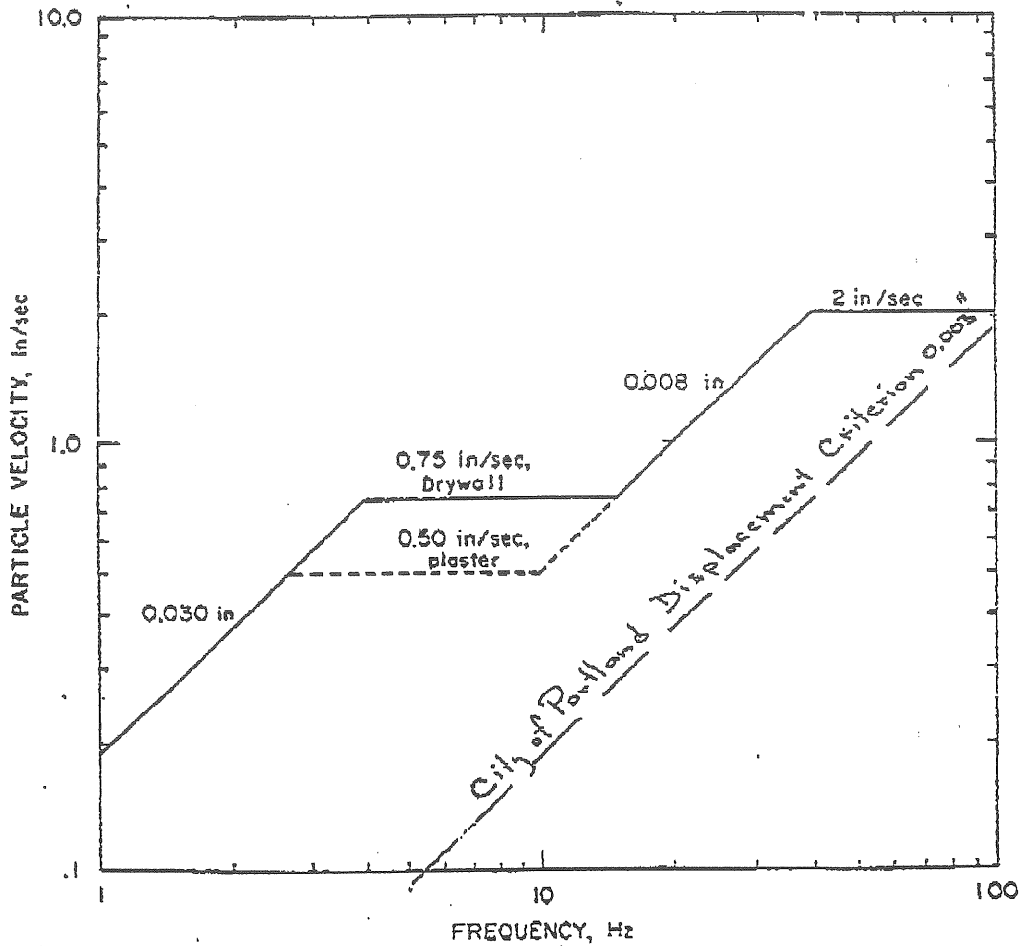


Figure B-1.—Safe levels of blasting vibration for houses using a combination of velocity and displacement.

**MONITORING EXISTING SOUND LEVELS  
DRAGON PRODUCTS COMPANY  
OCEAN AVENUE QUARRY  
PORTLAND, MAINE**

**Prepared for: Kleinschmidt Associates  
Prepared by: Jacques Whitford  
July 23, 1997**





**Gerber - Jacques Whitford**

Robert G. Gerber, Inc. - Jacques Whitford, Inc.  
Consulting Engineers, Geologists and Environmental Scientists

174 South Freeport Road  
Freeport, ME U.S.A. 04032

Tel: 207-865-6138  
Fax: 207-865-1071

July 23, 1997  
File 971016

Mr. Jon Christensen  
Kleinschmidt Associates  
75 Main Street, P.O. Box 576  
Pittsfield, Maine 04967

**Subject:      Monitoring Existing Sound Levels  
                 Dragon Products Company, Ocean Avenue Quarry  
                 Portland, Maine**

Dear Mr. Christensen:

Jacques Whitford is pleased to present this report on the monitoring of existing sound levels at the Dragon Products Company (Dragon) Ocean Avenue Quarry and Cement Plant in Portland, Maine. Monitoring at the quarry was conducted to assess current sound levels at the site for comparison with applicable noise regulations.

**Project Background**

Dragon Products is considering an expansion of their quarrying operations located on Ocean Avenue in Portland, Maine (Figure 1, Site Locus). As part of the expansion, the zoning of Dragon's property may change.

Dragon Products has been operating on Ocean Avenue in a residentially-zoned area. The property's zoning may change to industrial, or possibly a unique zone of its own, as the City reassesses its zoning ordinances. City of Portland noise regulations vary from zone to zone. The City allows a maximum average sound level of 75 dBA at the property lines in industrially-zoned areas. City of Portland regulations appear to contain no noise regulations for residential zones.

A new residential development has recently been constructed in the vicinity of the Dragon quarry. Residents of the new subdivision are concerned about the noise levels that may be generated by any expansion of the quarry. Consequently, Dragon implemented a noise assessment to address the concerns of their neighbors and assess compliance of their existing operations with the City of Portland Regulations.



## Methodology

The noise assessment was conducted with two Metrosonics dB-308 Sound Analyzers. Measurements were recorded for  $L_{eq}$  (equivalent steady state sound level) at one minute intervals during the testing. Measurements were also obtained for  $L_{max}$  (maximum sound level), and  $L_{10}$  (sound level exceeded 10 percent of the time).

Baseline measurements were obtained on Saturday, June 14, 1997 when the Dragon facility was not in operation. These measurements were collected to assess other sources of noise in the vicinity of the site. These measurements were collected at locations B1 and B2 as shown on the attached site map (Figure 2).

Noise data was collected during plant operations on June 16 and 17, 1997. Measurements were taken over two hour time periods at each location. All of the noise data was collected during the morning hours of operation, which Dragon reported to be the busiest times at the facility.

Noise measurements were collected at four locations on Ocean Avenue: directly across from the entrance to the site (N1); at the property line of the nearest southern neighbor (N2); at the property line of the nearest northeastern neighbor (N3); and at the property line of Summer Place, a newly constructed subdivision south of the site (N4). Measurements were also obtained around the perimeter of the quarry site, including the entrance to the facility (N5, N6, N7, N8). Approximate locations of each monitoring station are included in Figure 2.

## Results

The results of the monitoring are presented in Table 1, attached. The table indicates the test location, date/time, and presents the first hour equivalent steady state sound level data, the second hour equivalent steady state sound level data, and the two hour equivalent steady state sound level data. Test locations B1 and B2 were baseline measurements and were collected over a four hour period.

Baseline measurements collected while the plant was not in operation ranged from 62.6 to 66.0 dB. The high reading was obtained from the baseline location (B1) directly across Ocean Avenue from the plant entrance.

Hourly noise measurements collected on June 16 and 17, 1997, ranged from 51.0 to 77.9 dB. The highest reading was collected at station N1, across Ocean Avenue from the facility entrance. Measurements collected around the perimeter of the quarry were all below 60 dB.



## Discussion

The measurements collected at the Dragon property lines and one location across Ocean Avenue indicate that the City of Portland industrial-zone standard of 75 dB was exceeded two times during the testing. The first hour of monitoring at location N5 at the Ocean Avenue property line resulted in a 76.1 dB equivalent steady state sound level. The first hour of monitoring at location N1 (across Ocean Avenue from the facility) was higher at 77.9 dB equivalent steady state sound level, indicating that traffic is a significant source of noise in the site vicinity.

The noise levels observed correspond to a period of relatively normal plant operation. However, our data must be qualified by the fact that changes in the operations at the plant (*e.g.*, changes in truck traffic volume), or variation in ambient neighborhood noise, may result in noise levels that are different from those reported herein. Furthermore, sound levels may vary based on ambient climatology (*e.g.*, temperature, humidity, wind).

## Closure

If you have any questions or require any additional information regarding this project, please call. We have enjoyed working with Kleinschmidt Associates and Dragon Products.

Sincerely,  
**JACQUES WHITFORD**



Nicholas O. Sabatine  
Project Manager



D. Todd Coffin  
Environmental Scientist

## Attachments:

- Table 1 - Noise Monitoring Results
- Figure 1 - Site Locus
- Figure 2 - Site Plan
- Appendix A - Time Histograms

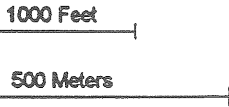


**TABLE 1**  
**Noise Monitoring Results**  
**Dragon Products Company**  
**Ocean Ave., Portland, Maine**

Regulation		Permissible Noise Levels			
City of Portland (Residential Zoning)		No Noise Regulations			
City of Portland (Industrial Zoning)		75.0 dB (measured at the property line)			
Test Location	Date/Time	Hour 1 Sound Level (L <sub>eq</sub> )	Hour 2 Sound Level (L <sub>eq</sub> )	Two Hour Sound Level (L <sub>eq</sub> )	
B1 - Across from Plant Entrance	6/14/97 0830-1229	NA	NA	66.0 dB*	
B2 - Southern Neighbor Property Line	6/14/97 0830-1229	NA	NA	62.6 dB*	
N1 - Across from Plant Entrance	6/16/97 0650-0849	77.9 dB	74.0 dB	76.4 dB	
N2 - Southern Neighbor Property Line	6/16/97 0650-0849	65.2 dB	64.5 dB	65.0 dB	
N3 - Devito Property Line	6/16/97 0920-1119	65.6 dB	66.2 dB	65.9 dB	
N4 - Summer Place Property Line	6/16/97 0920-1119	63.4 dB	63.6 dB	63.6 dB	
N5 - Ocean Ave. Property Line	6/17/97 0700-0859	76.1 dB	71.9 dB	74.5 dB	
N6 - Quarry Southern Perimeter	6/17/97 0700-0859	53.3 dB	51.0 dB	52.3 dB	
N7 - Quarry Northern Perimeter	6/17/97 0940-1139	59.7 dB	59.7 dB	59.7 dB	
N8 - Quarry SW Perimeter	6/17/97 0940-1139	55.8 dB	54.8 dB	55.3 dB	

\* - Baseline measurements were collected over a four hour time period.

Mag 15.00  
Thu Jun 26 10:31 1997  
Scale 1:15,625 (at center)



- Secondary SR/Road/Hwy Ramp
- State Route
- Interstate/Limited Access
- US Highway
- + + Railroad
- Point of Interest

DRAGON PRODUCTS QUARRY & CEMENT PLANT

**SITE LOCUS**

Dragon Products Company  
Ocean Avenue, Portland, Maine

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Jacques Whitford  
Freeport, Maine

Figure 1 June 26, 1997

## HISTORY OF DRAGON CONTRACT ZONING PROPOSAL

April, 1996: ICPAC zoning process provides notice to Dragon that adjacent land is being rezoned as part of overall review of Industrial Zoning in Portland. Dragon's Ocean Avenue site with quarry and concrete manufacturing operations is not included, despite the fact that it is located in an R-3 residential zone.

May, 1996: Dragon approaches Planning Board to have its site included in industrial rezoning and attends two workshops.

June 11, 1996: At public hearing before Planning Board, Summer Place residents raise objections to rezoning of the site, and Dragon's request is dropped from the ICPAC process.

January, 1997: New industrial zoning is passed by City without changing the zoning of the Dragon site.

June, 1997: Dragon does a noise study to provide information on current operations to City and to neighborhood.

October, 1997: Dragon filed an application for contract zoning to allow blasting and mining on its site with the Planning Board.

November, 1997: Dragon hosts meeting of interested neighbors and provides site walk for neighbors and concerned citizens.

February 10, 1998: Planning Board holds first workshop to consider Dragon proposal and asks for more information about the site and its history and a text of the proposed contract zone.

April 28, 1998: Planning Board holds second workshop to review requested information and to discuss MeDEP quarry standards, including vibration and blasting standards.

May 26, 1998: Dragon hosts site walk for Planning Board and Planning staff.

December 8, 1998: Planning Board holds third workshop and reviews plans showing proposed relocation of concrete manufacturing operations to rear of site, and redesign of Ocean Avenue portion of lot. Planning Board requests further details on Ocean Avenue redevelopment and reclamation plans for site after mining is completed.

May 9, 2000: Planning Board holds fourth workshop to review the requested information and proposal in more detail.

May 30, 2000: Planning Board holds fifth workshop with MeDEP blasting expert Mark Stebbins to review blasting issues and to view blasting video.

June 27, 2000: Planning Board holds sixth workshop to discuss text of proposed contract and to schedule public hearing on proposal.

June 29, 2000: Dragon holds informational meeting with City Mayor, City Planner and representatives of area neighborhoods to discuss project.

July 19, 2000: Dragon holds informational meeting at Presumpscot School for area neighbors, with notices sent to all taxpayers within 2,400 feet of the Dragon site per City records. City decides to put Planning Board process on hold until more information is gathered.

Fall/Winter 2000-01: Dragon prepares engineering report to address four major concerns raised by neighbors at public meetings, and chart showing effect of proposal on noise, vibration, dust and appearance. City hires independent engineer to review all information provided by Dragon. Dragon revises proposed contract to add provisions for liability and claims and for annual review of operations by City, per neighborhood request.

April 12, 2001: City hosts second informational meeting at Presumpscot School for area neighbors, to hear from City's engineer and to allow Dragon's blasting experts and engineers to present more information about its proposal, including blasting.

April 24, 2001: City Planning Board holds seventh workshop on proposal with City Engineer and Dragon engineers.

September 25, 2001: City Planning Board holds eighth workshop to review major issues and text of contract. Public hearing set for October.

October 9, 2001: Dragon hosts meeting at Topsham Quarry so that PB members and City Staff can experience actual blasts.

**Future Events:**

Planning Board Recommendation: The Planning Board needs to make a recommendation to the City Council on the proposed contract zone.

City Council Consideration: The City Council has the final authority to approve or disapprove the proposed contract zone.

Planning Board Site Plan Review: If the City Council approves the proposed contract zone, the Planning Board will then review a more detailed site plan proposal for the site, including the relocation of the concrete plant and related structures and the redesign of the Ocean Avenue area of the site, according to the City Site Plan Review Ordinance.

Maine DEP compliance: If Dragon receives final approval from the City of Portland, it then will file a formal notice of intent to comply with current MeDEP Quarry Performance Standards, giving the MeDEP jurisdiction over the blasting operations.

DRAFT: 10-18-01  
P:\CSN\DRAGON\History.doc



**Jacques Whitford  
Company, Inc.**

Consulting Engineers  
Environmental Scientists  
Risk Consultants

75 Pearl Street, Suite 201, Portland, Maine, U.S.A. 04101  
Tel 207 751 7790 Fax 207 772 0385

**World Wide Web: [www.jacqueswhitford.com](http://www.jacqueswhitford.com)  
E-mail: [info@jacqueswhitford.com](mailto:info@jacqueswhitford.com)**

Maine • New Hampshire • Vermont • New York • Trinidad • Russia • Argentina  
Nova Scotia • New Brunswick • Prince Edward Island • Newfoundland & Labrador • Quebec • Ontario • Saskatchewan • Alberta • British Columbia • Northwest Territories

November 8, 2000

Mr. Dave Grinnell  
Dragon Products Company  
38 Preble Street  
P.O. Box 1521  
Portland, Maine 04104

Re: Report on Geologic Assessment of Proposed Quarry Expansion, Ocean Avenue Quarry,  
Portland, Maine

Dear Mr. Grinnell:

Jacques Whitford Company, Inc. (JWC) is pleased to provide this report on a geologic assessment of the proposed Dragon Products Company expansion of the Ocean Avenue Quarry in Portland, Maine. In accordance with our proposal dated July 25, 2000, JWC evaluated the proposed quarry expansion relative to the following concerns expressed by area citizens:

1. Blasting rock may result in the release and migration of groundwater contaminants from the closed Ocean Avenue Landfill to area properties.
2. Blasting rock may result in increased radon levels at area properties.
3. Blasting may damage natural gas pipelines or result in natural gas line explosions.
4. Repeated blasting may cause longer-term structural fatigue and damage to homes.

### **Project Location and Background**

The Dragon Products Company quarry is located west of Ocean Avenue, just north of Graves Hill in Portland, Maine. Site location plans are shown on Figures 1 and 2. The site is bounded to the north and south by undeveloped woods and residential property, to the east by Ocean Avenue, and to the west by the former City of Portland Ocean Avenue Landfill. Undeveloped woods and residential properties lie east of the quarry, across Ocean Avenue.



The rock quarry consists of about 20 acres, and has been in operation for over 70 years<sup>2</sup>. Construction of the existing garage and offices at the site were completed around 1939. Production of concrete at the site began in the 1940's.

Dragon Products Company is proposing improvements to the property, and limited expansion of the rock quarry. Improvements include relocation of the concrete production building and cement silo away from Ocean Avenue (towards the interior of the existing quarry), construction of a vegetated earthen berm along Ocean Avenue, construction of a new paved entrance north of the existing entrance, and addition of a climbing lane on Ocean Avenue. Removal of rock will be accomplished with a maximum of 20 rock blast events per year. Blasting will be conducted in accordance with a blast design plan that helps assure safe and efficient removal of the rock resource.

## Findings

The findings of our assessment are detailed below. Concerns raised by area citizens are discussed individually under the headings presented in the opening paragraph of this letter.

1. *Blasting rock may result in the release and migration of groundwater contaminants from the closed Ocean Avenue Landfill to area properties.*

The City of Portland Ocean Avenue landfill reportedly operated for approximately 20 years until its closure in 1978.<sup>1</sup> In 1987, the City of Portland installed bedrock monitoring wells around the perimeter of the landfill. Sampling of groundwater from the bedrock wells between 1987 and 1994 indicated slightly elevated concentrations of hardness, specific conductance, calcium, iron, magnesium, manganese and potassium.<sup>2</sup> In a letter to the City of Portland dated June 11, 1996, Sebago Technics reported that the water quality data between 1987 and 1994 remained relatively constant, and created "no observable health risks." Properties in the area surrounding the former landfill are served by public water provided by the Portland Water District.

The City of Portland is presently completing closure of the landfill in accordance with criteria established by the Maine Department of Environmental Protection (MDEP). Installation of a landfill cover is substantially complete, and a fence has been erected to help prevent unauthorized access.

JWC reviewed the proposed Dragon Products Company blast design plan to evaluate whether blasting would result in the release and migration of groundwater contaminants at the landfill. The blast design plan, prepared by Maine Drilling & Blasting, Inc., specifies controlled blasting using timed delays and requirements for blast hole diameter, depth, spacing, and charge weight,

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<sup>1</sup> Haley & Aldrich, Inc., "Report on Oil and Hazardous Material Site Evaluation, Cook Concrete Property, Portland, Maine." February, 1991.

<sup>2</sup> Sebago Technics, "City of Portland - Ocean Avenue Landfill," June 11, 1996.





among others (refer to Appendix A). Given the parameters proposed in the blast design plan, a peak particle velocity (a measure of seismic vibration) of about 4.8 inches per second (ips) is estimated for the portion of the landfill closest to the proposed quarry expansion area. Dragon Products Company provides a buffer of at least 100 feet between the proposed quarry expansion area and the landfill.

The estimated particle velocity at the landfill is well below that which would result in fracturing of bedrock. Therefore, the risk of release and migration of contaminants through air, soils or water, as a result of blast-induced fractures at the landfill, is low. For example, researchers have identified a conservative lower limit for cracking of granite at a seismic velocity of 28 ips.<sup>3</sup> Other sources report that the radius of rock fracturing around a blast hole is limited to a radius of 20 to 40 blast-hole diameters.<sup>4</sup> Based on this guidance, the zone of rock fracturing beyond the quarry expansion area would be limited to about 13 feet. The relatively low particle velocities estimated for the landfill site are also unlikely to cause damage (such as opening of fissures) to the landfill cover.

In summary, previous reports indicate that the former City of Portland Ocean Avenue Landfill has had some impact on groundwater quality, but not at concentrations that pose a significant threat to human health or the environment at area properties. Due to the relatively low seismic velocities estimated by Maine Drilling & Blasting, Inc., the risk that blasting at the proposed quarry expansion will significantly impact water quality at the former landfill, or at properties in the former landfill vicinity, is low. Maine Drilling & Blasting has prepared a blast design plan to minimize the effects of blasting at the site and in the site vicinity.

*2. Blasting rock may result in increased radon levels at area properties.*

Discussions with Robert Stillwell of the Maine Radiation Control Program indicate numerous incidences of high radon levels at homes in the vicinity of the proposed Dragon Products Company quarry expansion.<sup>5</sup> Radon is a naturally-occurring radioactive gas that originates in rock and sediment. Radon can be present in homes as a result of migration from bedrock fractures and pore space in sediments. At certain concentrations, radon poses a health risk.

JWC reviewed the Maine Drilling & Blasting, Inc., blast plan for the proposed quarry expansion to evaluate the potential for the release of radon to area properties as a result of rock blasting. The blast plan provides estimated peak particle velocities at distances ranging from 300 to 600 feet from the quarry expansion boundary. The closest residence is about 300 feet from the quarry expansion boundary. The estimated peak particle velocities reported by Maine Drilling & Blasting, Inc., range from 0.27 to 0.52 ips.

<sup>3</sup> Charles H. Dowding, "Blast Vibration Monitoring and Control," Northwestern University, 1985.

<sup>4</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.

<sup>5</sup> Robert Stillwell, Letter to Ann Elderkin, P.A., City of Portland, regarding radon levels in the Portland area, dated April 15, 1999.



The predicted range of seismic velocities at area residences is at least 50 times lower than that required to fracture crystalline bedrock.<sup>3</sup> As a result, the closest residence, located about 300 feet from the quarry expansion boundary, is well beyond the predicted zone of bedrock fracturing. As reported earlier in this report, the zone of rock fracturing is limited to a radius of about 13 feet from each blast hole. Based on this data, the risk that blasting at the proposed quarry expansion area will result in the release of radon to homes or other structures as a result of rock fracturing, is negligible. Blast-induced vibration of rock and sediment alone would not result in a significant release of radon given the relatively low particle velocities predicted, and the short duration of blast events.

In summary, while high radon levels have been reported in the vicinity of the proposed quarry expansion area, the risk that blasting of bedrock and associated vibrations will result in a significant release of radon, is negligible. This finding is based on the low vibration levels predicted for the surrounding areas as detailed in the blast design plan by Maine Drilling & Blasting, Inc. (Appendix A).

*3. Blasting may damage natural gas pipelines or result in natural gas line explosions.*

JWC contacted Northern Utilities, Inc., to identify natural gas pipelines in the vicinity of the proposed quarry expansion area. Pipeline maps provided by Northern Utilities indicate the closest gas lines to the quarry are located at the Wellstone Condominium complex, about 1,800 feet south of the southernmost quarry expansion boundary. Based on this distance and the blast plan data provided by Maine Drilling & Blasting, Inc., JWC calculated a peak particle velocity of 0.05 ips. This low particle velocity is substantially below the United States Bureau of Mines "safe" particle velocity of 2.0 ips.<sup>6</sup> The threshold for damage, defined as the development of cracks in plaster, is generally considered to occur at a velocity of 2.0 ips.

Given the considerable distance from the proposed quarry expansion area to the nearest natural gas pipeline, JWC finds that the risk of damage to this pipeline, as a result of blasting at the quarry, is negligible. The predicted vibration levels at the pipeline are about 40 times less than the damage threshold for structures of 2.0 ips.

*4. Repeated blasting may cause longer-term structural fatigue and damage to homes.*

JWC evaluated the potential for repeated blasting events to result in damage to off-site structures due to structural fatigue. A number of studies have been undertaken by the United States Bureau of Mines and others to assess the effects of repeated blasting on structures.<sup>6</sup> For example, the Bureau of Mines subjected a wood frame house, located an estimated 100 to 200 feet from a mine, to 587 production blasts, after which it was mechanically shaken to determine the threshold for fatigue cracking. The first crack appeared after the equivalent of 28 years of

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<sup>6</sup> Calvin J. Konya and Edward J. Walter. "Subsurface Blast Design." Prentice Hall. Englewood Cliffs, New Jersey, 1990.



blasting, twice a day, at a vibration level of 0.5 ips. The reported damage consisted of a cracked wall board tape joint.<sup>6</sup>

Studies of the effects of repeated low-level vibrations from blasting indicate little potential for damage to structures. Reports indicate that particle velocities approaching 2.0 ips are required to create damage under repeated blasting scenarios; the predicted range of particle velocities for properties in the vicinity of the quarry expansion is 0.27 to 0.52 ips. As stated earlier in this report, 2.0 ips is commonly cited as the threshold for damage during a single blast event.

### Conclusions

The Dragon Products Company quarry on Ocean Avenue has been in operation for over 70 years. Dragon is proposing improvements to the property and limited expansion of rock quarry operations that will involve a maximum of 20 blast events per year. Area residents have expressed concerns over the impacts of rock blasting, including the potential for the release of contaminants from the closed City of Portland Ocean Avenue Landfill, release of radon at area residences, damage to natural gas pipelines, and structural damage to buildings due to repeated blasting events.

Maine Drilling & Blasting, Inc., has prepared a site-specific blast design plan that specifies controlled blasting using timed delays and requirements for blast hole diameter, depth, spacing, and charge weight, among others. JWC has reviewed this plan relative to each of the concerns expressed by the area citizens. JWC concludes that the risk of impacts to the neighborhood for each area of concern is low. This finding is based on the substantial distance of off-site buildings and natural gas pipelines from the quarry, the relatively low predicted blast-induced vibrations beyond the quarry expansion area, and scientific data on the impacts of blasting gathered by researchers, including the United States Bureau of Mines.

### Closure

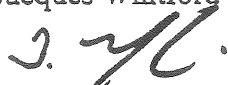
JWC's findings are based solely on the scope of work conducted and sources of information referenced in this report. Any additional information that becomes available concerning this site should be provided to us so that our conclusions may be reviewed and modified, if necessary. Our work has been undertaken in accordance with generally accepted consulting engineering practices. No other warranty, expressed or implied, is made.



Mr. Dave Grinnell  
November 8, 2000  
Page 6

Please feel free to contact us should you have any questions regarding this report.

Sincerely,  
Jacques Whitford Company, Inc.



D. Todd Coffin, C.G.  
Senior Environmental Geologist

Figure 1 Dragon Products Quarry, Portland, ME  
Figure 2 Site Plan  
Appendix A Blast Design Plan

MEP00123\rept1



**APPENDIX A**  
**BLAST DESIGN PLAN**



Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 600 Feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming Stone
Hole Diameter	<u>4.0"</u>			
Burden	<u>8'</u>			
Spacing	<u>9'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>124.70 lbs</u>		Dry Load:	16.3' PELLITE (ANFO)
Pounds per Hole	<u>124.70 lbs</u>			
Total Est. Pounds	<u>6234.95 lbs</u>			
Powder Factor	<u>1.42 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	8.8' EXTRA 1300 3"	
		Bottom Load:	3.0' SLURRAN 430 3"	

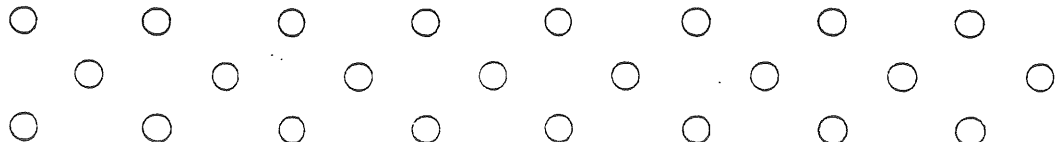
Blast Plan Notes  
 4 inch diameter hole

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>600</u>	Distance to Structure
lbs per Delay (w)	<u>124.70</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>53.73</u>	( sd = d / square root of w )
Esimated PPV	<u>0.27</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 600' from a structure utilizing 4.0" diameter at a 8' by 9' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 450 Feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming Stone
Hole Diameter	<u>4.0"</u>			
Burden	<u>8'</u>			
Spacing	<u>9'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>124.70 lbs</u>		Dry Load:	16.3' PELLITE (ANFO)
Pounds per Hole	<u>124.70 lbs</u>			
Total Est. Pounds	<u>6234.95 lbs</u>			
Powder Factor	<u>1.42 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	8.8' EXTRA 1300 3"	
		Bottom Load:	3.0' SLURRAN 430 3"	

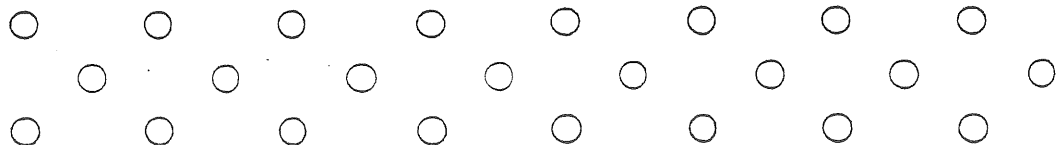
Blast Plan Notes  
 4 inch diameter hole

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>450</u>	Distance to Structure
lbs per Delay (w)	<u>124.70</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>40.30</u>	( sd = d / square root of w )
Esimated PPV	<u>0.43</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 450' from a structure utilizing 4.0" diameter at a 8' by 9' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



MAINE DRILLING AND BLASTING, INC.

Elast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 400 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming Stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>8'</u>			
Spacing	<u>8'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>94.64 lbs</u>		Dry Load:	16.9' PELLITE (ANFO)
Pounds per Hole	<u>94.64 lbs</u>			
Total Est. Pounds	<u>4732.20 lbs</u>			
Powder Factor	<u>1.21 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	9.1' EMGEL250 -2.75	
		Bottom Load:	2.0' POWER PRIMER	

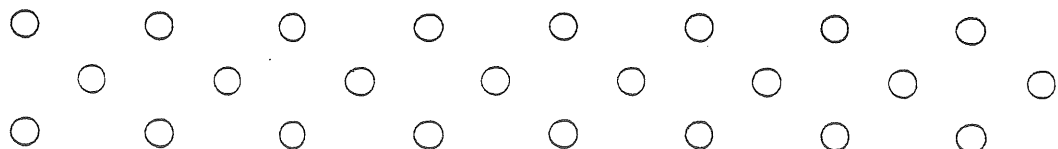
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>400</u>	Distance to Structure
lbs per Delay (w)	<u>94.64</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>41.12</u>	( $sd = d / \text{square root of } w$ )
Esimated PPV	<u>0.42</u>	( $ppv = k * sd^{-1.6}$ )

Typical for production work consistent holes 33' deep at 400' from a structure utilizing 3.5" diameter at a 8' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )





MAINE DRILLING AND BLASTING, INC.

Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 350 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming Stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>8'</u>			
Spacing	<u>8'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>94.64 lbs</u>		Dry Load:	16.9' PELLITE (ANFO)
Pounds per Hole	<u>94.64 lbs</u>			
Total Est. Pounds	<u>4732.20 lbs</u>			
Powder Factor	<u>1.21 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	9.1' EMGEL250 -2.75	
		Bottom Load:	2.0' POWER PRIMER	

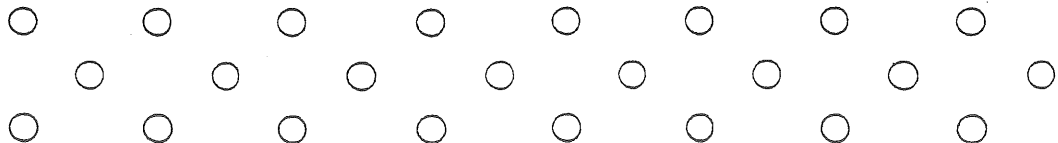
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>350</u>	Distance to Structure
lbs per Delay (w)	<u>94.64</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>35.98</u>	( sd = d / square root of w )
Esimated PPV	<u>0.52</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 350' from a structure utilizing 3.5" diameter at a 8' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



MAINE DRILLING AND BLASTING, INC.

Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting w/deck at 300 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	6.0' Stemming Stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>7'</u>			
Spacing	<u>8'</u>		Dry Load:	7.5' PELLITE (ANFO)
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>42.28 lbs</u>		Wet Load:	4.0' EMGEL250 -2.75
Pounds per Hole	<u>84.57 lbs</u>		Bottom Load:	2.0' Stemming Stone
Total Est. Pounds	<u>4228.36 lbs</u>			
Powder Factor	<u>1.24 lbs/CY</u>			
Decks	<u>1</u>	Dry Load:	7.5' PELLITE (ANFO)	
		Wet Load:	4.0' EMGEL250 -2.75	
		Bottom Load:	1.0' POWER PRIMER	

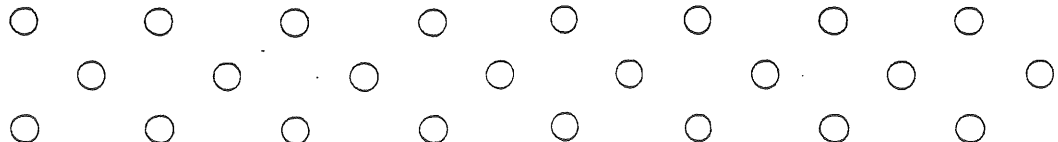
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>300</u>	Distance to Structure
lbs per Delay (w)	<u>42.28</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>46.14</u>	( sd = d / square root of w )
Estimated PPV	<u>0.35</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 300' from a structure utilizing 3.5" diameter at a 7' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



Haley & Aldrich, Inc.  
465 Medford Street  
Suite 2200  
Boston, MA 02129-1400  
Tel: 617.886.7400  
Fax: 617.886.7600  
Email: BOS@HaleyAldrich.com



MEMORANDUM

7 July 1999  
File No. 19441-000

TO: Kleinschmidt Associates  
Leslie Corrow

C: H&A  
Jim Weaver

FROM: Haley & Aldrich, Inc.  
Andrew F. McKown, P.E. *AM*

SUBJECT: Blast Vibration Standards  
Proposed New Quarry  
Portland, ME

Attached are two figures which summarize the vibration limits for (a) the Portland Zoning Ordinance, and (b) the Maine DEP Performance Standards for Quarries. You asked that we summarize and present the limits in an understandable format and compare the limits to something a layman could relate to.

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Figure 1 presents the Portland Zoning Ordinance limits as well as the two options provided for in the Maine DEP standards. Figure two presents the same limits and also compares the limits to some everyday household vibrations people may feel, as well as to the perceptibility limits for humans. Some comments on the U.S. Bureau of Mines safe limits and what they mean follow, along with some other pertinent findings from U.S. Bureau of Mines research.

Between about 1960 and 1997, the U.S. Bureau of Mines conducted extensive research into the effects of blasting on residential structures, and concluded several things: (1) The best vibration criterion for predicting whether blasting vibrations might damage homes is peak particle velocity of ground motion. Peak particle velocity is the speed at which the ground moves up and down (or back and forth) when elastic vibration waves travel by. (2) Safe levels of ground vibration from blasting range between 0.5 and 2.0 inches per second (ips) peak particle velocity for residential-type structures, depending on the type of construction and frequency of blast vibrations (see Figure 1). The frequency of ground vibration is the number of elastic vibration waves which pass by in a given unit of time, measured in cycles

Kleinschmidt Associates

6 July 1999

Page 2

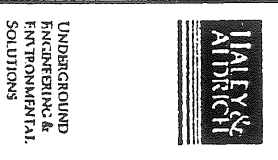
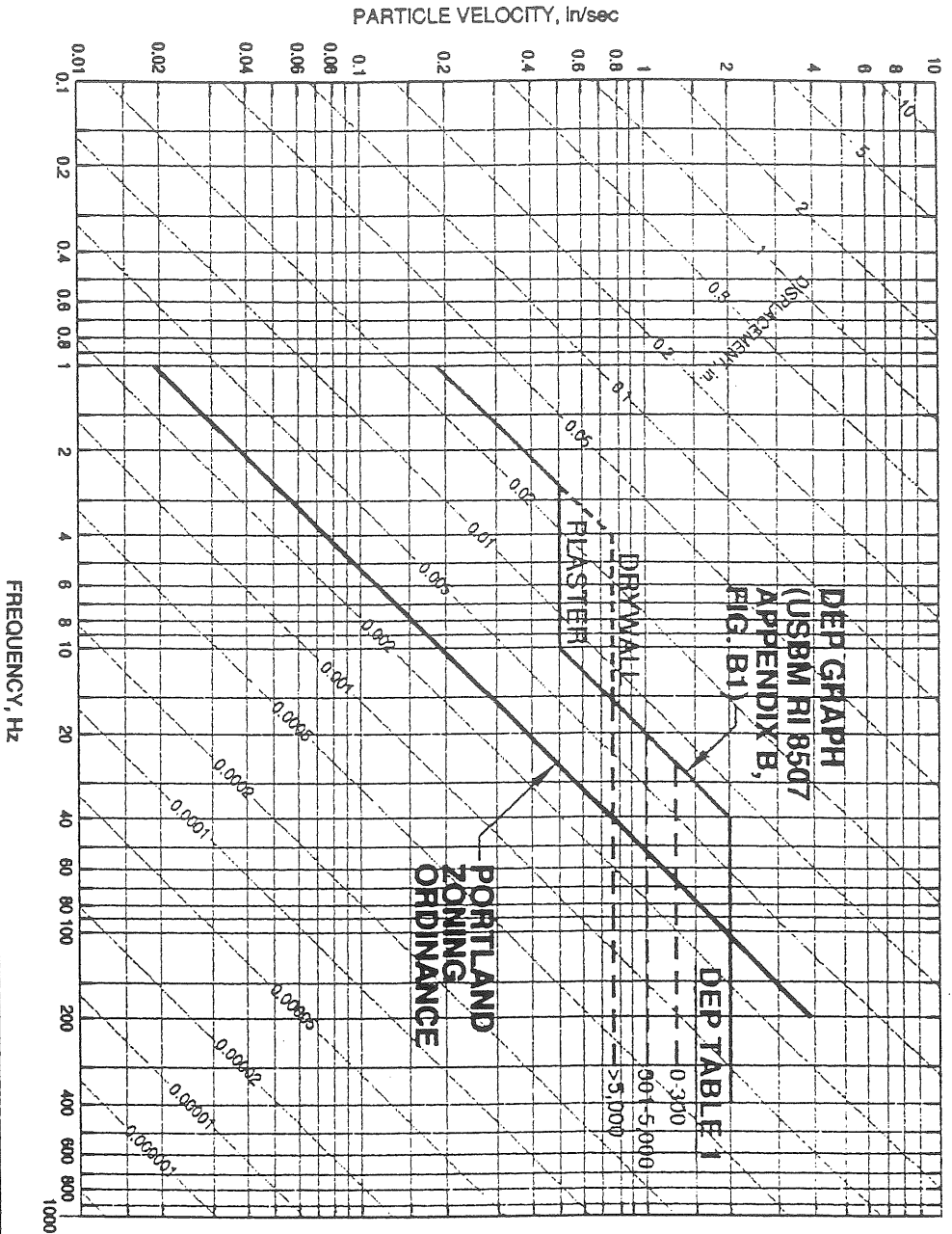
per second, or Hertz (Hz). The lowest limits (0.5 ips for plaster walls and 0.75 ips for drywall construction) are for low frequency vibrations (less than 10 to 15 Hz), where the ground vibrations are near the resonant frequencies of residential type structures and can result in amplification of the vibrations on the upper floors of the structures. (3) The safe limits are to protect against cosmetic damage to residential structures, such as hairline cracking in plaster walls or gypsum drywall. (4) The safe limits are based on a less than 5% probability of cosmetic damage. Therefore if the limits are slightly exceeded, it does not mean damage has occurred, only that the probability of damage is greater than about 5%. (5) People can feel vibrations at levels which are well below (10 to 100 times less than) levels which might cause cosmetic damage (see Figure 2). (6) Normal everyday events in homes (such as door slamming, jumping, and changes in humidity and temperature) can cause stresses and strains in the structures equivalent to the strains produced by ground vibrations of 0.3 to 3.0 ips.

We hope these figures and comments assist you in your work. Please call if you have any questions or require more information.

Attachments

C:\files\word\klnmemo.doc





PREPARED FOR KLEINSCHMIDT ASSOCIATES

COMPARISON OF VIBRATION LIMITS  
MAINE DEP QUARRY REGULATIONS  
VS. PORTLAND ZONING ORDINANCE

SCALE: AS SHOWN

JULY 1990

FIGURE 1

19441-000 A02

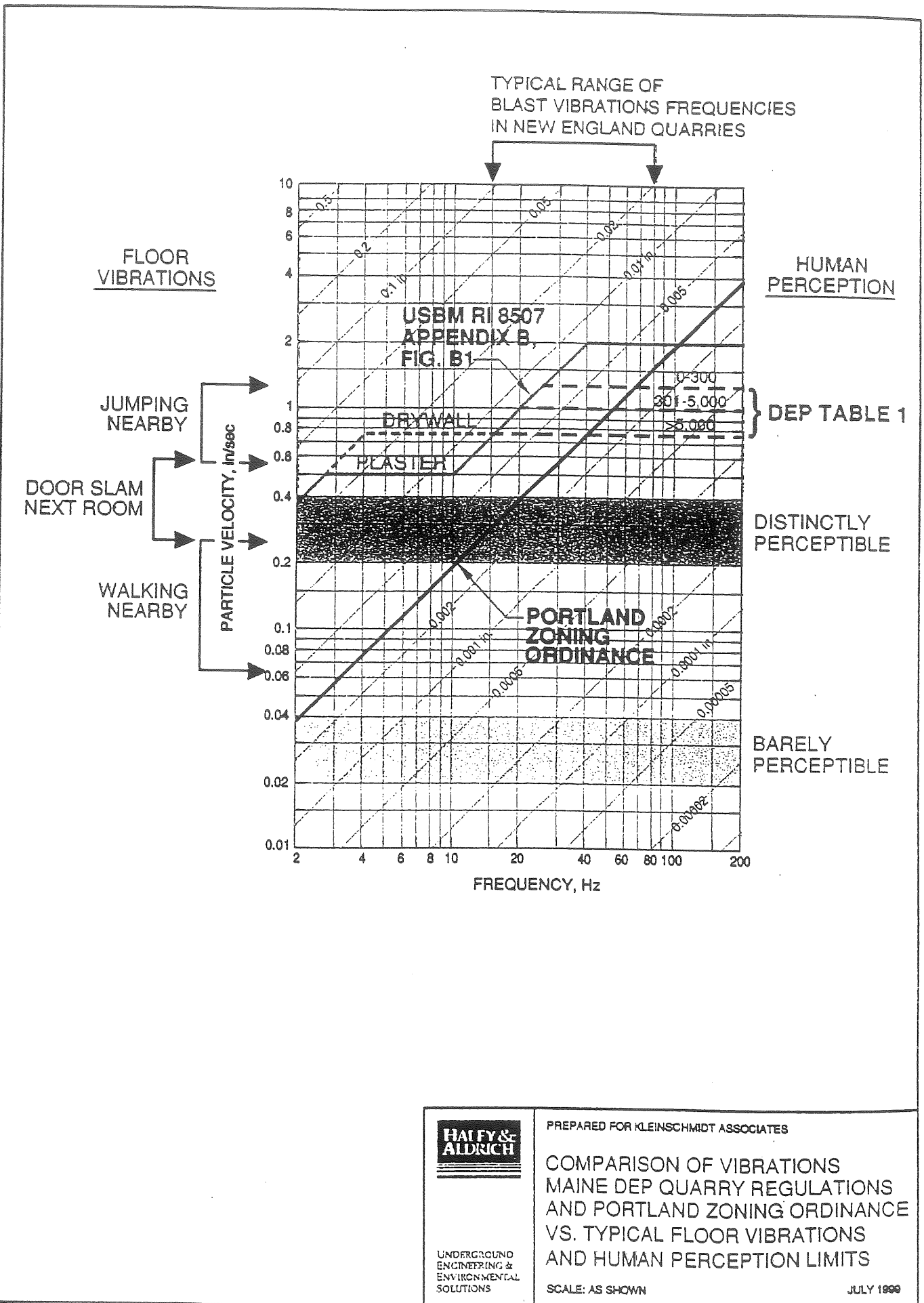


FIGURE 2



**Jacques Whitford  
Company, Inc.**

Consulting Engineers  
Environmental Scientists  
Risk Consultants

75 Pearl Street, Suite 201, Portland, Maine, U.S.A. 04101  
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World Wide Web: [www.jacqueswhitford.com](http://www.jacqueswhitford.com)  
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October 17, 2001

Mr. Dave Grinnell  
Dragon Products Company  
38 Preble Street  
P.O. Box 1521  
Portland, Maine 04104

Re: Probability of Damage Assessment, Proposed Quarry Expansion, Ocean Avenue Quarry,  
Portland, Maine

Dear Mr. Grinnell:

Jacques Whitford Company, Inc. (JWC) is pleased to provide this report regarding Dragon Products Company's (Dragon) proposed quarry expansion project in Portland, Maine. This report provides clarification of information we provided in our report to Dragon dated July 18, 2001.

JWC understands that the Maine Department of Environmental Protection's (MDEP) Quarry Performance Standard peak particle velocity limit of 1 inch/sec would apply to the Dragon quarry expansion. Based on US Bureau of Mines research<sup>1,2</sup>, a peak particle velocity of 1 inch/sec corresponds to a probability of damage on the order of 1 percent. Therefore, the estimated 400 blast events proposed for the quarry could result in up to 4 incidents of damage where residences are subjected to peak particle velocities of 1 ips. In the context of this research, the threshold of damage was defined as "cosmetic damage of the most superficial type, of interior cracking that develops in all homes, independent of blasting."<sup>1</sup> Thus, even if 4 incidents of damage should occur over the 20 to 30 year period of quarry operations, the type of damage is likely to be very minor, and cosmetic in nature.

The City of Portland has further reduced the peak particle velocity target for the Ocean Avenue site to a limit of 0.75. Based on studies of blasting by the US Bureau of Mines, no blast-induced damage (*i.e.*, zero percent probability) was observed at particle velocities below 0.75 ips<sup>1</sup>.



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Mr. Dave Grinnell  
October 17, 2001  
Page 2

At the relatively low particle velocities allowed by MDEP and the City of Portland, and the limited number of blast events proposed by Dragon, the probability of damage from each blast event is independent (*i.e.*, not cumulative). Research has shown that damage associated with long-term fatigue is likely to occur only at relatively high vibration levels, or after thousands of blast events<sup>2</sup>. For example, vibration tests by the US Army Corp. of Engineers' Civil Engineering Research Laboratory indicated damage to a test room only after 2,669 vibration events and a vibration level of 4.0 ips<sup>2</sup>. Other tests run at a lower particle velocity of about 0.5 ips indicated damage to a wood frame house only after the equivalent of about 20,000 blast events<sup>2</sup>. The damage observed was a cracked wall-board tape joint.

It is reasonable to conclude that if blast events are managed as anticipated, no damage to homes in the vicinity of the quarry would occur. Please do not hesitate to contact us if you have any questions or require additional information. JWC appreciates the opportunity to assist Dragon Products Company.

Sincerely,  
Jacques Whitford Company, Inc.



D. Todd Coffin, C.G.  
Senior Environmental Geologist

MEP00123\probability 10 17 01

<sup>1</sup> Charles H. Dowding, "Blast Vibration Monitoring and Control," Northwestern University, 1985.

<sup>2</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.







**Jacques Whitford  
Company, Inc.**

75 Pearl Street, Suite 201, Portland, Maine, U.S.A. 04101  
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Environmental Scientists  
Risk Consultants

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November 8, 2000

Mr. Dave Grinnell  
Dragon Products Company  
38 Preble Street  
P.O. Box 1521  
Portland, Maine 04104

Re: Report on Geologic Assessment of Proposed Quarry Expansion, Ocean Avenue Quarry,  
Portland, Maine

Dear Mr. Grinnell:

Jacques Whitford Company, Inc. (JWC) is pleased to provide this report on a geologic assessment of the proposed Dragon Products Company expansion of the Ocean Avenue Quarry in Portland, Maine. In accordance with our proposal dated July 25, 2000, JWC evaluated the proposed quarry expansion relative to the following concerns expressed by area citizens:

1. Blasting rock may result in the release and migration of groundwater contaminants from the closed Ocean Avenue Landfill to area properties.
2. Blasting rock may result in increased radon levels at area properties.
3. Blasting may damage natural gas pipelines or result in natural gas line explosions.
4. Repeated blasting may cause longer-term structural fatigue and damage to homes.

### **Project Location and Background**

The Dragon Products Company quarry is located west of Ocean Avenue, just north of Graves Hill in Portland, Maine. Site location plans are shown on Figures 1 and 2. The site is bounded to the north and south by undeveloped woods and residential property, to the east by Ocean Avenue, and to the west by the former City of Portland Ocean Avenue Landfill. Undeveloped woods and residential properties lie east of the quarry, across Ocean Avenue.



Geotechnical Engineering • Materials Engineering • Mining Engineering • Petroleum Engineering • Air Quality • Environmental Sciences  
Environmental Engineering • Hydrogeology • Environmental Management Systems • Integrated Risk Management Services

The rock quarry consists of about 20 acres, and has been in operation for over 70 years<sup>2</sup>. Construction of the existing garage and offices at the site were completed around 1939. Production of concrete at the site began in the 1940's.

Dragon Products Company is proposing improvements to the property, and limited expansion of the rock quarry. Improvements include relocation of the concrete production building and cement silo away from Ocean Avenue (towards the interior of the existing quarry), construction of a vegetated earthen berm along Ocean Avenue, construction of a new paved entrance north of the existing entrance, and addition of a climbing lane on Ocean Avenue. Removal of rock will be accomplished with a maximum of 20 rock blast events per year. Blasting will be conducted in accordance with a blast design plan that helps assure safe and efficient removal of the rock resource.

## Findings

The findings of our assessment are detailed below. Concerns raised by area citizens are discussed individually under the headings presented in the opening paragraph of this letter.

1. *Blasting rock may result in the release and migration of groundwater contaminants from the closed Ocean Avenue Landfill to area properties.*

The City of Portland Ocean Avenue landfill reportedly operated for approximately 20 years until its closure in 1978.<sup>1</sup> In 1987, the City of Portland installed bedrock monitoring wells around the perimeter of the landfill. Sampling of groundwater from the bedrock wells between 1987 and 1994 indicated slightly elevated concentrations of hardness, specific conductance, calcium, iron, magnesium, manganese and potassium.<sup>2</sup> In a letter to the City of Portland dated June 11, 1996, Sebago Technics reported that the water quality data between 1987 and 1994 remained relatively constant, and created "no observable health risks." Properties in the area surrounding the former landfill are served by public water provided by the Portland Water District.

The City of Portland is presently completing closure of the landfill in accordance with criteria established by the Maine Department of Environmental Protection (MDEP). Installation of a landfill cover is substantially complete, and a fence has been erected to help prevent unauthorized access.

JWC reviewed the proposed Dragon Products Company blast design plan to evaluate whether blasting would result in the release and migration of groundwater contaminants at the landfill. The blast design plan, prepared by Maine Drilling & Blasting, Inc., specifies controlled blasting using timed delays and requirements for blast hole diameter, depth, spacing, and charge weight,

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<sup>1</sup> Haley & Aldrich, Inc., "Report on Oil and Hazardous Material Site Evaluation, Cook Concrete Property, Portland, Maine," February, 1991.

<sup>2</sup> Sebago Technics, "City of Portland - Ocean Avenue Landfill," June 11, 1996.



among others (refer to Appendix A). Given the parameters proposed in the blast design plan, a peak particle velocity (a measure of seismic vibration) of about 4.8 inches per second (ips) is estimated for the portion of the landfill closest to the proposed quarry expansion area. Dragon Products Company provides a buffer of at least 100 feet between the proposed quarry expansion area and the landfill.

The estimated particle velocity at the landfill is well below that which would result in fracturing of bedrock. Therefore, the risk of release and migration of contaminants through air, soils or water, as a result of blast-induced fractures at the landfill, is low. For example, researchers have identified a conservative lower limit for cracking of granite at a seismic velocity of 28 ips.<sup>3</sup> Other sources report that the radius of rock fracturing around a blast hole is limited to a radius of 20 to 40 blast-hole diameters.<sup>4</sup> Based on this guidance, the zone of rock fracturing beyond the quarry expansion area would be limited to about 13 feet. The relatively low particle velocities estimated for the landfill site are also unlikely to cause damage (such as opening of fissures) to the landfill cover.

In summary, previous reports indicate that the former City of Portland Ocean Avenue Landfill has had some impact on groundwater quality, but not at concentrations that pose a significant threat to human health or the environment at area properties. Due to the relatively low seismic velocities estimated by Maine Drilling & Blasting, Inc., the risk that blasting at the proposed quarry expansion will significantly impact water quality at the former landfill, or at properties in the former landfill vicinity, is low. Maine Drilling & Blasting has prepared a blast design plan to minimize the effects of blasting at the site and in the site vicinity.

*2. Blasting rock may result in increased radon levels at area properties.*

Discussions with Robert Stillwell of the Maine Radiation Control Program indicate numerous incidences of high radon levels at homes in the vicinity of the proposed Dragon Products Company quarry expansion.<sup>5</sup> Radon is a naturally-occurring radioactive gas that originates in rock and sediment. Radon can be present in homes as a result of migration from bedrock fractures and pore space in sediments. At certain concentrations, radon poses a health risk.

JWC reviewed the Maine Drilling & Blasting, Inc., blast plan for the proposed quarry expansion to evaluate the potential for the release of radon to area properties as a result of rock blasting. The blast plan provides estimated peak particle velocities at distances ranging from 300 to 600 feet from the quarry expansion boundary. The closest residence is about 300 feet from the quarry expansion boundary. The estimated peak particle velocities reported by Maine Drilling & Blasting, Inc., range from 0.27 to 0.52 ips.

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<sup>3</sup> Charles H. Dowding, "Blast Vibration Monitoring and Control," Northwestern University, 1985.

<sup>4</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.

<sup>5</sup> Robert Stillwell, Letter to Ann Elderkin, P.A., City of Portland, regarding radon levels in the Portland area, dated April 15, 1999.



The predicted range of seismic velocities at area residences is at least 50 times lower than that required to fracture crystalline bedrock.<sup>3</sup> As a result, the closest residence, located about 300 feet from the quarry expansion boundary, is well beyond the predicted zone of bedrock fracturing. As reported earlier in this report, the zone of rock fracturing is limited to a radius of about 13 feet from each blast hole. Based on this data, the risk that blasting at the proposed quarry expansion area will result in the release of radon to homes or other structures as a result of rock fracturing, is negligible. Blast-induced vibration of rock and sediment alone would not result in a significant release of radon given the relatively low particle velocities predicted, and the short duration of blast events.

In summary, while high radon levels have been reported in the vicinity of the proposed quarry expansion area, the risk that blasting of bedrock and associated vibrations will result in a significant release of radon, is negligible. This finding is based on the low vibration levels predicted for the surrounding areas as detailed in the blast design plan by Maine Drilling & Blasting, Inc. (Appendix A).

*3. Blasting may damage natural gas pipelines or result in natural gas line explosions.*

JWC contacted Northern Utilities, Inc., to identify natural gas pipelines in the vicinity of the proposed quarry expansion area. Pipeline maps provided by Northern Utilities indicate the closest gas lines to the quarry are located at the Wellstone Condominium complex, about 1,800 feet south of the southernmost quarry expansion boundary. Based on this distance and the blast plan data provided by Maine Drilling & Blasting, Inc., JWC calculated a peak particle velocity of 0.05 ips. This low particle velocity is substantially below the United States Bureau of Mines "safe" particle velocity of 2.0 ips.<sup>6</sup> The threshold for damage, defined as the development of cracks in plaster, is generally considered to occur at a velocity of 2.0 ips.

Given the considerable distance from the proposed quarry expansion area to the nearest natural gas pipeline, JWC finds that the risk of damage to this pipeline, as a result of blasting at the quarry, is negligible. The predicted vibration levels at the pipeline are about 40 times less than the damage threshold for structures of 2.0 ips.

*4. Repeated blasting may cause longer-term structural fatigue and damage to homes.*

JWC evaluated the potential for repeated blasting events to result in damage to off-site structures due to structural fatigue. A number of studies have been undertaken by the United States Bureau of Mines and others to assess the effects of repeated blasting on structures.<sup>6</sup> For example, the Bureau of Mines subjected a wood frame house, located an estimated 100 to 200 feet from a mine, to 587 production blasts, after which it was mechanically shaken to determine the threshold for fatigue cracking. The first crack appeared after the equivalent of 28 years of

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<sup>6</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.



blasting, twice a day, at a vibration level of 0.5 ips. The reported damage consisted of a cracked wall board tape joint.<sup>6</sup>

Studies of the effects of repeated low-level vibrations from blasting indicate little potential for damage to structures. Reports indicate that particle velocities approaching 2.0 ips are required to create damage under repeated blasting scenarios; the predicted range of particle velocities for properties in the vicinity of the quarry expansion is 0.27 to 0.52 ips. As stated earlier in this report, 2.0 ips is commonly cited as the threshold for damage during a single blast event.

### Conclusions

The Dragon Products Company quarry on Ocean Avenue has been in operation for over 70 years. Dragon is proposing improvements to the property and limited expansion of rock quarry operations that will involve a maximum of 20 blast events per year. Area residents have expressed concerns over the impacts of rock blasting, including the potential for the release of contaminants from the closed City of Portland Ocean Avenue Landfill, release of radon at area residences, damage to natural gas pipelines, and structural damage to buildings due to repeated blasting events.

Maine Drilling & Blasting, Inc., has prepared a site-specific blast design plan that specifies controlled blasting using timed delays and requirements for blast hole diameter, depth, spacing, and charge weight, among others. JWC has reviewed this plan relative to each of the concerns expressed by the area citizens. JWC concludes that the risk of impacts to the neighborhood for each area of concern is low. This finding is based on the substantial distance of off-site buildings and natural gas pipelines from the quarry, the relatively low predicted blast-induced vibrations beyond the quarry expansion area, and scientific data on the impacts of blasting gathered by researchers, including the United States Bureau of Mines.

### Closure

JWC's findings are based solely on the scope of work conducted and sources of information referenced in this report. Any additional information that becomes available concerning this site should be provided to us so that our conclusions may be reviewed and modified, if necessary. Our work has been undertaken in accordance with generally accepted consulting engineering practices. No other warranty, expressed or implied, is made.



Mr. Dave Grinnell  
November 8, 2000  
Page 6

Please feel free to contact us should you have any questions regarding this report.

Sincerely,  
Jacques Whitford Company, Inc.



D. Todd Coffin, C.G.  
Senior Environmental Geologist

Figure 1 Dragon Products Quarry, Portland, ME  
Figure 2 Site Plan  
Appendix A Blast Design Plan

MEP00123\rept1



**APPENDIX A**  
**BLAST DESIGN PLAN**



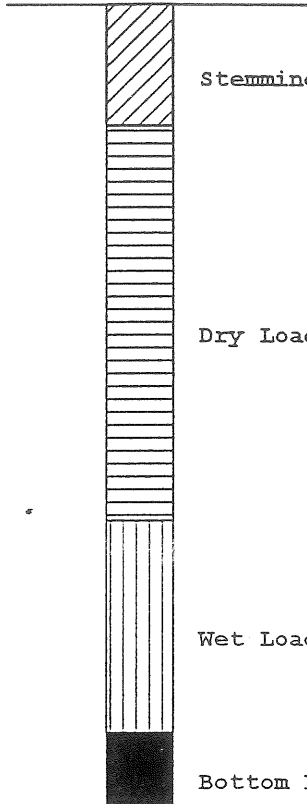




MAINE DRILLING AND BLASTING, INC.

Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 450 Feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>		Stemming:	5.0' Stemming Stone
Depth	<u>33'</u>			
Hole Diameter	<u>4.0"</u>			
Burden	<u>8'</u>			
Spacing	<u>9'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>124.70 lbs</u>		Dry Load:	16.3' PELLITE (ANFO)
Pounds per Hole	<u>124.70 lbs</u>			
Total Est. Pounds	<u>6234.95 lbs</u>			
Powder Factor	<u>1.42 lbs/CY</u>			
Decks	<u>0</u>			
			Wet Load:	8.8' EXTRA 1300 3"
			Bottom Load:	3.0' SLURRAN 430 3"

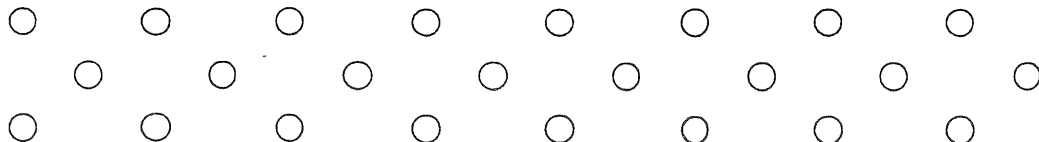
Blast Plan Notes  
 4 inch diameter hole

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>450</u>	Distance to Structure
lbs per Delay (w)	<u>124.70</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>40.30</u>	( sd = d / square root of w )
Esimated PPV	<u>0.43</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 450' from a structure utilizing 4.0" diameter at a 8' by 9' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



M A I N E D R I L L I N G A N D B L A S T I N G , I N C .

Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 400 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming Stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>8'</u>			
Spacing	<u>8'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>94.64 lbs</u>		Dry Load:	16.9' PELLITE (ANFO)
Pounds per Hole	<u>94.64 lbs</u>			
Total Est. Pounds	<u>4732.20 lbs</u>			
Powder Factor	<u>1.21 lbs/CY</u>			
Decks	<u>0</u>			
			Wet Load:	9.1' EMGEL250 -2.75
			Bottom Load:	2.0' POWER PRIMER

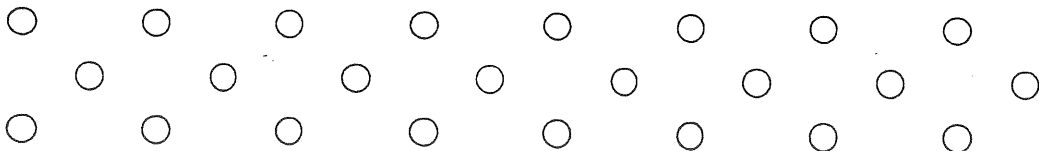
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>400</u>	Distance to Structure
lbs per Delay (w)	<u>94.64</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>41.12</u>	( $sd = d / \text{square root of } w$ )
Esimated PPV	<u>0.42</u>	( $ppv = k * sd ^ - 1.6$ )

Typical for production work consistent holes 33' deep at 400' from a structure utilizing 3.5" diameter at a 8' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



MAINE DRILLING AND BLASTING, INC.

Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 350 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming Stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>8'</u>			
Spacing	<u>8'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>94.64 lbs</u>		Dry Load:	16.9' PELLITE (ANFO)
Pounds per Hole	<u>94.64 lbs</u>			
Total Est. Pounds	<u>4732.20 lbs</u>			
Powder Factor	<u>1.21 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	9.1' EMGEL250 -2.75	
		Bottom Load:	2.0' POWER PRIMER	

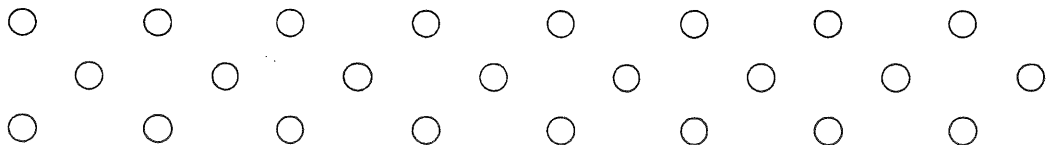
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>350</u>	Distance to Structure
lbs per Delay (w)	<u>94.64</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>35.98</u>	( sd = d / square root of w )
Esimated PPV	<u>0.52</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 350' from a structure utilizing 3.5" diameter at a 8' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



M A I N E D R I L L I N G A N D B L A S T I N G , I N C .

Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting w/deck at 300 feet

APENDIX A.

Blast Design Plan					
Est. # of Holes	<u>50</u>		Stemming:	6.0'	Stemming Stone
Depth	<u>33'</u>		Dry Load:	7.5'	PELLITE (ANFO)
Hole Diameter	<u>3.5"</u>		Wet Load:	4.0'	EMGEL250 -2.75
Burden	<u>7'</u>		Bottom Load Stemming:	2.0'	POWER PRIMER Stemming Stone
Spacing	<u>8'</u>		Dry Load:	7.5'	PELLITE (ANFO)
Holes per Delay	<u>1</u>		Wet Load:	4.0'	EMGEL250 -2.75
Pounds per Delay	<u>42.28 lbs</u>		Bottom Load:	1.0'	POWER PRIMER
Pounds per Hole	<u>84.57 lbs</u>				
Total Est. Pounds	<u>4228.36 lbs</u>				
Powder Factor	<u>1.24 lbs/CY</u>				
Decks	<u>1</u>				

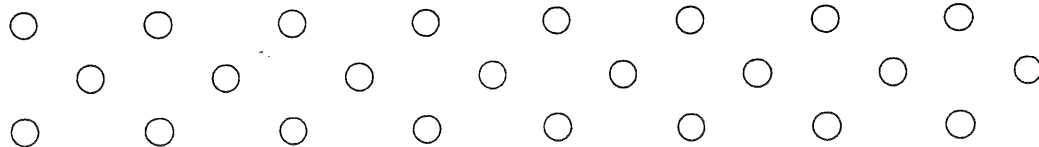
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>300</u>	Distance to Structure
lbs per Delay (w)	<u>42.28</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>46.14</u>	( sd = d / square root of w )
Esimated PPV	<u>0.35</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 300' from a structure utilizing 3.5" diameter at a 7' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )





**Jacques Whitford  
Company, Inc.**

75 Pearl Street, Suite 201, Portland, Maine, U.S.A. 04101  
Tel 207 761 7790 Fax 207 772 0385

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Environmental Scientists  
Risk Consultants

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November 8, 2000

Mr. Dave Grinnell  
Dragon Products Company  
38 Preble Street  
P.O. Box 1521  
Portland, Maine 04104

Re: Report on Geologic Assessment of Proposed Quarry Expansion, Ocean Avenue Quarry,  
Portland, Maine

Dear Mr. Grinnell:

Jacques Whitford Company, Inc. (JWC) is pleased to provide this report on a geologic assessment of the proposed Dragon Products Company expansion of the Ocean Avenue Quarry in Portland, Maine. In accordance with our proposal dated July 25, 2000, JWC evaluated the proposed quarry expansion relative to the following concerns expressed by area citizens:

1. Blasting rock may result in the release and migration of groundwater contaminants from the closed Ocean Avenue Landfill to area properties.
2. Blasting rock may result in increased radon levels at area properties.
3. Blasting may damage natural gas pipelines or result in natural gas line explosions.
4. Repeated blasting may cause longer-term structural fatigue and damage to homes.

### **Project Location and Background**

The Dragon Products Company quarry is located west of Ocean Avenue, just north of Graves Hill in Portland, Maine. Site location plans are shown on Figures 1 and 2. The site is bounded to the north and south by undeveloped woods and residential property, to the east by Ocean Avenue, and to the west by the former City of Portland Ocean Avenue Landfill. Undeveloped woods and residential properties lie east of the quarry, across Ocean Avenue.



*Geotechnical Engineering • Materials Engineering • Mining Engineering • Petroleum Engineering • Air Quality • Environmental Sciences  
Environmental Engineering • Hydrogeology • Environmental Management Systems • Integrated Risk Management Services*

The rock quarry consists of about 20 acres, and has been in operation for over 70 years<sup>2</sup>. Construction of the existing garage and offices at the site were completed around 1939. Production of concrete at the site began in the 1940's.

Dragon Products Company is proposing improvements to the property, and limited expansion of the rock quarry. Improvements include relocation of the concrete production building and cement silo away from Ocean Avenue (towards the interior of the existing quarry), construction of a vegetated earthen berm along Ocean Avenue, construction of a new paved entrance north of the existing entrance, and addition of a climbing lane on Ocean Avenue. Removal of rock will be accomplished with a maximum of 20 rock blast events per year. Blasting will be conducted in accordance with a blast design plan that helps assure safe and efficient removal of the rock resource.

### Findings

The findings of our assessment are detailed below. Concerns raised by area citizens are discussed individually under the headings presented in the opening paragraph of this letter.

1. *Blasting rock may result in the release and migration of groundwater contaminants from the closed Ocean Avenue Landfill to area properties.*

The City of Portland Ocean Avenue landfill reportedly operated for approximately 20 years until its closure in 1978.<sup>1</sup> In 1987, the City of Portland installed bedrock monitoring wells around the perimeter of the landfill. Sampling of groundwater from the bedrock wells between 1987 and 1994 indicated slightly elevated concentrations of hardness, specific conductance, calcium, iron, magnesium, manganese and potassium.<sup>2</sup> In a letter to the City of Portland dated June 11, 1996, Sebago Technics reported that the water quality data between 1987 and 1994 remained relatively constant, and created "no observable health risks." Properties in the area surrounding the former landfill are served by public water provided by the Portland Water District.

The City of Portland is presently completing closure of the landfill in accordance with criteria established by the Maine Department of Environmental Protection (MDEP). Installation of a landfill cover is substantially complete, and a fence has been erected to help prevent unauthorized access.

JWC reviewed the proposed Dragon Products Company blast design plan to evaluate whether blasting would result in the release and migration of groundwater contaminants at the landfill. The blast design plan, prepared by Maine Drilling & Blasting, Inc., specifies controlled blasting using timed delays and requirements for blast hole diameter, depth, spacing, and charge weight,

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<sup>1</sup> Haley & Aldrich, Inc., "Report on Oil and Hazardous Material Site Evaluation, Cook Concrete Property, Portland, Maine," February, 1991.

<sup>2</sup> Sebago Technics, "City of Portland - Ocean Avenue Landfill," June 11, 1996.



among others (refer to Appendix A). Given the parameters proposed in the blast design plan, a peak particle velocity (a measure of seismic vibration) of about 4.8 inches per second (ips) is estimated for the portion of the landfill closest to the proposed quarry expansion area. Dragon Products Company provides a buffer of at least 100 feet between the proposed quarry expansion area and the landfill.

The estimated particle velocity at the landfill is well below that which would result in fracturing of bedrock. Therefore, the risk of release and migration of contaminants through air, soils or water, as a result of blast-induced fractures at the landfill, is low. For example, researchers have identified a conservative lower limit for cracking of granite at a seismic velocity of 28 ips.<sup>3</sup> Other sources report that the radius of rock fracturing around a blast hole is limited to a radius of 20 to 40 blast-hole diameters.<sup>4</sup> Based on this guidance, the zone of rock fracturing beyond the quarry expansion area would be limited to about 13 feet. The relatively low particle velocities estimated for the landfill site are also unlikely to cause damage (such as opening of fissures) to the landfill cover.

In summary, previous reports indicate that the former City of Portland Ocean Avenue Landfill has had some impact on groundwater quality, but not at concentrations that pose a significant threat to human health or the environment at area properties. Due to the relatively low seismic velocities estimated by Maine Drilling & Blasting, Inc., the risk that blasting at the proposed quarry expansion will significantly impact water quality at the former landfill, or at properties in the former landfill vicinity, is low. Maine Drilling & Blasting has prepared a blast design plan to minimize the effects of blasting at the site and in the site vicinity.

*2. Blasting rock may result in increased radon levels at area properties.*

Discussions with Robert Stillwell of the Maine Radiation Control Program indicate numerous incidences of high radon levels at homes in the vicinity of the proposed Dragon Products Company quarry expansion.<sup>5</sup> Radon is a naturally-occurring radioactive gas that originates in rock and sediment. Radon can be present in homes as a result of migration from bedrock fractures and pore space in sediments. At certain concentrations, radon poses a health risk.

JWC reviewed the Maine Drilling & Blasting, Inc., blast plan for the proposed quarry expansion to evaluate the potential for the release of radon to area properties as a result of rock blasting. The blast plan provides estimated peak particle velocities at distances ranging from 300 to 600 feet from the quarry expansion boundary. The closest residence is about 300 feet from the quarry expansion boundary. The estimated peak particle velocities reported by Maine Drilling & Blasting, Inc., range from 0.27 to 0.52 ips.

<sup>3</sup> Charles H. Dowding, "Blast Vibration Monitoring and Control," Northwestern University, 1985.

<sup>4</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.

<sup>5</sup> Robert Stillwell, Letter to Ann Elderkin, P.A., City of Portland, regarding radon levels in the Portland area, dated April 15, 1999.



The predicted range of seismic velocities at area residences is at least 50 times lower than that required to fracture crystalline bedrock.<sup>3</sup> As a result, the closest residence, located about 300 feet from the quarry expansion boundary, is well beyond the predicted zone of bedrock fracturing. As reported earlier in this report, the zone of rock fracturing is limited to a radius of about 13 feet from each blast hole. Based on this data, the risk that blasting at the proposed quarry expansion area will result in the release of radon to homes or other structures as a result of rock fracturing, is negligible. Blast-induced vibration of rock and sediment alone would not result in a significant release of radon given the relatively low particle velocities predicted, and the short duration of blast events.

In summary, while high radon levels have been reported in the vicinity of the proposed quarry expansion area, the risk that blasting of bedrock and associated vibrations will result in a significant release of radon, is negligible. This finding is based on the low vibration levels predicted for the surrounding areas as detailed in the blast design plan by Maine Drilling & Blasting, Inc. (Appendix A).

*3. Blasting may damage natural gas pipelines or result in natural gas line explosions.*

JWC contacted Northern Utilities, Inc., to identify natural gas pipelines in the vicinity of the proposed quarry expansion area. Pipeline maps provided by Northern Utilities indicate the closest gas lines to the quarry are located at the Wellstone Condominium complex, about 1,800 feet south of the southernmost quarry expansion boundary. Based on this distance and the blast plan data provided by Maine Drilling & Blasting, Inc., JWC calculated a peak particle velocity of 0.05 ips. This low particle velocity is substantially below the United States Bureau of Mines "safe" particle velocity of 2.0 ips.<sup>6</sup> The threshold for damage, defined as the development of cracks in plaster, is generally considered to occur at a velocity of 2.0 ips.

Given the considerable distance from the proposed quarry expansion area to the nearest natural gas pipeline, JWC finds that the risk of damage to this pipeline, as a result of blasting at the quarry, is negligible. The predicted vibration levels at the pipeline are about 40 times less than the damage threshold for structures of 2.0 ips.

*4. Repeated blasting may cause longer-term structural fatigue and damage to homes.*

JWC evaluated the potential for repeated blasting events to result in damage to off-site structures due to structural fatigue. A number of studies have been undertaken by the United States Bureau of Mines and others to assess the effects of repeated blasting on structures.<sup>6</sup> For example, the Bureau of Mines subjected a wood frame house, located an estimated 100 to 200 feet from a mine, to 587 production blasts, after which it was mechanically shaken to determine the threshold for fatigue cracking. The first crack appeared after the equivalent of 28 years of

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<sup>6</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.





blasting, twice a day, at a vibration level of 0.5 ips. The reported damage consisted of a cracked wall board tape joint.<sup>6</sup>

Studies of the effects of repeated low-level vibrations from blasting indicate little potential for damage to structures. Reports indicate that particle velocities approaching 2.0 ips are required to create damage under repeated blasting scenarios; the predicted range of particle velocities for properties in the vicinity of the quarry expansion is 0.27 to 0.52 ips. As stated earlier in this report, 2.0 ips is commonly cited as the threshold for damage during a single blast event.

### Conclusions

The Dragon Products Company quarry on Ocean Avenue has been in operation for over 70 years. Dragon is proposing improvements to the property and limited expansion of rock quarry operations that will involve a maximum of 20 blast events per year. Area residents have expressed concerns over the impacts of rock blasting, including the potential for the release of contaminants from the closed City of Portland Ocean Avenue Landfill, release of radon at area residences, damage to natural gas pipelines, and structural damage to buildings due to repeated blasting events.

Maine Drilling & Blasting, Inc., has prepared a site-specific blast design plan that specifies controlled blasting using timed delays and requirements for blast hole diameter, depth, spacing, and charge weight, among others. JWC has reviewed this plan relative to each of the concerns expressed by the area citizens. JWC concludes that the risk of impacts to the neighborhood for each area of concern is low. This finding is based on the substantial distance of off-site buildings and natural gas pipelines from the quarry, the relatively low predicted blast-induced vibrations beyond the quarry expansion area, and scientific data on the impacts of blasting gathered by researchers, including the United States Bureau of Mines.

### Closure

JWC's findings are based solely on the scope of work conducted and sources of information referenced in this report. Any additional information that becomes available concerning this site should be provided to us so that our conclusions may be reviewed and modified, if necessary. Our work has been undertaken in accordance with generally accepted consulting engineering practices. No other warranty, expressed or implied, is made.



Mr. Dave Grinnell  
November 8, 2000  
Page 6

Please feel free to contact us should you have any questions regarding this report.

Sincerely,  
Jacques Whitford Company, Inc.



D. Todd Coffin, C.G.  
Senior Environmental Geologist

Figure 1 Dragon Products Quarry, Portland, ME

Figure 2 Site Plan

Appendix A Blast Design Plan

MEP00123\rept1





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Mag 14.00  
 Wed Nov 08 14:54 2000  
 Scale 1:31,250 (at center)  
 2000 Feet  
 1000 Meters

- |  |                           |  |                    |
|--|---------------------------|--|--------------------|
|  | Local Road                |  | Railroad           |
|  | Major Connector           |  | Point of Interest  |
|  | State Route               |  | Summit             |
|  | Interstate/Limited Access |  | Geographic Feature |
|  | Toll Highway              |  | Park/Reservation   |
|  | US Highway                |  | Locale             |
|  | Exit                      |  | Cemetery           |

Figure 1 Dragon Products Quarry, Portland, ME

APPENDIX A  
BLAST DESIGN PLAN



Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 600 Feet

APENDIX A.

Blast Design Plan			
Est. # of Holes	<u>50</u>		
Depth	<u>33'</u>		
Hole Diameter	<u>4.0"</u>		
Burden	<u>8'</u>		
Spacing	<u>9'</u>		
Holes per Delay	<u>1</u>		
Pounds per Delay	<u>124.70 lbs</u>		
Pounds per Hole	<u>124.70 lbs</u>		
Total Est. Pounds	<u>6234.95 lbs</u>		
Powder Factor	<u>1.42 lbs/CY</u>		
Decks	<u>0</u>		
			Bottom Load: 3.0' SLURRAN 430 3"

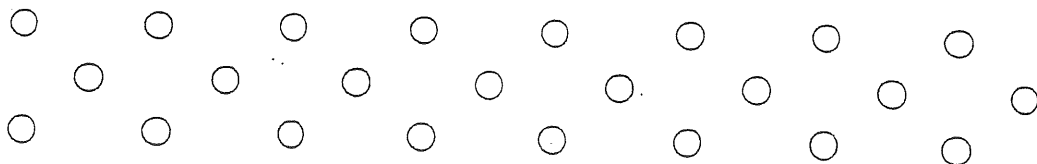
Blast Plan Notes  
 4 inch diameter hole

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>600</u>	Distance to Structure
lbs per Delay (w)	<u>124.70</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>53.73</u>	( sd = d / square root of w )
Esimated PPV	<u>0.27</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 600' from a structure utilizing 4.0" diameter at a 8' by 9' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



MAINE DRILLING AND BLASTING, INC.

Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 450 Feet

APENDIX A.

Blast Design Plan			
Est. # of Holes	<u>50</u>		
Depth	<u>33'</u>		Stemming: 5.0' Stemming Stone
Hole Diameter	<u>4.0"</u>		
Burden	<u>8'</u>		
Spacing	<u>9'</u>		
Holes per Delay	<u>1</u>		
Pounds per Delay	<u>124.70 lbs</u>		Dry Load: 16.3' PELLITE (ANFO)
Pounds per Hole	<u>124.70 lbs</u>		
Total Est. Pounds	<u>6234.95 lbs</u>		
Powder Factor	<u>1.42 lbs/CY</u>		
Decks	<u>0</u>		
		Wet Load: 8.8' EXTRA 1300 3"	
		Bottom Load: 3.0' SLURRAN 430 3"	

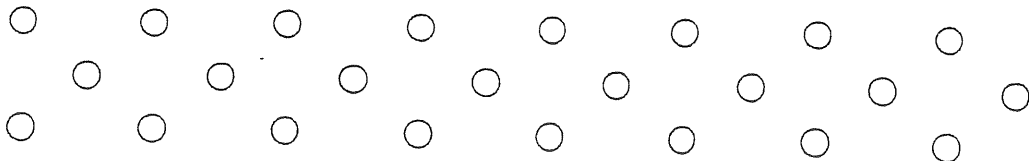
Blast Plan Notes  
 4 inch diameter hole

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>450</u>	Distance to Structure
lbs per Delay (w)	<u>124.70</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>40.30</u>	( $sd = d / \text{square root of } w$ )
Esimated PPV	<u>0.43</u>	( $ppv = k * sd^{-1.6}$ )

Typical for production work consistant holes 33' deep at 450' from a structure utilizing 4.0" diameter at a 8' by 9' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 400 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>8'</u>			
Spacing	<u>8'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>94.64 lbs</u>		Dry Load:	16.9' PELLITE (ANFO)
Pounds per Hole	<u>94.64 lbs</u>			
Total Est. Pounds	<u>4732.20 lbs</u>			
Powder Factor	<u>1.21 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	9.1' EMGEL250 -2.75	
		Bottom Load:	2.0' POWER PRIMER	

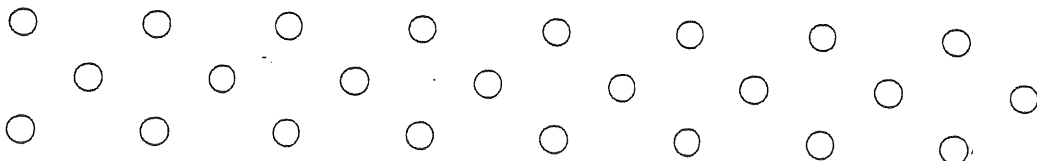
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>400</u>	Distance to Structure
lbs per Delay (w)	<u>94.64</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>41.12</u>	( $sd = d / \text{square root of } w$ )
Esimated PPV	<u>0.42</u>	( $ppv = k * sd^{-1.6}$ )

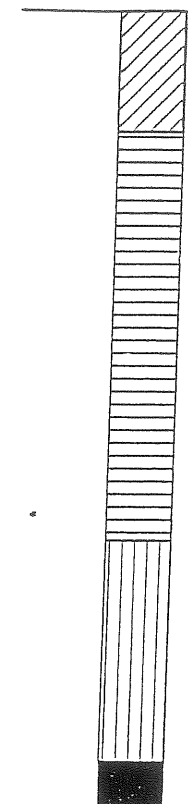
Typical for production work consistent holes 33' deep at 400' from a structure utilizing 3.5" diameter at a 8' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 350 feet

APENDIX A.

Blast Design Plan			
Est. # of Holes	<u>50</u>		Stemming: 5.0' Stemming Stone  Dry Load: 16.9' PELLITE (ANFO)  Wet Load: 9.1' EMGEL250 -2.75  Bottom Load: 2.0' POWER PRIMER
Depth	<u>33'</u>		
Hole Diameter	<u>3.5"</u>		
Burden	<u>8'</u>		
Spacing	<u>8'</u>		
Holes per Delay	<u>1</u>		
Pounds per Delay	<u>94.64 lbs</u>		
Pounds per Hole	<u>94.64 lbs</u>		
Total Est. Pounds	<u>4732.20 lbs</u>		
Powder Factor	<u>1.21 lbs/CY</u>		
Decks	<u>0</u>		

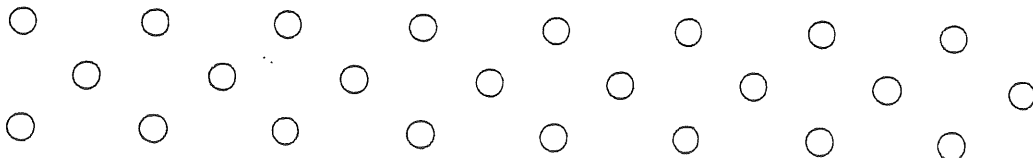
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>350</u>	Distance to Structure
lbs per Delay (w)	<u>94.64</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>35.98</u>	( $sd = d / \text{square root of } w$ )
Esimated PPV	<u>0.52</u>	( $ppv = k * sd^{-1.6}$ )

Typical for production work consistent holes 33' deep at 350' from a structure utilizing 3.5" diameter at a 8' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )





Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting w/deck at 300 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	6.0' Stemming Stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>7'</u>			
Spacing	<u>8'</u>		Dry Load:	7.5' PELLITE (ANFO)
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>42.28 lbs</u>		Wet Load:	4.0' EMGEL250 -2.75
Pounds per Hole	<u>84.57 lbs</u>		Bottom Load:	2.0' POWER PRIMER Stemming Stone
Total Est. Pounds	<u>4228.36 lbs</u>			
Powder Factor	<u>1.24 lbs/CY</u>		Dry Load:	7.5' PELLITE (ANFO)
Decks	<u>1</u>		Wet Load:	4.0' EMGEL250 -2.75
			Bottom Load:	1.0' POWER PRIMER

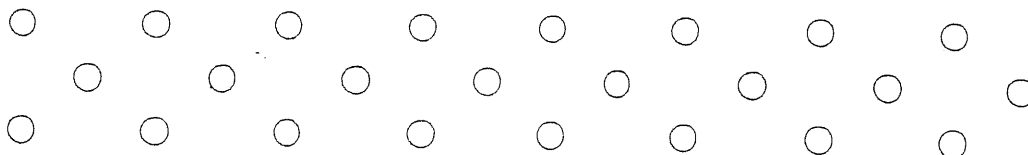
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>300</u>	Distance to Structure
lbs per Delay (w)	<u>42.28</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>46.14</u>	( sd = d / square root of w )
Esimated PPV	<u>0.35</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 300' from a structure utilizing 3.5" diameter at a 7' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )





**Jacques Whitford  
Company, Inc.**

75 Pearl Street, Suite 201, Portland, Maine, U.S.A. 04101  
Tel 207 761 7790 Fax 207 772 0385

Consulting Engineers  
Environmental Scientists  
Risk Consultants

**World Wide Web: [www.jacqueswhitford.com](http://www.jacqueswhitford.com)  
E-mail: [info@jacqueswhitford.com](mailto:info@jacqueswhitford.com)**

Maine • New Hampshire • Vermont • New York • Trinidad • Russia • Argentina  
Nova Scotia • New Brunswick • Prince Edward Island • Newfoundland & Labrador • Quebec • Ontario • Saskatchewan • Alberta • British Columbia • Northwest Territories

November 8, 2000

Mr. Dave Grinnell  
Dragon Products Company  
38 Preble Street  
P.O. Box 1521  
Portland, Maine 04104

Re: Report on Geologic Assessment of Proposed Quarry Expansion, Ocean Avenue Quarry,  
Portland, Maine

Dear Mr. Grinnell:

Jacques Whitford Company, Inc. (JWC) is pleased to provide this report on a geologic assessment of the proposed Dragon Products Company expansion of the Ocean Avenue Quarry in Portland, Maine. In accordance with our proposal dated July 25, 2000, JWC evaluated the proposed quarry expansion relative to the following concerns expressed by area citizens:

1. Blasting rock may result in the release and migration of groundwater contaminants from the closed Ocean Avenue Landfill to area properties.
2. Blasting rock may result in increased radon levels at area properties.
3. Blasting may damage natural gas pipelines or result in natural gas line explosions.
4. Repeated blasting may cause longer-term structural fatigue and damage to homes.

### **Project Location and Background**

The Dragon Products Company quarry is located west of Ocean Avenue, just north of Graves Hill in Portland, Maine. Site location plans are shown on Figures 1 and 2. The site is bounded to the north and south by undeveloped woods and residential property, to the east by Ocean Avenue, and to the west by the former City of Portland Ocean Avenue Landfill. Undeveloped woods and residential properties lie east of the quarry, across Ocean Avenue.



The rock quarry consists of about 20 acres, and has been in operation for over 70 years<sup>2</sup>. Construction of the existing garage and offices at the site were completed around 1939. Production of concrete at the site began in the 1940's.

Dragon Products Company is proposing improvements to the property, and limited expansion of the rock quarry. Improvements include relocation of the concrete production building and cement silo away from Ocean Avenue (towards the interior of the existing quarry), construction of a vegetated earthen berm along Ocean Avenue, construction of a new paved entrance north of the existing entrance, and addition of a climbing lane on Ocean Avenue. Removal of rock will be accomplished with a maximum of 20 rock blast events per year. Blasting will be conducted in accordance with a blast design plan that helps assure safe and efficient removal of the rock resource.

### Findings

The findings of our assessment are detailed below. Concerns raised by area citizens are discussed individually under the headings presented in the opening paragraph of this letter.

- 1. Blasting rock may result in the release and migration of groundwater contaminants from the closed Ocean Avenue Landfill to area properties.*

The City of Portland Ocean Avenue landfill reportedly operated for approximately 20 years until its closure in 1978.<sup>1</sup> In 1987, the City of Portland installed bedrock monitoring wells around the perimeter of the landfill. Sampling of groundwater from the bedrock wells between 1987 and 1994 indicated slightly elevated concentrations of hardness, specific conductance, calcium, iron, magnesium, manganese and potassium.<sup>2</sup> In a letter to the City of Portland dated June 11, 1996, Sebago Technics reported that the water quality data between 1987 and 1994 remained relatively constant, and created "no observable health risks." Properties in the area surrounding the former landfill are served by public water provided by the Portland Water District.

The City of Portland is presently completing closure of the landfill in accordance with criteria established by the Maine Department of Environmental Protection (MDEP). Installation of a landfill cover is substantially complete, and a fence has been erected to help prevent unauthorized access.

JWC reviewed the proposed Dragon Products Company blast design plan to evaluate whether blasting would result in the release and migration of groundwater contaminants at the landfill. The blast design plan, prepared by Maine Drilling & Blasting, Inc., specifies controlled blasting using timed delays and requirements for blast hole diameter, depth, spacing, and charge weight,

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<sup>1</sup> Haley & Aldrich, Inc., "Report on Oil and Hazardous Material Site Evaluation, Cook Concrete Property, Portland, Maine." February, 1991.

<sup>2</sup> Sebago Technics, "City of Portland - Ocean Avenue Landfill," June 11, 1996.



among others (refer to Appendix A). Given the parameters proposed in the blast design plan, a peak particle velocity (a measure of seismic vibration) of about 4.8 inches per second (ips) is estimated for the portion of the landfill closest to the proposed quarry expansion area. Dragon Products Company provides a buffer of at least 100 feet between the proposed quarry expansion area and the landfill.

The estimated particle velocity at the landfill is well below that which would result in fracturing of bedrock. Therefore, the risk of release and migration of contaminants through air, soils or water, as a result of blast-induced fractures at the landfill, is low. For example, researchers have identified a conservative lower limit for cracking of granite at a seismic velocity of 28 ips.<sup>3</sup> Other sources report that the radius of rock fracturing around a blast hole is limited to a radius of 20 to 40 blast-hole diameters.<sup>4</sup> Based on this guidance, the zone of rock fracturing beyond the quarry expansion area would be limited to about 13 feet. The relatively low particle velocities estimated for the landfill site are also unlikely to cause damage (such as opening of fissures) to the landfill cover.

In summary, previous reports indicate that the former City of Portland Ocean Avenue Landfill has had some impact on groundwater quality, but not at concentrations that pose a significant threat to human health or the environment at area properties. Due to the relatively low seismic velocities estimated by Maine Drilling & Blasting, Inc., the risk that blasting at the proposed quarry expansion will significantly impact water quality at the former landfill, or at properties in the former landfill vicinity, is low. Maine Drilling & Blasting has prepared a blast design plan to minimize the effects of blasting at the site and in the site vicinity.

*2. Blasting rock may result in increased radon levels at area properties.*

Discussions with Robert Stillwell of the Maine Radiation Control Program indicate numerous incidences of high radon levels at homes in the vicinity of the proposed Dragon Products Company quarry expansion.<sup>5</sup> Radon is a naturally-occurring radioactive gas that originates in rock and sediment. Radon can be present in homes as a result of migration from bedrock fractures and pore space in sediments. At certain concentrations, radon poses a health risk.

JWC reviewed the Maine Drilling & Blasting, Inc., blast plan for the proposed quarry expansion to evaluate the potential for the release of radon to area properties as a result of rock blasting. The blast plan provides estimated peak particle velocities at distances ranging from 300 to 600 feet from the quarry expansion boundary. The closest residence is about 300 feet from the quarry expansion boundary. The estimated peak particle velocities reported by Maine Drilling & Blasting, Inc., range from 0.27 to 0.52 ips.

<sup>3</sup> Charles H. Dowding, "Blast Vibration Monitoring and Control," Northwestern University, 1985.

<sup>4</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.

<sup>5</sup> Robert Stillwell, Letter to Ann Elderkin, P.A., City of Portland, regarding radon levels in the Portland area, dated April 15, 1999.



The predicted range of seismic velocities at area residences is at least 50 times lower than that required to fracture crystalline bedrock.<sup>3</sup> As a result, the closest residence, located about 300 feet from the quarry expansion boundary, is well beyond the predicted zone of bedrock fracturing. As reported earlier in this report, the zone of rock fracturing is limited to a radius of about 13 feet from each blast hole. Based on this data, the risk that blasting at the proposed quarry expansion area will result in the release of radon to homes or other structures as a result of rock fracturing, is negligible. Blast-induced vibration of rock and sediment alone would not result in a significant release of radon given the relatively low particle velocities predicted, and the short duration of blast events.

In summary, while high radon levels have been reported in the vicinity of the proposed quarry expansion area, the risk that blasting of bedrock and associated vibrations will result in a significant release of radon, is negligible. This finding is based on the low vibration levels predicted for the surrounding areas as detailed in the blast design plan by Maine Drilling & Blasting, Inc. (Appendix A).

*3. Blasting may damage natural gas pipelines or result in natural gas line explosions.*

JWC contacted Northern Utilities, Inc., to identify natural gas pipelines in the vicinity of the proposed quarry expansion area. Pipeline maps provided by Northern Utilities indicate the closest gas lines to the quarry are located at the Wellstone Condominium complex, about 1,800 feet south of the southernmost quarry expansion boundary. Based on this distance and the blast plan data provided by Maine Drilling & Blasting, Inc., JWC calculated a peak particle velocity of 0.05 ips. This low particle velocity is substantially below the United States Bureau of Mines "safe" particle velocity of 2.0 ips.<sup>6</sup> The threshold for damage, defined as the development of cracks in plaster, is generally considered to occur at a velocity of 2.0 ips.

Given the considerable distance from the proposed quarry expansion area to the nearest natural gas pipeline, JWC finds that the risk of damage to this pipeline, as a result of blasting at the quarry, is negligible. The predicted vibration levels at the pipeline are about 40 times less than the damage threshold for structures of 2.0 ips.

*4. Repeated blasting may cause longer-term structural fatigue and damage to homes.*

JWC evaluated the potential for repeated blasting events to result in damage to off-site structures due to structural fatigue. A number of studies have been undertaken by the United States Bureau of Mines and others to assess the effects of repeated blasting on structures.<sup>6</sup> For example, the Bureau of Mines subjected a wood frame house, located an estimated 100 to 200 feet from a mine, to 587 production blasts, after which it was mechanically shaken to determine the threshold for fatigue cracking. The first crack appeared after the equivalent of 28 years of

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<sup>6</sup> Calvin J. Konya and Edward J. Walter, "Subsurface Blast Design," Prentice Hall, Englewood Cliffs, New Jersey, 1990.



blasting, twice a day, at a vibration level of 0.5 ips. The reported damage consisted of a cracked wall board tape joint.<sup>6</sup>

Studies of the effects of repeated low-level vibrations from blasting indicate little potential for damage to structures. Reports indicate that particle velocities approaching 2.0 ips are required to create damage under repeated blasting scenarios; the predicted range of particle velocities for properties in the vicinity of the quarry expansion is 0.27 to 0.52 ips. As stated earlier in this report, 2.0 ips is commonly cited as the threshold for damage during a single blast event.

### Conclusions

The Dragon Products Company quarry on Ocean Avenue has been in operation for over 70 years. Dragon is proposing improvements to the property and limited expansion of rock quarry operations that will involve a maximum of 20 blast events per year. Area residents have expressed concerns over the impacts of rock blasting, including the potential for the release of contaminants from the closed City of Portland Ocean Avenue Landfill, release of radon at area residences, damage to natural gas pipelines, and structural damage to buildings due to repeated blasting events.

Maine Drilling & Blasting, Inc., has prepared a site-specific blast design plan that specifies controlled blasting using timed delays and requirements for blast hole diameter, depth, spacing, and charge weight, among others. JWC has reviewed this plan relative to each of the concerns expressed by the area citizens. JWC concludes that the risk of impacts to the neighborhood for each area of concern is low. This finding is based on the substantial distance of off-site buildings and natural gas pipelines from the quarry, the relatively low predicted blast-induced vibrations beyond the quarry expansion area, and scientific data on the impacts of blasting gathered by researchers, including the United States Bureau of Mines.

### Closure

JWC's findings are based solely on the scope of work conducted and sources of information referenced in this report. Any additional information that becomes available concerning this site should be provided to us so that our conclusions may be reviewed and modified, if necessary. Our work has been undertaken in accordance with generally accepted consulting engineering practices. No other warranty, expressed or implied, is made.



Mr. Dave Grinnell  
November 8, 2000  
Page 6

Please feel free to contact us should you have any questions regarding this report.

Sincerely,  
Jacques Whitford Company, Inc.



D. Todd Coffin, C.G.  
Senior Environmental Geologist

Figure 1 Dragon Products Quarry, Portland, ME  
Figure 2 Site Plan  
Appendix A Blast Design Plan

MEP00123\rept1



**APPENDIX A**  
**BLAST DESIGN PLAN**





Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 600 Feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming Stone
Hole Diameter	<u>4.0"</u>			
Burden	<u>8'</u>			
Spacing	<u>9'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>124.70 lbs</u>		Dry Load:	16.3' PELLITE (ANFO)
Pounds per Hole	<u>124.70 lbs</u>			
Total Est. Pounds	<u>6234.95 lbs</u>			
Powder Factor	<u>1.42 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	8.8' EXTRA 1300 3"	
		Bottom Load:	3.0' SLURRAN 430 3"	

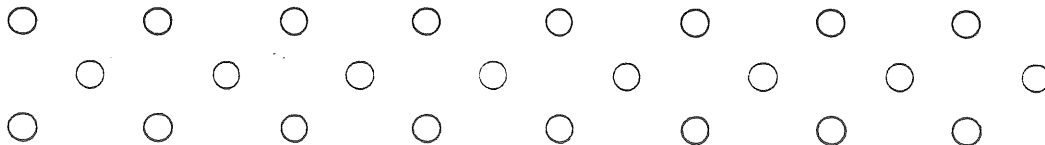
Blast Plan Notes  
 4 inch diameter hole

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>600</u>	Distance to Structure
lbs per Delay (w)	<u>124.70</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>53.73</u>	( sd = d / square root of w )
Esimated PPV	<u>0.27</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 600' from a structure utilizing 4.0" diameter at a 8' by 9' pattern.

Plan View/Timing Design ( please see attached timing diagrams )

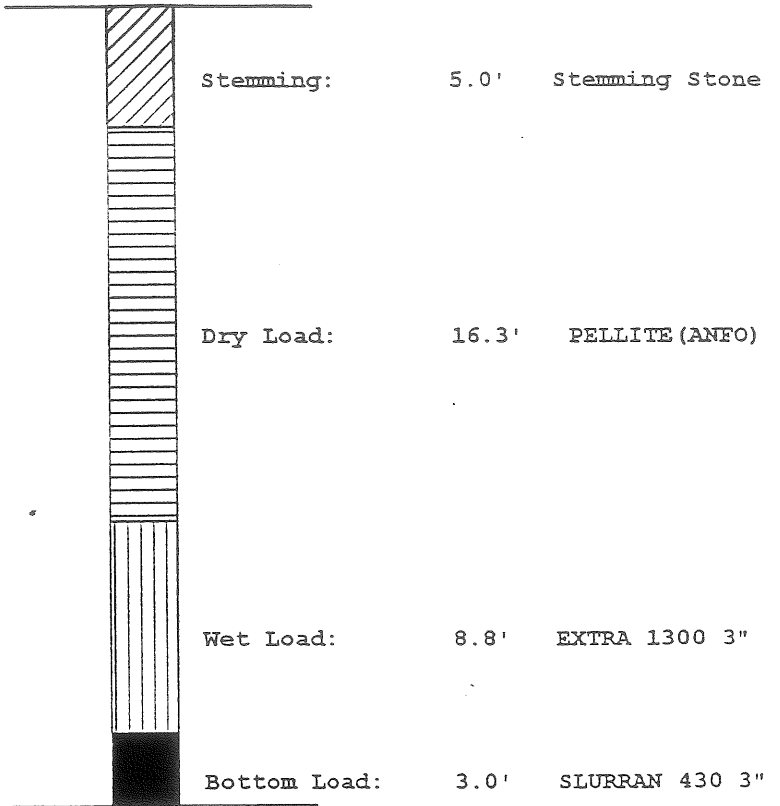


Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 450 Feet

APENDIX A.

Blast Design Plan

Est. # of Holes	50
Depth	33'
Hole Diameter	4.0"
Burden	8'
Spacing	9'
Holes per Delay	1
Pounds per Delay	124.70 lbs
Pounds per Hole	124.70 lbs
Total Est. Pounds	6234.95 lbs
Powder Factor	1.42 lbs/CY
Decks	0



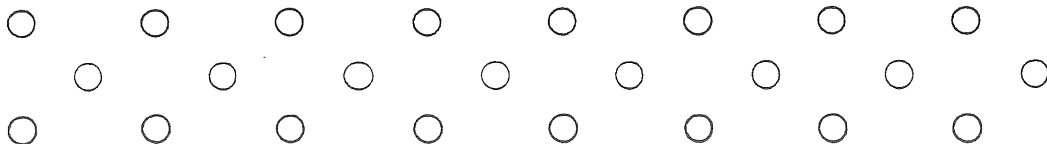
Blast Plan Notes  
 4 inch diameter hole

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	160	Ground Constant based on Site/Rock Conditions
Distance ft (d)	450	Distance to Structure
lbs per Delay (w)	124.70	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	40.30	( sd = d / square root of w )
Esimated PPV	0.43	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 450' from a structure utilizing 4.0" diameter at a 8' by 9' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 400 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	5.0' Stemming Stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>8'</u>			
Spacing	<u>8'</u>			
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>94.64 lbs</u>		Dry Load:	16.9' PELLITE (ANFO)
Pounds per Hole	<u>94.64 lbs</u>			
Total Est. Pounds	<u>4732.20 lbs</u>			
Powder Factor	<u>1:21 lbs/CY</u>			
Decks	<u>0</u>			
		Wet Load:	9.1' EMGEL250 -2.75	
		Bottom Load:	2.0' POWER PRIMER	

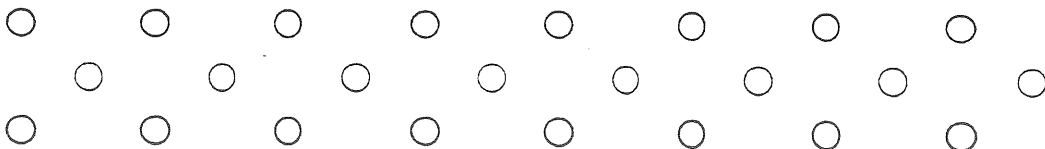
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>400</u>	Distance to Structure
lbs per Delay (w)	<u>94.64</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>41.12</u>	( sd = d / square root of w )
Esimated PPV	<u>0.42</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 400' from a structure utilizing 3.5" diameter at a 8' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting at 350 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	50			
Depth	33'		Stemming:	5.0' Stemming Stone
Hole Diameter	3.5"			
Burden	8'			
Spacing	8'			
Holes per Delay	1			
Pounds per Delay	94.64 lbs		Dry Load:	16.9' PELLITE (ANFO)
Pounds per Hole	94.64 lbs			
Total Est. Pounds	4732.20 lbs			
Powder Factor	1.21 lbs/CY			
Decks	0			
			Wet Load:	9.1' EMGEL250 -2.75
			Bottom Load:	2.0' POWER PRIMER

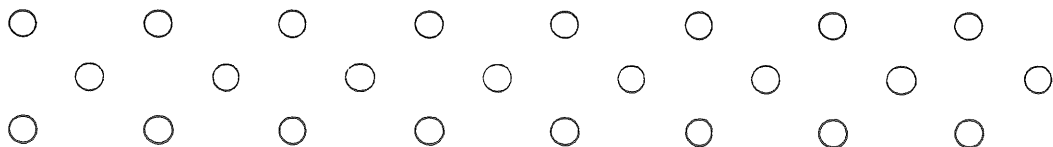
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	160	Ground Constant based on Site/Rock Conditions
Distance ft (d)	350	Distance to Structure
lbs per Delay (w)	94.64	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	35.98	( $sd = d / \text{square root of } w$ )
Esimated PPV	0.52	( $ppv = k * sd^{-1.6}$ )

Typical for production work consistent holes 33' deep at 350' from a structure utilizing 3.5" diameter at a 8' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )



Blast Design Plan  
 DRAGON PRODUCTS QUARRY  
 Description: OPEN ROCK  
 Production Blasting w/deck at 300 feet

APENDIX A.

Blast Design Plan				
Est. # of Holes	<u>50</u>			
Depth	<u>33'</u>		Stemming:	6.0' Stemming Stone
Hole Diameter	<u>3.5"</u>			
Burden	<u>7'</u>			
Spacing	<u>8'</u>		Dry Load:	7.5' PELLITE (ANFO)
Holes per Delay	<u>1</u>			
Pounds per Delay	<u>42.28 lbs</u>		Wet Load:	4.0' EMGEL250 -2.75
Pounds per Hole	<u>84.57 lbs</u>		Bottom Load:	2.0' POWER PRIMER Stemming Stone
Total Est. Pounds	<u>4228.36 lbs</u>			
Powder Factor	<u>1.24 lbs/CY</u>			
Decks	<u>1</u>	Dry Load:	7.5' PELLITE (ANFO)	
		Wet Load:	4.0' EMGEL250 -2.75	
		Bottom Load:	1.0' POWER PRIMER	

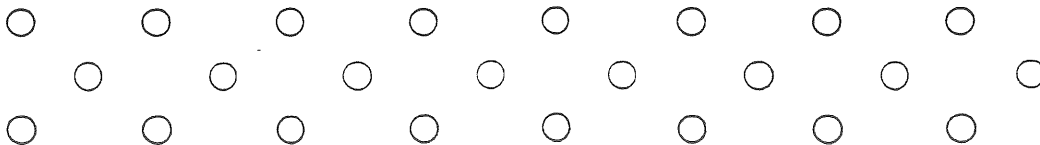
Blast Plan Notes  
 3.5 inch diameter holes

Vibration Predication ( formula based on Dupont Handbook )

Site Factor (k)	<u>160</u>	Ground Constant based on Site/Rock Conditions
Distance ft (d)	<u>300</u>	Distance to Structure
lbs per Delay (w)	<u>42.28</u>	lbs explosives per 8 milisecond Delay
Scaled Distance (sd)	<u>46.14</u>	( sd = d / square root of w )
Esimated PPV	<u>0.35</u>	( ppv = k * sd ^ - 1.6 )

Typical for production work consistent holes 33' deep at 300' from a structure utilizing 3.5" diameter at a 7' by 8' pattern.

Plan View/Timing Design ( please see attached timing diagrams )





# City of Portland Site Plan Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

Address of Proposed Development: 960 Ocean Avenue		Zone: ROS
Total Square Footage of Proposed Structure: Not Applicable	Square Footage of Lot: Approx. 15 acres	
Tax Assessor's Chart, Block & Lot:  Chart#            Block#            Lot# 414                A002                001	Property owner's mailing address: City of Portland 389 Congress Street Portland, Maine 04101	Telephone #: 874-8793
Consultant/Agent, mailing address, phone # & contact person:  Sebago Technics, Inc. 1 Chabot Street Westbrook, Maine 04098 856-0277    Christopher Di Matteo	Applicant's name, mailing address, telephone #/Fax#/Pager#:  Portland Parks and Rec. Dept 17 Arbor Street Portland, Maine 04103 874-8793	Project name:  Ocean Ave. Dog Park
<b>Proposed Development (check all that apply)</b> <input type="checkbox"/> New Building <input type="checkbox"/> Building Addition <input type="checkbox"/> Change of Use <input type="checkbox"/> Residential <input type="checkbox"/> Office <input type="checkbox"/> Retail <input type="checkbox"/> Manufacturing <input type="checkbox"/> Warehouse/Distribution <input checked="" type="checkbox"/> Parking lot <input type="checkbox"/> Subdivision (\$500.00) + amount of lots _____ (\$25.00 per lot) \$ _____ <input type="checkbox"/> Site Location of Development (\$3,000.00) (except for residential projects which shall be \$200.00 per lot _____ ) <input type="checkbox"/> Traffic Movement (\$1,000.00) <input type="checkbox"/> Stormwater Quality (\$250.00) <input type="checkbox"/> Section 14-403 Review (\$400.00 + \$25.00 per lot) <input checked="" type="checkbox"/> Other_DOG PARK _____		
<b>Major Development (more than 10,000 sq. ft.)</b> <input type="checkbox"/> Under 50,000 sq. ft. (\$500.00) <input type="checkbox"/> 50,000 - 100,000 sq. ft. (\$1,000.00) <input type="checkbox"/> Parking Lots over 100 spaces (\$1,000.00) <input type="checkbox"/> 100,000 - 200,000 sq. ft. (\$2,000.00) <input type="checkbox"/> 200,000 - 300,000 sq. ft. (\$3,000.00) <input type="checkbox"/> Over 300,000 sq. ft. (\$5,000.00) <input type="checkbox"/> After-the-fact Review (\$1,000.00 + applicable application fee)		
<b>Minor Site Plan Review</b> <input checked="" type="checkbox"/> Less than 10,000 sq. ft. (\$400.00) <input type="checkbox"/> After-the-fact Review (\$1,000.00 + applicable application fee)		
<b>Plan Amendments</b> <input type="checkbox"/> Planning Staff Review (\$250.00) <input type="checkbox"/> Planning Board Review (\$500.00)		
- Please see next page -		

Who billing will be sent to: (Company, Contact Person, Address, Phone #)

DENISE ALBERT, DIRECTOR (FEE WAIVED)  
PARKS & RECREATION X 8793

Submittals shall include (9) separate folded packets of the following:

- a. copy of application
- b. cover letter stating the nature of the project
- c. site plan containing the information found in the attached sample plans check list

**Amendment to Plans:** Amendment applications should include 6 separate packets of the above (a, b, & c)  
**ALL PLANS MUST BE FOLDED NEATLY AND IN PACKET FORM**

Section 14-522 of the Zoning Ordinance outlines the process; copies are available at the counter at .50 per page (8.5 x11) you may also visit the web site: [ci.portland.me.us](http://ci.portland.me.us) chapter 14

*I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.*

Signature of applicant:

*Ann D'Alfonso, ST1*

Date:

2.27.04

This application is for site review ONLY, a building Permit application and associated fees will be required prior to construction.

## Development in Portland

The City of Portland has instituted the following fees to recover the costs of reviewing development proposals under the Site Plan and Subdivision ordinances: application fee; engineering fee; and inspection fee. Performance and defect guarantees are also required by ordinance to cover all site work proposed.

The **Application Fee** covers general planning and administrative processing costs, and is paid at the time of application.

The Planning Division is required to send notices to neighbors upon receipt of an application and prior to public meetings. The applicant will be billed for mailing and advertisement costs. Applicants for development will be charged an **Engineering Review Fee**. This fee is charged by the Planning Division for review of on-site improvements of a civil engineering nature, such as storm water management as well as the engineering analysis of related improvements within the public right-of-way, such as public streets and utility connections, as assessed by the Department of Public Works. The Engineering Review fee must be paid before a building permit can be issued. Monthly invoices are sent out by the Planning Division on a monthly basis to cover engineering costs.

A **Performance Guarantee** will be required following approval of development plans. This guarantee covers all required improvements within the public right-of-way, plus certain site improvements such as landscaping, paving, and drainage improvements. The Planning Division will provide a cost estimate form for figuring the amount of the performance guarantee, as well as sample form letters to be filled out by a financial institution.

An **Inspection Fee** must also be submitted to cover inspections to ensure that sites are developed in accordance with the approved plan. The inspection fee is 2.0% of the performance guarantee amount, or as assessed by the planning or public works engineer. The minimum inspection fee is \$300 for development, unless no site improvements are proposed. Public Works inspects work within the City right-of-way and Planning inspects work within the site including pipe-laying and connections. (The contractor must work with inspectors to coordinate timely inspections, and should provide adequate notice before inspections, especially in the case of final inspection.)

Upon completion of a development project, the performance guarantee is released, and a **Defect Guarantee** in the amount of 10% of the performance guarantee must be provided. The Defect Guarantee will be released after a year.

Other reimbursements to the City include actual or apportioned costs for advertising and mailed notices. All fees shall be paid prior to the issuance of any building permit.

For more information on the fees or review process, please call the Planning Division at 874-8719 or 874-8721.



# City Of Portland Site Plan Checklist

OCEAN AVE DOG PARK

Project Name, Address of Project

Application Number

Submitted ( ) & Date	Item	Required Information	Section 14-525 (b,c)
✓	(1)	Standard boundary survey (stamped by a registered surveyor, at a scale of not less than 1 inch to 100 feet and including:	1
✓	(2)	Name and address of applicant and name of proposed development	a
✓	(3)	Scale and north points	b
* ✓	(4)	Boundaries of the site	c
✓	(5)	Total land area of site	d
* ✓	(6)	Topography - existing and proposed (2 feet intervals or less)	e
✓	(7)	Plans based on the boundary survey including:	2
N.A.	(8)	Existing soil conditions	a
✓	(9)	Location of water courses, marshes, rock outcroppings and wooded areas	b
N.A.	(10)	Location, ground floor area and grade elevations of building and other structures existing and proposed, elevation drawings of exterior facades, and materials to be used	c
✓	(11)	Approx location of buildings or other structures on parcels abutting the site	d
N.A.	(12)	Location of on-site waste receptacles	e
✓	(13)	Public utilities	e
✓	(14)	Water and sewer mains	e
✓	(15)	Culverts, drains, existing and proposed, showing size and directions of flows	e
✓	(16)	Location and dimensions, and ownership of easements, public or private rights-of-way, both existing and proposed	f
✓	(17)	Location and dimensions of on-site pedestrian and vehicular access ways	
✓	(18)	Parking areas	g
N.A.	(19)	Loading facilities	g
✓	(20)	Design of ingress and egress of vehicles to and from the site onto public streets	g
N.A.	(21)	Curb and sidewalks	g
* ✓	(22)	Landscape plan showing:	h
✓	(23)	Location of existing proposed vegetation	h
✓	(24)	Type of vegetation	h
✓	(25)	Quantity of plantings	h
✓	(26)	Size of proposed landscaping	h
✓	(27)	Existing areas to be preserved	h
✓	(28)	Preservation measures to be employed	h
✓	(29)	Details of planting and preservation specifications	h
✓	(30)	Location and dimensions of all fencing and screening	i
✓	(31)	Location and intensity of outdoor lighting system	j
N.A.	(32)	Location of fire hydrants, existing and proposed	k
✓	(33)	Written statement	c
✓	(34)	Description of proposed uses to be located on site	1
✓	(35)	Quantity and type of residential, if any	1
✓	(36)	Total land area of the site	b2
N.A.	(37)	Total floor area and ground coverage of each proposed building and structure	b2
✓	(38)	General summery of existing and proposed easements or other burdens	c3
✓	(39)	Method of handling solid waste disposal	4
N.A.	(40)	Applicant's evaluation of availability of off-site public facilities, including sewer, water and streets	5
✓	(41)	Description of any problems of drainage or topography, or a representation that there are none	6
N.A.	(42)	An estimate of the time period required for completion of the development	

\* See comments



✓		(43) A list of all state and federal regulatory approvals to which the development may be subject to	8
✓		(44) The status of any pending applications	8
✓		(45) Anticipated timeframe for obtaining such permits	h8
		(46) <u>A letter of non jurisdiction ?</u>	h8
N.A.		(47) Evidence of financial and technical capability to undertake and complete the development including a letter from a responsible financial institution stating that it has reviewed the planned development and would seriously consider financing it when approved.	

Note: Depending on the size and scope of the proposed development, the Planning Board or Planning Authority may request additional information, including (but not limited to):

- drainage patterns and facilities;
- an environmental impact study;
- erosion and sedimentation controls to be used during construction;
- a sun shadow study;
- a parking and/or traffic study;
- a study of particulates and any other noxious emissions;
- and
- a noise study;
- a wind impact analysis.

Other comments:

(1) Site Plan is based on a combination of land survey & aerial photography. ~~The land survey~~ STI has completed a land topographic survey of the eastern half of the site July 2003. The aerial photography <sup>provided by</sup> has the copy of future use is the basis of the planning ~~in~~ <sup>with</sup>

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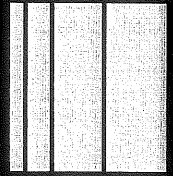
✓	(43)	A list of all state and federal regulatory approvals to which the development may be subject to	8
✓	(44)	The status of any pending applications	8
✓	(45)	Anticipated timeframe for obtaining such permits	h8
—	(46)	A letter of non jurisdiction	h8
N.A.	(47)	Evidence of financial and technical capability to undertake and complete the development including a letter from a responsible financial institution stating that it has reviewed the planned development and would seriously consider financing it when approved.	

Note: Depending on the size and scope of the proposed development, the Planning Board or Planning Authority may request additional information, including (but not limited to):

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>- drainage patterns and facilities;</li> <li>- erosion and sedimentation controls to be used during construction;</li> <li>- a parking and/or traffic study;</li> <li>and</li> <li>- a noise study;</li> </ul> | <ul style="list-style-type: none"> <li>- an environmental impact study;</li> <li>- a sun shadow study;</li> <li>- a study of particulates and any other noxious emissions;</li> <li>- a wind impact analysis.</li> </ul> |
|---|--|

Other comments:

- SITE PLAN IS BASED ON A COMBINATION OF LAND SURVEY & AERIAL SURVEY. STI HAS COMPLETED A TOPO. SURVEY OF THE EASTERN 1/2 OF THE SITE IN 2003. THE AERIAL INFO WAS PROVIDED BY THE ENGINEERING DIV of PUBLIC WORKS.
- BOUNDARY INFO IS FROM THE 1984 PLAN PREPARED BY OWEN HASKEL.
- PLANTING CONSIST ONLY OF TURF FOR EROSION CONTROL OF DISTURBED AREAS.



February 27, 2004  
94393

Ms. Sarah Hopkins  
Planning Division  
City of Portland  
389 Congress Street  
Portland, ME 04101

## Minor Site Plan Review, Ocean Avenue Dog Park, Portland

Dear Sarah:

We are submitting this Minor Site Plan application on behalf of the City of Portland-Parks and Recreation Department. The subject property is located at 960 Ocean Avenue in the City of Portland and shown as Lot A-2-001 on Tax Map 414. Attached is copy of a *Plan of Land* prepared by Owen Haskell, Inc. in January 1984 that, to our knowledge, shows the most recent boundary survey.

### Background

The City has been working with the Off Leash Area Committee (OLA) to identify and locate fenced-in off leash areas since March of 2001 prior to the closing of Western Cemetery to dogs in June of the same year. Progress was made in 2002 with the identification of a potential *Dog Park* site on the City-owned former landfill area along Ocean Avenue. Parks and Recreation's Design and Construction staff prepared a conceptual site plan that was presented to the City Council in June 2002 subsequent to a positive Public Informational Meeting held with the neighbors in the area. In Spring of 2003, after continued meetings between the OLA Committee, City Councilors Geraghty and Leeman, and Parks and Recreation staff, Sebago Technics was retained to design the new facility.

In August, 2003, a site evaluation was prepared by Sebago Technics to determine the probable extent and type of material that may have been buried and disposed of in the proposed dog park area. Observations suggested that the proposed site was not suitable and the area closer to Ocean Avenue was more appropriate since testing here indicates inert materials are part of the fill. The report, which uses the original concept prepared by Parks and Recreation, is attached for your review.

### The Proposal

The proposed development is a 9-acre Dog Park, with associated walking trails and fenced-in off-leash area. Gravel footpaths and a gravel driveway and parking area also part of the site's proposed development. The total area of this property is  $15 \pm$  acres and is adjacent to the former Ocean Avenue Landfill, approximately  $43 \pm$  acres to the west. The proposed development, however, is located along Ocean Avenue within an area of pre-existing inert fill, and is not located within the closed landfill area that dominates the rear of the parcel. In addition, the actual area that is being actively developed is only  $4 \pm$  acres

The proposed development consists primarily of establishing a fenced-in area for dogs to run off-leash. The use necessitates a safe pedestrian route to access and travel within the new facility, formalized parking and safe vehicular entry/egress to the new facility, and minor grading and drainage to facilitate conveyance of new and existing stormwater flows.

### Fenced Off-Leash Area

As shown on the Site Plan, the fenced area consists of two types of perimeter fence: black vinyl chain-link (5' high), and galvanized wire mesh (4' high). The former is located primarily along Ocean Avenue, the parking lot, and both entrances. The galvanized wire mesh is an agricultural grade fixed-knot fence that is more suitable for those areas that the slope of the terrain can be an issue and/or may receive less impact. An 8' wide gravel walk is proposed as a circuit negotiating the eastern (closest to Ocean Avenue) half of the facility. The terrain in this area is characterized as a 20' high plateau that consists primarily of inert fill. The proposed walk is located at the base of the plateau, except to the south where the walk negotiates the steep side slope via a series of proposed steps. These steps are planned to be constructed with recycled granite curb from the City's stockpile. The walk accesses the proposed parking area to the north (located along the active gravel entrance drive) and a proposed maintenance/pedestrian entrance along an existing gravel drive located to the south (drive closed to vehicular use). The pedestrian entrances are planned to have double gates to allow for a foyer-type pen that will facilitate keeping un-leashed dogs in the facility. A circular area along the walk, located near Ocean Avenue, is proposed as an area for seating and access to public water.

The remaining fenced-in area to the west of the plateau is planned to have a 4' wide trail for less formal access by visitors and their dogs. The trail, however, is expected to be improved overtime and will not receive any special surfacing as part of this project's construction.

### Parking and Entrance Drive Area

The existing gravel entrance drive is only 12' wide and its approach from Ocean Avenue has an excessive slope of 12%. The new gravel drive, with associated parking for 14 vehicles and associated entrance, will be constructed on the northeast corner of the site, utilizing the existing gravel access alignment. It is designed with a 24' width and an 18" depth of aggregate. Bituminous paved apron is proposed where the drive meets Ocean Avenue which will minimize amount of gravel migrating into the right-of-way. The existing chain-link fence and gate will be relocated to just past the proposed parking with the addition of a pedestrian entrance.

Grading and Drainage

A Tier I Permit for wetland impact was submitted to Maine DEP in mid-January of this year and we expect a decision by the end of this month. The parking area and trailheads will alter wetlands in the northerly side of the property. Proposed grading of the existing ponded wetland area and a partial filling of associated wetlands are proposed in the northern section of the property's entrance. The rest of the wetlands will be altered as a result of construction of the trailheads extending from the gravel parking area in a southwesterly direction. Drainage culverts are proposed in this portion of the fill area to allow for drainage between existing wetland locations. Mostly fill will be necessary to maintain a regular slope along the new walk, especially in the area of the new granite steps.

Site Lighting

Lighting will be provided on site via a CMP lease. As part of the lease, CMP will install the poles and fixtures as per the City's request. The Site Plan shows one new light and pole at the proposed parking area which will be connected to the existing CMP pole on Ocean Avenue just north of the entrance. Depending on the existing street light coverage, a fixture and perhaps another pole may be necessary in this area to adequately light the entrance.

Solid Waste Disposal

The solid waste disposal will be provided by the Department of Parks and Recreation. Plastic *doggie-doo* bags will be provided along with trash receptacles. Trash receptacles will be emptied as part of the Department's regular park solid waste removal process.

As per our phone conversation, the following items requested in Sec. 14-525 (c) *Written Statements* that are not addressed in this project narrative have been addressed on the attached *Site Plan Checklist* as being not applicable or qualified with additional information.

Also attached is the Tier 1 application that we have submitted on behalf of the City, a copy of the 1984 boundary survey prepared by Owen Haskell, Inc., and a portion of the Site Investigation Report prepared by Sebago Technics. Please contact me with any questions or to set up a time to meet and discuss the project and application.

Sincerely,

SEBAGO TECHNICS, INC.

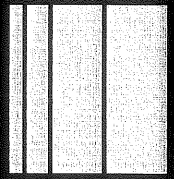


Christopher A. DiMatteo, RLA  
Project Manager

CAD:cad/jc

Enc.

cc: Denise Albert, Director, Parks and Recreation Dept.



January 19, 2004  
94393

Ms. Linda Kokemuller  
Department of Environmental Protection  
312 Canco Road  
Portland, ME 04103

## **Tier 1 Wetland Alteration Application, Ocean Avenue Dog Park, Portland**

Dear Linda:

We are submitting this Tier 1 wetland alteration application on behalf of the City of Portland-Parks and Recreation Department. The subject property is located on Ocean Avenue in the City of Portland and shown as Lots 2, 3, 6, 10, 11 and 12 on Tax Map 415. The proposed development is a 9-acre Dog Park, with associated walking trails and fenced in off-leash area. Gravel footpaths and a gravel driveway and parking area are also part of the site's proposed development. The total area of this property is  $\pm 43$  acres, and is the location of the former Ocean Avenue Landfill. The proposed development, however, is located along Ocean Avenue within an area of pre-existing inert fill, and is not located within the closed landfill area that dominates the rear of the parcel.

The wetlands on the subject property are classified as forested wetlands and there are no wetlands of special significance. These wetlands are composed of *Acer rubrum* (Red Maple), *Sphagnum palustre* (Sphagnum Moss), *Alnus incana* (Speckled Alder), and *Typha latifolia* (Broad-leaved Cattail). The existing wetlands are temporarily saturated during spring conditions, with a ponded area extending along the gravel drive at the northeastern portion of the site. The wetlands were delineated in the fall of 2003.

A proposed gravel drive with associated parking for 14 vehicles and associated trailheads will be constructed on the northeast corner of the site utilizing the existing gravel access road. This parking area and trailheads will alter wetlands in the northerly side of the property. Proposed grading of the existing ponded wetland area, as well as a partial filling of associated wetlands are proposed in the northern section of the property's entrance. The rest of the wetlands will be altered as a result of construction of the trailheads extending from the gravel parking area in a southwesterly direction. Drainage culverts are proposed in this portion of the fill area to allow for drainage between existing wetland locations.

The subject site's existing topography restricts proposed development in areas other than what has been proposed. Significant elevation changes associated with the inert fill, coupled with the proposed utilization of the current gravel entrance make the proposed parking area the most feasible area for the development of the dog park.

Enclosed are photos of the project area, a Tier 1 application form and appropriate fee, a USGS topographic map, a site plan of the proposed project, and a cross-section of the proposed wetland fill. Please contact me with any questions regarding this matter.

Sincerely,

SEBAGO TECHNICS, INC.

Grant E. Austin  
Environmental Scientist

GEA:gea/jc  
Enc.

cc: City of Portland-Parks and Recreation Dept.  
Earle G. Shettleworth, Jr., MHPC

**STATEMENT OF AVOIDANCE & MINIMIZATION****Fenced Dog Park  
Ocean Avenue  
Portland, Maine**

This Statement of Avoidance & Minimization has been prepared by Sebago Technics, Inc. on behalf of the Parks and Recreation Department, City of Portland as part of the Tier 1 Wetland Alteration Application for the proposed development located along Ocean Avenue (at the intersection of Presumpscot Street) in Portland. The proposed development is a 9-acre Dog Park, with associated walking trails and fenced in off-leash area. Gravel footpaths, driveway, and parking area are also part of the site's proposed development. The total area of this property is  $\pm 43$  acres and is the location of the former Ocean Avenue Landfill. The proposed development, however, is located along Ocean Avenue within an area of pre-existing inert fill, and is not located within the closed landfill area that dominates the rear of the parcel.

The wetlands on the subject property are classified as forested wetlands and there are no wetlands of special significance. The existing wetlands are temporarily saturated during spring conditions, with a ponded area extending along the gravel drive at the northeastern portion of the site. The wetlands were delineated in the fall of 2003.

A proposed gravel drive with associated parking for 14 vehicles and associated trailheads will be constructed on the northeast corner of the site utilizing the existing gravel access road. This parking area and trailheads will alter wetlands in the northerly side of the property. Proposed grading of a portion of the existing ponded wetland area, as well as a partial filling of associated wetlands is proposed in the northern section of the property's entrance. The location of the proposed parking was identified through the elimination of alternative schemes. The number of alternative schemes was greatly reduced by the site's existing topography and inert fill. Those alternatives that were considered were not safe or conducive to internal circulation of the dog park.

The rest of the wetlands will be altered as a result of construction of the trailheads extending from the gravel parking area in a southwesterly direction. Drainage culverts are proposed in this portion of the fill area to allow for continued drainage between existing wetland locations. Due to the high degree of use that is anticipated for the Dog Park all year round, wood-deck structures rather than culverts within the low value wetland were considered not to outweigh the costs of maintaining such structures in a public park. Filled slopes in both areas of impact have been designed with minimization of total fill balanced with public safety.

In conclusion, the site's existing topography restricts proposed development in areas other than what has been proposed. Significant elevation changes associated with the inert fill, coupled with the proposed utilization of the current gravel entrance make the proposed parking area the most feasible area for the development of the dog park.





PHOTOGRAPH #1: Looking west into the site's wetland area.



PHOTOGRAPH #2: Southeast view of standing water near the proposed southeast corner of the gravel parking area.

**Sebago Technics**  
Engineering. Inspection. You Can Build On.

One Chabot Street  
 Westbrook, ME 04098-1339  
 Tel. (207) 856-0277

## Portland Dog Park

LOCATION:  
 Ocean Avenue  
 Portland, Maine

APPLICATION BY:  
 City of Portland  
 Portland, Maine

TAKEN BY: Grant E. Austin

SCALE:

DATE: November 14, 2003

SHEET:

1 of 2



PHOTOGRAPH #3: View of wetland associated with the proposed trailhead heading southwest.



PHOTOGRAPH #4: Wetlands adjacent to the existing gravel road in the area of the proposed parking area.

 <p>One Chabot Street Westbrook, ME 04098-1339 Tel. (207) 856-0277</p>	<h2>Portland Dog Park</h2>		SCALE:
			DATE: November 14, 2003
LOCATION:	TAKEN BY: Grant E. Austin	APPLICATION BY:	SHEET:
Ocean Avenue Portland, Maine	City of Portland Portland, Maine		1 of 2

OFFICE COPY  
3.85

August 14, 2003  
94393

Denise Albert, Director  
Parks & Recreation  
City of Portland  
17 Arbor Street  
Portland, ME 04103

**Site Investigation - Ocean Avenue Parcel, Off-Leash Area Dog Park**

Dear Denise:

I appreciated the opportunity to meet with you recently regarding a 16 acre parcel located off Ocean Avenue adjacent to the previously closed Ocean Avenue Landfill. We understand that the City of Portland has undertaken a study to evaluate the potential to construct an off-leash dog park area on this parcel that would be open to the residents of the City of Portland. As shown on the enclosed area plan, the site fronts Ocean Avenue and is situated within a perimeter road that accesses the closed portion of the Ocean Avenue Landfill.

This portion of the Ocean Avenue property is predominately wooded with inclusions of open field area. Tree growth is a mixture of hard and soft woods varying in age and size. During the initial planning for this facility, we understand that site reconnaissance completed by the City suggests that some of the landforms and surface debris may be indicative of buried waste materials within the development area. I also understand that a site walk was completed with Randy McMullin of the Maine Department of Environmental Protection (MDEP) to review the general area. Based on communications with you, it appears that nothing conclusive was determined during that site walk and that further site investigations may be warranted.

In follow-up to this, Sebago Technics was retained to assist the City in evaluating the site to determine the probable extent and type of material that may have been buried and disposed of in this proposed off-leash area. The following report provides a summary of our findings and evaluation work completed.

**Site Description and Background**

The area evaluated is approximately 16 acres in size and is bounded by a perimeter access road from Ocean Avenue. The enclosed map depicts the general area and is based upon aerial mapping completed by the City of Portland. Topography varies from moderate to steeply sloping areas and generally climbs in elevation toward the west. Vegetation is a mixture of hardwoods, softwoods, and inclusions of open field/scrub/shrub areas.

We also observed some areas of probable wetlands located at the toe of slope where drainage has accumulated. The Ocean Avenue Landfill (approximately 30 acres) is located westerly of this site and was closed in the mid to late 1970s, which included grading, shaping and capping with approximately 18" of a mineral soil material. In the mid 1990s, the MDEP pursued formal closure of this section of the Ocean Avenue Landfill. Through a series of negotiations, the City was able to officially get the status of this landfill designated as closed in compliance with State regulations in force at the time the landfill had been capped. The area of the dog park was not evaluated since it was overgrown and not considered part of the original Ocean Avenue Landfill.

The enclosed map depicts the general topographical and physical conditions based upon aerial mapping. In addition, the proposed location of the off-leash area is identified on the plan.

#### Site Investigation and Test Pit Program

On July 10, 2003 and again on August 12, 2003, Sebago Technics monitored test pit excavations within suspect areas of the off-leash area. The City of Portland's Parks Department provided a wheeled backhoe to assist in excavating test pits. Multiple test pits were excavated in areas that appeared suspect for material disposal. Test pits were generally excavated to a depth of approximately 6' to identify and characterize any buried waste and soil conditions. Locations selected for test pits were based upon site reconnaissance and landforms which appeared to be manmade due to the variable topography and type of vegetation. In general, two predominate areas appeared to have been filled and hummocked, creating a mounded landform of approximately 20 to 30 feet in height. These areas are identified as the extent of probable waste on the attached plan.

Test pits excavated in Area A (see enclosed plan) suggest the typical profile of .5' to 2' of a silty to loamy sand material with some debris mixed in with the soil. Below 2', varying amounts of solid waste were encountered and mixed with a common borrow material. Solid waste encountered included cobbles and boulder fragments, blasted rock, metal debris, construction and demolition debris, and municipal solid waste (MSW). In each of these test pits, the soil was dense and heavily compacted making excavation difficult. In addition, the predominate material was a common borrow with varying amounts of solid waste intermixed with soil. Given the landforms, it is anticipated that the mineral soil/solid waste extended to a depth of 20 to 30 feet, depending on the location.

A second area (labeled Area B on the enclosed plan) is also suspect of containing solid waste materials. Test pits excavated in this area suggest one foot or less of a loamy sand material. Below this elevation, a clean, inert fill material was predominately encountered consisting of sand, gravel, common borrow, cobbles and blasted rock. Test pits revealed some isolated instances where small pockets of miscellaneous solid waste were encountered. The majority of material encountered (95%, or greater) was an inert, clean fill material as described above.

### Findings and Summary

Our evaluation suggests two areas of concern that appear to have been landfilled in the past. Area A, which encompasses approximately 6 to 8 acres, was found to contain inert material such as common borrow, rock, cobbles and mineral soil, along with inclusions of MSW and construction/demolition debris material. Observations suggest that mineral soil and inert materials are, by volume, the predominate material present (estimated 80% or more). We did, however, identify MSW at varying depths and occasionally near the surface with little or no cover. The probable extent of this area is identified on the attached plan. As shown on the plan, this encompasses the majority of the area identified for the off-leash dog park. Given our findings in this area, we are concerned that there is an elevated potential for human/animal exposure to solid waste materials. This is especially true given that some material is at or near the surface and would be easily accessible to an animal digging into the surface materials. In addition, it may be subject to MDEP Solid Waste Management regulations. The City may want to determine whether or not to make formal contact with the MDEP to review the findings of our site evaluation and determine if further work is needed, or if the site is subject to the landfill closure regulations under Maine's Solid Waste Management regulations.


Area B, which is located closer to Ocean Avenue, appears to be limited to the landfilling of inert materials. Test pits revealed a soil profile containing a mixture of rock, cobbles, mineral soil, common borrow and blasted rock. We did observe a couple of inclusions of MSW materials, but these occurrences were sporadic and appeared to be the exception. In general, this area appears to offer a low environmental risk since the predominate material encountered is inert in nature. Inert materials are not typically regulated under the Maine Solid Waste Management regulations since they have little or no environmental risk. Based upon our review, this area would seem more appropriate as an off-leash area as it pertains to environmental risk.

We have enclosed with this letter a plan indicating the test pit locations and probable limits of landfilled material. It is important to note that the limits are approximate and based upon test pit exploration, site reconnaissance, and review of landforms that appear to have been manmade. In addition, the age of vegetation seems to coincide with the landforms and landfill areas. Based upon our evaluation, we believe Area B offers the least environmental risk for use as an off-leash area. Area A is a larger area and contains a heightened risk of environmental exposure to solid waste and is, therefore, not recommended for use as an off-leash area. Based upon our review of the site, we have established a limit of "useable area" that either appears to have been landfilled with inert materials, or has no apparent signs of landfilling activities.

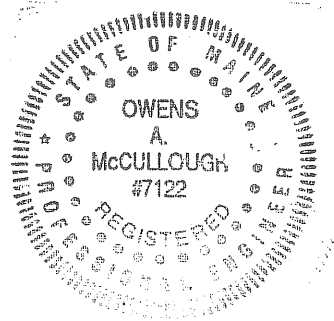
Upon your review of this report, please feel free to contact me if you have any questions or we can be of further assistance.

Sincerely,

SEBAGO TECHNICS, INC.



Owens A. McCullough, P.E.  
Sr. Project Manager



OAM:jc

Attachments:

Test Pit Logs, Exhibit A, Exhibit B





STATE OF MAINE  
 17 State House Station  
 Augusta, ME 04333

T

IN THE MATTER OF

CITY OF PORTLAND  
 Portland, Cumberland County  
 OCEAN AVENUE DOG PARK  
 L-21681-TB-A-N (approval)

) NATURAL RESOURCE PROTECTION ACT  
 ) FRESHWATER WETLAND ALTERATION  
 ) WATER QUALITY CERTIFICATION  
 ) FINDINGS OF FACT AND ORDER

Project Description: The applicant proposes to fill 6,404 square feet of forested wetlands to construct a gravel drive, 14-space parking area and trailheads as part of a 9 acre dog park located on the west side of Ocean Avenue in the City of Portland. The proposed park, with the wetland impacts, is shown on a set of plans with the first sheet entitled, "Site Plan of Portland Dog Park", drawn by Sebago Technics and dated November 18, 2003, with the latest revision date of any sheet of February 11, 2004. In order to avoid and minimize impacts to the greatest extent practicable, the applicant examined several design alternatives. The selected alternative limits wetland impacts by developing areas along the wetland edge and minimizing side slopes of the road and trails.


<b>Permit for:</b>	<input checked="" type="checkbox"/> Tier 1	<input type="checkbox"/> Tier 2
<b>DEP Decision:</b>	<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Denied (see attached letter)
<b>CORPS Action:</b>	<input checked="" type="checkbox"/> The Corps has been notified of your application. The following are subject to Federal screening: (1) projects with previously authorized or unauthorized work, in combination with a Tier 1 permit for a single and complete project, which total more than 15,000 square feet of altered area; (2) projects with multiple state permits and/or state exemptions which apply to a single and complete project that total more than 15,000 square feet of altered area; and (3) projects that may impact a vernal pool, as determined by the State of Maine or the Corps. If your activity is listed above, <i>Corps approval is required for your project.</i> For information regarding the status of your application contact the Corps' Maine Project Office at 623-8367.	

Standard Conditions:

- 1) If construction or operation of the activity is not begun within two (2) years from the date signed, this permit shall lapse and the applicant shall reapply to the Department for a new permit. This permit is transferable only with prior approval from the Department. If the activity is associated with a larger project, starting any aspect of that project constitutes start of construction.
- 2) The project shall be completed according to the plans in the application. Any change in the project plans must be reviewed and approved by the Department.
- 3) Properly installed erosion control measures shall be installed prior to beginning the project, and all disturbed soil should be stabilized immediately upon project completion.
- 4) A copy of this approval will be sent to the City of Portland. Department approval of your activity does not supersede or substitute the need for any necessary local approvals.

Please note the attached sheet for guidance on appeal procedures.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

  
 \_\_\_\_\_  
 DAWN R. GALLAGHER, COMMISSIONER

3/4/04  
 \_\_\_\_\_  
 DATE

FILED

MAR - 4 2004

BOARD OF ENVIRONMENTAL PROT.  
STATE OF MAINE

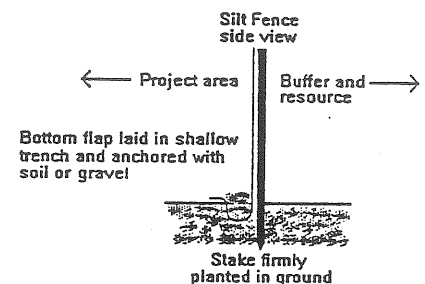
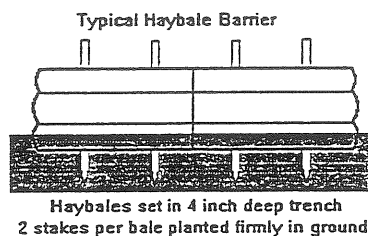
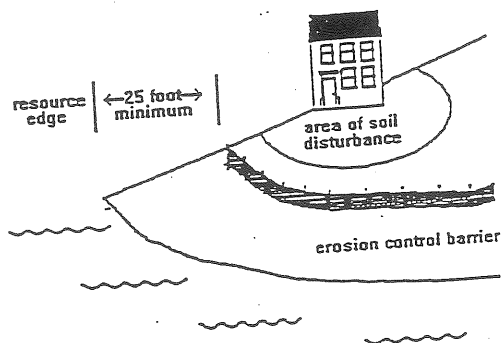
Date of initial application 01/20/04  
 Date application accepted for processing 02/10/04  
 Date filed with Board of Environmental Protection  
 RLG/T#L21681AN



## Erosion Control

### Before Construction

1. If you have hired a contractor, make sure you have discussed your permit with them. Talk about what measures they plan to take to control erosion. Everybody involved should understand what the resource is and where it is located. Most people could identify the edge of a lake or a river. The edges of wetlands, however, are often not obvious. Your contractor may be the person actually pushing dirt around but you are both responsible for complying with the permit.
2. Call around and find sources for your erosion controls. You will probably need silt fence, hay bales and grass seed or conservation mix. Some good places to check are feed stores, hardware stores, landscapers and contractor supply houses. It is not always easy to find hay or straw during late winter and early spring. It may also be more expensive during those times of year. Plan ahead. Purchase a supply early and keep it under a tarp.
3. Before any soil is disturbed, make sure an erosion control barrier has been installed. The barrier can be either a silt fence, a row of staked hay bales, or both. Use the drawings below as a guide for correct installation and placement. The barrier should be placed as close as possible to the activity.
4. If a contractor is installing the barrier, double check it as a precaution. Erosion control barriers should be installed "on the contour", meaning at the same level along the land slope, whenever possible. This keeps stormwater from flowing to the lowest point of the barrier where it builds up and overflows or destroys it.



### During Construction

1. Use lots of hay or straw mulch on disturbed soil. The idea behind mulch is to prevent rain from striking the soil directly. It is the force of raindrops striking the soil that causes a lot of erosion. More than 90% of erosion is prevented by keeping the soil covered.
2. Inspect your erosion control barriers frequently. This is especially important after a rainfall. If there is muddy water leaving the project site, then your erosion controls are not working as intended. In that situation, stop work and figure out what can be done to prevent more soil from getting past the barrier.

### After Construction

1. After the project is complete, replant the area. All ground covers are not equal. For instance, a mix of creeping red fescue and Kentucky bluegrass is a good choice for lawns and other high maintenance areas. The same mix would not be a good choice for stabilizing a road shoulder or a cut bank that you don't intend to mow.
2. If you finish your project after September 15, then do not spread grass seed. There is a very good chance that the seed will germinate and be killed by a frost before it has a chance to become established. Instead, mulch the site with a thick layer of hay or straw. In the spring, rake off the mulch and seed the area. Don't forget to mulch again to hold in moisture and prevent the seed from washing away.
3. Keep your erosion control barrier up and maintained until the area is permanently stabilized.





Central Maine Power Company  
83 Edison Drive, Augusta, Maine 04336

(207) 623-3521

Real Estate Services

July 13, 2000

Sarah Hopkins  
Planning and Urban Development  
City Hall  
389 Congress Street  
Portland, ME 04101

Re: Proposal by Dragon Products for Relocation of Plant at 960 Ocean Avenue,  
Tax Map 416A, Lot A-2; Map 417, Lots A-4, 5, 10, 11; Map 418, Lots A-1,  
3, 4, 5, 6, 9 and 10

Dear Ms. Hopkins:

This letter is in response to the Notice of the above proposed development. As you are aware, Central Maine Power Company has rights in a transmission line corridor in the vicinity of Dragon Products. The width of CMP's corridor varies in this location, but is generally 135 feet wide. For your information, I am enclosing a marked-up copy of CMP's plan and profile map that corresponds with this location. The parcels over which CMP has easement rights only contain a covenant in the conveying deed wherein the Grantor agreed, for himself and his heirs and assigns, to "not erect or maintain any structure of any kind on said strip."

Central Maine Power Company has no objection to Dragon Products' proposed development as long as it does not impact on CMP's property.

If you have any questions, please do not hesitate to call me at the number listed below.

Sincerely,

Donna-Mae Bean  
Associate Real Estate Agent  
(207) 621-3872

Enc.



Post-It® Fax Note	7671	Date	3/2/98	# of pages	5
To	Chris Neagle	From	Natalie Burne		
Co./Dept.	Hessell + Burns	Co.	City of Portland		
Phone #		Phone #	874-8480		
Fax #	774-7499	Fax #			

OCEANAV.REZ.CON 3/2/98  
02.19.98

NOT YET  
REVIEWED  
BY STAFF

AGREEMENT BETWEEN  
CITY OF PORTLAND  
AND

DRAGON PRODUCTS, INC.

AGREEMENT made this day of , 1998 by and between the CITY OF PORTLAND, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "CITY") and DRAGON PRODUCTS, INC., a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 (hereinafter "DRAGON").

W I T N E S S E T H:

WHEREAS, DRAGON did request a rezoning of property located at Ocean Avenue, in Portland, in order to permit the expansion of its existing legally nonconforming mining operation and on the site of its legally nonconforming cement plant; and

WHEREAS, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the property as aforesaid, subject, however, to certain conditions; and

WHEREAS, the CITY by and through its City Council has determined that said rezoning would be pursuant to and consistent with the CITY'S comprehensive land use plan and consistent with the existing and permitted uses within the original zone; and

OCEANAV.REZ.CON  
02.19.98

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose by agreement the following conditions or restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the CITY authorized the execution of this Agreement on , 1998;

NOW, THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

- 1. The CITY shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by adopting the map change amendment shown on Attachment 1. *(what is this?)*

Dragon site plan?

- 2. The property shall be developed substantially in accordance with the site plan and elevations shown on Attachment 2; provided, however, that such plan and elevations shall be subject to full site plan review by the Planning Board. *if required by City ordinances.*

mining of stone for use in manufacture of concrete on the site

- 3. DRAGON shall be authorized to establish and maintain only those uses or any combination of the uses listed below:

- a. ~~mining operations~~, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth herein and established by State and Federal law.
- b. ~~general~~ concrete manufacture and processing.
- c. Storage of materials utilized in the manufacturing allowed on the site, material manufactured on the site and related machinery and equipment, provided that such storage is limited to the areas shown on Attachment 2. Rock storage shall be relocated from

*d. Noise standards in §267(2) shall not apply to blasting.*  
*e. The concrete plant shall be allowed to generate upto 78 decibels along Ocean Avenue. Otherwise, only 65 decibels of noise shall be allowed at property lines.*

*d. The Buffer strip shall remain in its existing natural condition.*

OCEANAV.REZ.CON  
02.19.98

its current site to the areas shown on Attachment 2.

4. DRAGON shall relocate the rock crusher from its current location to the rear of the site, as indicated on Attachment 2.
5. DRAGON shall relocate the conveyor belt to the concrete plant to the rear of the site, as indicated on Attachment 2, *within 5 years of this Agreement.*
6. DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. All blasting on the site shall occur between the hours of 7:00 a.m. and 4:00 p.m., *and between ~~April~~ and November, <sup>March</sup>*
7. DRAGON shall *hose down* wash trucks on the site to reduce the amount of debris and residue tracked on the street.
8. DRAGON shall route all trucks exiting the site and traveling inbound to Portland to Presumpscot Street, unless such trucks are making deliveries to sites located between this site and Washington Avenue, or unless Presumpscot Street is unavailable for truck traffic due to road maintenance or construction. *(do you want to add specifics from noise, vibration, blasting + reclamation?)*
9. DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding operations on its site, including but not limited to blasting, *as set forth in 38 MRS.A §§490-W to 490EE. <sup>mining</sup>*
10. DRAGON shall meet all standards contained in sections 14-265, 14-266, and 14-267, ~~unless such standards are explicitly amended herein.~~
11. DRAGON shall maintain ownership of all property currently owned by it at this site and also the parcel owned by Dragon and located across Ocean Avenue from this site. *(map 418A, Block A, Lots 5 + 12)*

*delete*

The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with the subject premises, shall bind DRAGON, its successors and assigns, as permitted by this Agreement, of said property or any part thereof or interest therein, and any party in possession or occupancy of

- except as follows:*
- a. No new fence shall be required pursuant to <sup>§</sup>266(6)
  - b. Outside storage of stone shall not be required to meet the standards of §266(10)

*c. Vibration standards in §267(3) shall not apply to blasting*

"Redlined" changes from 1-28-99 draft by City

AGREEMENT BETWEEN  
CITY OF PORTLAND  
AND  
DRAGON PRODUCTS, INC.

AGREEMENT made this \_\_\_\_ day of \_\_\_\_\_, ~~1999~~2000 by and between the CITY OF PORTLAND, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "CITY") and DRAGON PRODUCTS COMPANY, INC., a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 (hereinafter "DRAGON").

WITNESSETH:

WHEREAS, DRAGON did request a rezoning of property located at Ocean Avenue, in Portland, in order to permit the expansion of its existing legally nonconforming mining operation and on the site of its legally nonconforming ~~cementconcrete~~concrete plant; and

WHEREAS, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the property as aforesaid, subject, however, to certain conditions; and

WHEREAS, the CITY by and through its City Council has determined that said rezoning would be pursuant to and consistent with the CITY'S comprehensive land use plan and consistent with the existing and permitted uses within the original zone; and

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose by agreement the following conditions or

restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the CITY authorized the execution of this Agreement on \_\_\_\_\_,  
~~1999~~2000;

NOW, THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The CITY shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by adopting the map change amendment shown on Attachment 1. (Is this a plan the City will produce?)
2. The property ~~shall~~may be developed substantially in accordance with the site plans and elevations shown on Attachment 2; including relocating the concrete plant, storage silos, and rock crusher, provided, however, that such plan ~~and elevations~~development shall be subject to full site plan review and approval by the Planning Board, ~~if required by City ordinances.~~
3. DRAGON shall be authorized to establish and maintain only those uses or any combination of the uses listed below:
  - a. Mining and crushing of stone for use in manufacture of concrete on the site, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth herein and established by State and Federal law.
  - b. Concrete manufacture and processing.
  - c. ~~S~~Outdoor storage of materials utilized in the concrete manufacturing ~~allowed on the site,~~ material manufactured on the site (including concrete blocks produced as an incidental part of its operations) and related machinery and equipment, provided that such storage is limited to the areas shown on Attachment 2. Rock storage shall be relocated from its current site to the areas shown on Attachment 2.
  - ~~d. The buffer strip shown on Attachment 2 shall remain in its existing natural condition.~~
4. Prior to the commencement of any mining, Dragon shall obtain from the City a Certificate of Occupancy, verifying that the site alterations of the project as

approved by the Planning Board, including the relocation of the concrete plant and the removal from the site of old, unused equipment and buildings, etc. have been completed to the satisfaction of the City in accordance with this Agreement.

5. If the Certificate of occupancy is not issued within five (5) years of the date of final site plan approval by the Planning Board, this rezoning agreement shall automatically terminate and the land shall automatically revert to the R-3 or any successor zone classification.
6. DRAGON shall construct ~~the~~ a densely vegetated berm and fencing along that portion of the property abutting Ocean Avenue, as indicated on Attachment 2.
7. The natural vegetation existing in the Permanent Buffer Zone along the perimeter of the property proposed quarry expansion shall remain in its natural state, as indicated on Attachment 2. This area, or any portion of it, may not be separately conveyed apart from the property as a whole.
- ~~8. DRAGON shall address to the satisfaction of the Planning Department and Public Works, the existing substandard stormwater condition on Ocean Avenue adjacent to its parcel, including building an adequate drainage ditch along Ocean Avenue, and shall thereafter confine surface water runoff within its site. Pavement and stormwater infrastructure along Ocean Avenue and adjacent to this site parcel shall be repaired and maintained by DRAGON as required by Public Works.~~
- ~~9. DRAGON shall relocate the rock crusher from its current location to the rear of the site, as indicated on Attachment 2.~~
- ~~10. DRAGON shall relocate the entrance/ingress/egress driveway to the premises, and shall create a slip lane for slowmoving traffic along ocean Avenue as indicated on Attachment 2.~~
- ~~11. DRAGON shall relocate the concrete batch plant and the conveyor belt to the concrete batch plant to the rear of the site, as indicated on Attachment 2, within five years of the date of this Agreement.~~
- ~~12. DRAGON shall relocate the silos to the rear of the site, as indicated on Attachment 2.~~
13. DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. In no event shall more than ~~three~~ four (34) individual blasts per month be permitted. All blasting on the site shall occur on Monday through Saturday between the hours of 7:00 a.m. and 4:00 p.m. and between the months of March and November.
- ~~14. All mining operations on-site shall be conducted within the building envelope indicated on Attachment 2.~~



150. DRAGON shall hose down its trucks ~~on the at the rear of~~ before exiting the site to reduce the amount of debris and residue tracked on the street.

start →

161. DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding mining operations on its site, including but not limited to blasting and reclamation, as set forth in 38 M.R.S.A. §§490-W to 490EE, attached hereto and incorporated herein, except, where municipal standards adopted by the CITY are more restrictive, the CITY standards shall apply.

172. Reclamation shall be completed substantially in accordance with the reclamation plan as indicated on, Attachment 3; provided, however, that such plan shall be subject to full review and approval by the Planning Board, if required by City ordinances.

183. DRAGON shall meet all standards contained in sections 14-265, 14-266, and 14-267 of the Portland City Code, except as follows:

- a. No new fence shall be required pursuant to 14-266(6) except as shown on Attachment 2 as may be required by the Planning Board during final site plan review.
- b. Outside storage of stone shall not be required to meet the standards of §14-266(10).
- c. Vibration standards in 14-267(3) shall not apply to blasting.
- d. Noise standards in §14-267(2) shall not apply to blasting.
- e. The existing concrete plant shall be allowed to generate 78 decibels along the Ocean Avenue frontage until it is relocated, but shall be limited to 65 decibels of noise as measured at property lines in accordance with the procedures set forth in §14-267(2).

194. Until it has relocated the concrete plant, DRAGON shall maintain ownership of all property currently owned by it at this site and also the parcels owned by Dragon and located across Ocean Avenue from this site, more particularly described as Tax Map 418, Block A, Lots 5 and 12 in the records of the Assessor of the City of Portland.

~~20. This contract shall automatically terminate upon the conveyance of this property by DRAGON to another owner or entity and the area shall automatically revert to R-3 or any successor zone classification.~~



The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with and bind the subject premises, shall bind DRAGON, its successors and assigns, as ~~permitted by this Agreement,~~owner of said property or any part thereof or interest therein, and any party in possession or occupancy of said property or any part thereof, and shall inure to the benefit of and be enforceable by the CITY, by and through its duly authorized representatives.

If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of the remaining portions hereof.

Except as expressly modified herein, the use and occupancy of the subject premises shall be governed by and comply with the provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

In the event that the CITY claims that DRAGON or any successor fails to continue~~has failed~~ to utilize the property in accordance with this Agreement, or ~~in the event of a~~otherwise breach ~~of~~ed any conditions set forth in this Agreement, the Planning Board shall have the authority, after hearing, ~~to resolve the issue resulting in the breach or the failure to operate. The resolution may include~~giving DRAGON a hearing and opportunity to be heard, to determine whether any breach has occurred. Appeals of the Planning Board decision shall be resolved by binding arbitration. If DRAGON does not correct any breach of this Agreement within 30 days of the arbitration decision, then the Planning Board may make a recommendation to the City Council that the site be rezoned to R-3 or any successor zone and that this Agreement be terminated, requiring a cessation of the blasting use permitted under this terms of this

Agreement. However, the termination of the contract will not require cessation of the concrete and cement processing and manufacturing and processing uses located on the site prior to the date of execution of this contract, or as relocated pursuant to this Agreement.

WITNESS:

CITY OF PORTLAND

\_\_\_\_\_

By: \_\_\_\_\_

Robert B. Ganley  
Its City Manager

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 19992000

Personally appeared the above-named Robert B. Ganley, in his capacity as City Manager, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the City of Portland.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

WITNESS:

DRAGON PRODUCTS COMPANY, INC.

\_\_\_\_\_

By: \_\_\_\_\_

Its \_\_\_\_\_

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 19992000

Personally appeared the above-named \_\_\_\_\_, in his/her said capacity and acknowledged the foregoing instrument to be his/her free act and deed and the free act and deed of Dragon Products, Inc.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

Draft: March 30, 2000  
P:\CSN\DRAGON\Portland.agr-red.wpd

**AGREEMENT BETWEEN  
CITY OF PORTLAND  
AND  
COZY HARBOR, INC.**

**AGREEMENT** made this      day of      , 1995 by and between the **CITY OF PORTLAND**, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "**CITY**") and **COZY HARBOR, INC.**, a Maine corporation located in of Portland, Maine (hereinafter "**COZY HARBOR**").

**W I T N E S S E T H:**

**WHEREAS**, **COZY HARBOR** did request a rezoning of property located at 75 St. John Street, in Portland, in order to permit the operation of a seafood and shellfish processing operation and 75 St. John Street Corporation, the current owner of the property, supports such a rezoning in order to allow **COZY HARBOR** to purchase the property and to conduct such operation; and

**WHEREAS**, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the property as aforesaid, subject, however, to certain conditions; and

**WHEREAS**, the **CITY** by and through its City Council has determined that said rezoning would be pursuant to and consistent with the **CITY'S** comprehensive land use plan and consistent with the existing and permitted uses within the original zone; and

**WHEREAS**, the **CITY** has determined that because of the unusual nature of the proposed development it is necessary or appropriate

to impose by agreement the following conditions or restrictions in order to insure that the following conditions or restrictions in order to insure that the rezoning is consistent with the **CITY'S** comprehensive land use plan; and

**WHEREAS**, the **CITY** authorized the execution of this Agreement on \_\_\_\_\_, 1995;

**NOW, THEREFORE**, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The **CITY** shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by adopting the map change amendment shown on Attachment 1.
2. The property located at 75 St. John Street is hereby authorized to operate a seafood and shellfish processing operation, to include specifically cleaning, cutting and packaging of groundfish and cleaning, cutting, steaming and packaging of shrimp and lobster or for any use permitted in the existing I-2b zone or any successor zone. Any type of processing other than those specifically enumerated in this paragraph will require the prior approval of the Planning Board following a public hearing.
3. The property shall be developed substantially in accordance with the site plan shown on Attachment 2.
4. **COZY HARBOR** or any subsequent operator shall maintain and upon request provide proof of regular inspection services by the National Marine Fisheries Service, the Food and Drug Administration, or the Maine Department of Marine Resources, or shall submit a federally approved Hazard Analysis Critical Control Plan (HACCP) or its equivalent.
5. All seafood and shellfish handling and processing shall occur within the processing building.

6. All seafood and shellfish processing waste shall be stored within the processing building and if not refrigerated shall be removed from the site in an enclosed container within forty-eight (48) hours of its generation.
7. Enclosed and exterior areas shall be cleaned and sanitized on a daily basis so as to prevent the generation of odors that are perceived as offensive at lot boundaries.
8. The seafood and shellfish processing facility shall have a valid wastewater discharge permit as required by the City of Portland regulations.
9. Between the hours of 8:00 p.m. and 7:00 a.m., any truck run on the site for more than one (1) hour must do one (1) of the following:
  - a. Operate the refrigerator units on electrical standby;
  - b. Operate the refrigeration units on a noise reduction mode; or
  - c. Shut off diesel refrigeration units.

The level of sound, measured by a sound level meter with frequency weighting network (manufactured according to standards prescribed by the American National Standards Institute, Inc.), inherently and recurrently generated between the hours of 8:00 p.m. and 7:00 a.m. from uses on the site shall not exceed fifty-five (55) decibels on the A scale at and within the boundaries of any residential zone.

10. In addition to the standards set forth in this Agreement, the site shall also be subject to all other requirements of the I-2b zone or the requirements of any successor zone in effect at the time of application for site plan approval.

The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with the subject premises, shall bind COZY HARBOR, its successors and assigns, of said property or any part thereof or interest therein, and any

party in possession or occupancy of said property or any part thereof, and shall inure to the benefit of and be enforceable by the **CITY**, by and through its duly authorized representatives.

If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of the remaining portions hereof.

Except as expressly modified herein, the use and occupancy of the subject premises shall be governed by and comply with the provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

In the event that **COZY HARBOR** or any successor fails to continue to operate a seafood or shellfish processing operation in accordance with this Agreement, or in the event of a breach of any condition(s) set forth in this Agreement, the Planning Board shall have the authority, after hearing, to resolve the issue resulting in the breach or the failure to operate. The resolution may include a recommendation to the City Council that the site be rezoned to I-2b or any successor zone.

WITNESS:

\_\_\_\_\_

**CITY OF PORTLAND**

By \_\_\_\_\_  
Robert B. Ganley  
Its City Manager

WITNESS:

COZY HARBOR, INC.

By \_\_\_\_\_  
John Norton  
President

STATE OF MAINE  
CUMBERLAND, ss.

, 1995

Personally appeared the above-named Robert B. Ganley, in his capacity as City Manager, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the City of Portland.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law



STJOHNSTREZ.CON.002  
08.17.95

STATE OF MAINE  
CUMBERLAND, ss.

, 1995

Personally appeared the above-named John Norton, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of Cozy Harbor, Inc.

Before me,

---

Notary Public/Attorney at Law

## DRAGON PRODUCTS COMPANY, INC. AGREEMENT

This document is an Agreement made by **DRAGON PRODUCTS COMPANY, INC.**, a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 ("DRAGON").

WHEREAS, DRAGON requested a rezoning of its property located at Ocean Avenue, in the **City of Portland**, a Maine municipality located in Cumberland County and State of Maine ("CITY" or "Portland") in order to permit the expansion of its existing legally nonconforming mining operation on the site of its legally nonconforming concrete plant; and

WHEREAS, DRAGON'S property is shown on Portland Assessor's Parcels: Map 416-A, Block A, Lot 2; Map 417, Block A, Lots 4, 5, 10 and 11; and Map 418, Block A, Lots 1, 3, 4, 5, 6, 9 and 10 ("Property"); and

WHEREAS, the Portland Planning Board, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberations, recommended the rezoning of the Property, subject, however, to certain conditions; and

WHEREAS, the CITY, by and through its City Council, has determined that the rezoning would be pursuant to and consistent with the CITY'S comprehensive land use plan and consistent with the existing and permitted uses within the original R-3 zone; and

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose the following conditions or restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the following plans and documents are attached to this Agreement and incorporated into this Agreement by reference:

Attachment 1: City Zoning Map change **(to be prepared by City)**

Attachment 2: Quarry Plan View (F-1) dated June 5, 2000

Attachment 3: Plan View of Proposed Berm (F-2) dated June 5, 2000

Attachment 4: Ocean Avenue Longitudal and Cross Sections (F-3) dated June 5, 2000

Attachment 5: Reclamation Standards for Portland Quarry

Attachment 6: Maine DEP Performance Standards for Quarries (20 pages)

Attachment 7: Blasting Plan (5 pages)

Attachment 8: Protocol for Complaints and Resolutions

NOW, THEREFORE, in consideration of the zone change made by the CITY, DRAGON hereby agrees as follows:

1. Site Development: The Property shall be developed substantially in accordance with the site plans and elevations shown on Attachments 2-4. DRAGON shall:

a. Remove the existing batch plant and silos, truck fuel depot, conveyor, concrete retaining wall and temporary ditch, and rock crushing facility.

b. Relocate its batch plant and related operations no closer than 350 feet to Ocean Avenue, in the "approximate limit of operation area" shown on Attachment 2.

c. Locate the new rock crusher facility no closer than 750 feet to Ocean Avenue than the operations area shown on Attachment 2, and enclose any rock crushing operations within an insulated building.

d. A new earthen berm, fence, paved entrance, drainage ditch, and climbing lane will be developed along the west side of Ocean Avenue as shown on Attachments 2-4. The final berm design, landscape planting and schedule will be determined by the Planning Board in its site plan

review, after consultation with the City Arborist.

e. DRAGON shall relocate the entrance driveway to the premises, and shall create a slip lane for slow-moving traffic along Ocean Avenue as shown on Attachments 2 and 3. To the extent that any of the new roadway or drainage improvements are located on land of DRAGON, it will deed that portion of its land to the CITY.

f. Develop a stormwater management plan for the entire site, including all improvements along Ocean Avenue and within the operations area according to MeDEP performance standards.

Provided, however, that such development shall be subject to full Site Plan review and approval by the Planning Board, which may approve modifications to these plans as part of the review process.

2. Authorized Uses: DRAGON shall only be authorized to establish and maintain the following uses or any combination of the uses on the Property, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth in this Agreement and established by State and Federal law:

a. Mining of stone in the "quarry expansion area", including blasting, and crushing of stone for use in manufacture of concrete on the site.

b. Concrete manufacture and processing.

c. Outdoor storage of materials, including rock piles utilized in the concrete manufacturing, material manufactured on the site, including concrete blocks produced as an incidental part of its operations, and related machinery and equipment.

e. All concrete trucks shall be hosed down before exiting the operations area on the Property to reduce the amount of debris and residue tracked onto Ocean Avenue.

f. Vehicle repair and storage and office operations within the existing Dragon Products Company garage facilities (3 bays) shown on Attachment 2.

3. Timing of Uses on Property: Prior to the commencement of any blasting, mining or rock crushing, Dragon shall obtain from the City a Certificate of Occupancy, verifying that all site alterations described in Section 1 and as otherwise approved by the Planning Board have been completed. DRAGON shall discontinue use of its existing batch plant within 30 days of its new batch plant being fully operational, and shall remove its existing batch plant from the Property within 180 days of its use being discontinued.

4. Time Limit for Certain Site Improvements: Dragon shall apply for Site Plan Approval for the site changes described in Section 1 (a, c-f) (all site improvements except the rock crusher) within one year of the final approval of this Agreement by the City Council, and shall complete all approved site improvements within two years of final Planning Board approval of the site plan, or this contract shall automatically terminate and the Property shall automatically revert to the R-3 or any successor zone classification.

5. Natural Buffer Areas: The existing trees and other natural vegetation in the "existing wooded buffer strip" on the south side of the site the "existing vegetation" on the north side of the site shown on Attachment 2 shall remain in their natural state. These areas, or any portions of them, may not be separately conveyed apart from the Property as a whole, while any blasting, mining, concrete manufacturing, or other uses not consistent with the underlying R-3 or successor zone are being conducted on the Property.

6. Limits on Blasting: DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. In no event shall more than four (4) individual blasts per month be permitted. All blasting and rock crushing on the site shall occur on Monday through Friday between the hours of 9:00 a.m. and 4:00 p.m. and between the months of March and November.

7. Blasting Operations: DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding mining operations on its site, including those set forth in 38 M.R.S.A. §§490-W to 490EE (Attachment 6) as it may be amended, except where municipal standards adopted by the CITY which are not otherwise described in this Agreement are more restrictive, the CITY standards shall apply. The MeDEP standards shall include, but not be limited to:

- a. Blasting standards described in §490-Z (14), including preblast surveys as described in subsection (F), sound standards described in subsection (H), vibration standards described in subsections (I) - (K), and blasting records as described in subsection (L), including records of peak particle velocity and decibels for each blast.
- b. Dust standards described §490-Z (12)
- c. Reclamation standards described in §490-Z (13)

All blasting shall also be conducted in accordance with the Blasting Plan, Pre-blast Inspection Procedures, Drilling and Blasting Procedures Blasting Records standards shown on Attachment 7.

8. Complaint Protocol: DRAGON shall maintain the complaint resolution protocol and City reporting protocol described in Attachment 8. Furthermore, in the event of prolonged and chronic complaints by area residents of substantial noncompliance with the terms of this Agreement by DRAGON, then the CITY may ask the MeDEP to review DRAGON's blasting operations for compliance with this Agreement. If DRAGON fails to implement any changes recommended by the MeDEP within a reasonable time period, then: (a) the CITY may hire third-party blasting engineers to conduct a 'peer review' of DRAGON's blasting operations and compliance with this Agreement, and the CITY's reasonable costs for such engineers shall be reimbursed by DRAGON; and/or (b) the CITY may seek to enforce this Agreement pursuant to Section 17.

9. Reclamation of Site: Reclamation of the Property into a vegetated, useable condition shall be completed substantially in accordance with the reclamation plan described in Attachment 5

within 2 years of completion of the mining on the Property; provided, however, that such plan shall be subject to full review and approval by the Planning Board before being implemented.

10. City Zoning Standards: DRAGON shall meet all IL zoning standards contained in sections 14-234, 14-235, and 14-236 of the Portland City Code, except as follows:

- a. No new fence shall be required pursuant to 14-235(6) except as shown on Attachments 2-4 and as may be required by the Planning Board during final site plan review.
- b. Outside storage of sand and stone shall not be required to meet the standards of §14-235(10).
- c. Vibration standards in §14-236(3) shall not apply to blasting, and IM vibration standards found in §14-252(3) shall apply to all other operations.
- d. Noise standards in §14-236(1) shall not apply to blasting.
- e. The existing concrete batch plant shall be allowed to generate 78 decibels along the Ocean Avenue frontage until it is removed from the Property, but the new concrete production building shall comply with §14-236(1) when measured at property lines of the Property.

11. IL Zoning Standards: Except as expressly modified in this Agreement, the use and occupancy of the Property shall be governed by and comply with the IL zoning provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

12. Parcels east of Ocean Avenue: As long as it operates its existing concrete batch plant, DRAGON shall maintain ownership of the parcels east of Ocean Avenue across from the Property, more particularly described as Tax Map 418-A, Block A, Lots 5 and 12 in the records of the Assessor of the City of Portland.



13. DRAGON's Successors: If DRAGON sells or transfers the Property to any new owner in the future which wants to continue the blasting, mining and concrete manufacturing operations, then any prospective new owner must receive written approval from the City of Portland Planning Department as to that owner's technical and financial abilities to comply with the terms of this contract, and the new owner must sign a copy of this Agreement agreeing to comply with all of its terms.

14. Record Notice: DRAGON agrees to record this Agreement in the Cumberland County Registry of Deeds, and to include a reference to it in any deed conveying any of the Property.

15. Enforceability: The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with and bind the subject premises, shall bind DRAGON, its successors and assigns, as owner of the Property or any part thereof or interest therein, and any party in possession or occupancy of the Property or any part thereof, and shall inure to the benefit of and be enforceable by the CITY, by and through its duly authorized representatives.

16. Severability: If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of the remaining portions hereof.

17. Default by Dragon: In the event that the CITY claims that DRAGON or any successor has failed to utilize the Property in accordance with this Agreement, then it may give DRAGON written notice of the default claimed by the CITY. **(Optional:** The City Planning Staff may seek a hearing on these issues before the Planning Board at any time.) If DRAGON does not correct the defaults in a timely manner to the CITY's satisfaction, then the CITY may a judicial enforcement action for the breach of this Agreement. If it is determined in such judicial enforcement action that DRAGON has breached this Agreement, and DRAGON fails to comply with the Agreement in a timely manner after such judicial determination, then the City Planning Staff may also recommendation to the City Council that this Agreement be terminated, requiring

a cessation of the blasting and mining use permitted under this terms of this Agreement; provided that the termination of the contract will not require cessation of the concrete manufacturing and processing uses located on the site prior to the date of execution of this Agreement, or as relocated pursuant to this Agreement.

WITNESS: DRAGON PRODUCTS COMPANY, INC.

\_\_\_\_\_ By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Its: \_\_\_\_\_

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 2000

\_\_\_\_\_, as \_\_\_\_\_ of Dragon Products Company, Inc, personally appeared before me and acknowledged that the signature on this document was his free act and deed acting on behalf of Dragon Products Company, Inc.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

Print Name: \_\_\_\_\_

Draft: July 6, 2000  
O:\PLAN\REZONE\OCEAN960\CONTRACT.CN

**AGREEMENT BETWEEN  
CITY OF PORTLAND  
AND  
DRAGON PRODUCTS, INC.**

**AGREEMENT** made this \_\_\_\_ day of \_\_\_\_\_, 1999 by and between the **CITY OF PORTLAND**, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "**CITY**") and **DRAGON PRODUCTS, INC.**, a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 (hereinafter "**DRAGON**").

**W I T N E S S E T H:**

**WHEREAS**, **DRAGON** did request a rezoning of property located at Ocean Avenue, in Portland, in order to permit the expansion of its existing legally nonconforming mining operation and on the site of its legally nonconforming cementconcrete plant; and

**WHEREAS**, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the property as aforesaid, subject, however, to certain conditions; and

**WHEREAS**, the **CITY** by and through its City Council has determined that said rezoning would be pursuant to and consistent with the **CITY'S** comprehensive land use plan and consistent with the existing and permitted uses within the original zone; and

**WHEREAS**, the **CITY** has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose by agreement the following conditions or restrictions in order to insure that the rezoning is consistent with the **CITY's** comprehensive land use plan; and

**WHEREAS**, the **CITY** authorized the execution of this Agreement on \_\_\_\_\_, 1999;

**NOW, THEREFORE**, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The **CITY** shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by adopting the map change amendment shown on Attachment 1.
2. The property shall be developed substantially in accordance with the site plan and elevations shown on Attachment 2; provided, however, that such plan and elevations shall be subject to full site plan review and approval by the Planning Board, ~~if required by City ordinances.~~
3. **DRAGON** shall be authorized to establish and maintain only those uses or any combination of the uses listed below:
  - a. Mining of stone for use in manufacture of concrete on the site, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth herein and established by State and Federal law.
  - b. Concrete manufacture and processing.
  - c. Storage of materials utilized in the manufacturing allowed on the site, material manufactured on the site and related machinery and equipment, provided



that such storage is limited to the areas shown on Attachment 2. Rock storage shall be relocated from its current site to the areas shown on Attachment 2.

take out of document but do not show strike out

~~4. The buffer strip shown on Attachment 2 shall remain in its existing natural condition.~~

Capitalize + Bold

4. Prior to the commencement of any mining, **Dragon** shall obtain from the City a Certificate of Occupancy, verifying that the site alterations of the project as approved by the Planning Board, including the removal from the site of old, unused equipment, buildings, etc. have been completed to the satisfaction of the City.

5. If the Certificate of Occupancy is not issued within five (5) years of the date of final site plan approval by the Planning Board, this rezoning agreement shall automatically terminate and the land shall automatically revert to the R-3 or any successor zone classification.

to DRAGON ← Bold

6. **DRAGON** shall construct a densely vegetated berm along that portion of the property abutting Ocean Avenue, as indicated on Attachment 2.

do not show strike out

7. The natural vegetation existing along the perimeter of the property shall remain in its natural state, as indicated on Attachment 2. This area, or any portion of it, may not be separately conveyed apart from the property as a whole.

DRAGON ← Bold

8. **DRAGON** shall address to the satisfaction of the Planning Department and Public Works, the existing substandard stormwater condition on Ocean Avenue adjacent to its parcel, including building an adequate drainage ditch along Ocean Avenue, and shall thereafter confine surface water runoff within its site. Pavement and stormwater infrastructure along Ocean Avenue and adjacent to this site parcel shall be repaired and maintained by **DRAGON** as required by Public Works.

installing

do not show deletion

the site (do not show strike)

9. **DRAGON** shall relocate the rock crusher from its current location to the rear of the site, as indicated on Attachment 2.



10. **DRAGON** shall relocate the entrance/ingress/egress driveway to the premises, and shall create a slip lane for slowmoving traffic along Ocean Avenue, as indicated on Attachment 2.

do not show deletion

- 5-11. DRAGON shall relocate the concrete batch plant and the conveyor belt to the concrete batch plant to the rear of the site, as indicated on Attachment 2, ~~within five years of the date of this Agreement.~~
12. DRAGON shall relocate the silos to the rear of the site, as indicated on Attachment 2.
- 6-13. DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. In no event shall more than three (3) individual blasts per month be permitted. All blasting on the site shall occur on Monday through Saturday between the hours of 7:00 a.m. and 4:00 p.m. and between the months of March and November.
14. All mining operations on-site shall be conducted within the building envelope indicated on Attachment 2.
- 7-15. DRAGON shall hose down its trucks on the at the rear of the site to reduce the amount of debris and residue tracked on the street.
- 8-16. DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding mining operations on its site, including but not limited to blasting and reclamation, as set forth in 38 M.R.S.A. §§490-W to 490EE, attached hereto and incorporated herein, except, where municipal standards adopted by the CITY are more restrictive, the CITY standards shall apply.
17. Reclamation shall be completed substantially in accordance with the plan as indicated on Attachment 3; provided, however, that such plan shall be subject to full review and approval by the Planning Board.
- 9-18. DRAGON shall meet all standards contained in sections 14-265, 14-266, and 14-267 of the Portland City Code, except as follows:
- a. No new fence shall be required pursuant to 14-266(6) except as may be required by the Planning Board during final site plan review.
  - b. Outside storage of stone shall not be required to meet the standards of §14-266(10).
  - c. ~~Vibration standards in 14-267(3) shall not apply to~~



~~blasting.~~

~~d. Noise standards in §14-267(2) shall not apply to blasting.~~

~~e. The concrete plant shall be allowed to generate 78 decibels along the Ocean Avenue frontage, but shall be limited to 65 decibels of noise as measured at property lines in accordance with the procedures set forth in §14-267(2).~~

~~10.19.~~ DRAGON shall maintain <sup>do not show</sup> ownership of all property currently owned by it at this site and also the parcel owned by Dragon and located across Ocean Avenue from this site, more particularly described as Tax Map 418, Block A, Lots 5 and 12 in the records of the Assessor of the City of Portland.

~~20.~~ This contract shall automatically terminate upon the conveyance of this property by DRAGON to another owner or entity and the area shall automatically revert to R-3 or any successor zone classification.

The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with ~~and bind~~ the subject premises, shall bind DRAGON, its successors and assigns, as permitted by this Agreement, of said property or any part thereof or interest therein, and any party in possession or occupancy of said property or any part thereof, and shall inure to the benefit of and be enforceable by the CITY, by and through its duly authorized representatives.

If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of

the remaining portions hereof.

Except as expressly modified herein, the use and occupancy of the subject premises shall be governed by and comply with the provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

In the event that **DRAGON** ~~or any successor~~ fails to continue to utilize the property in accordance with this Agreement, or in the event of a breach of any condition(s) set forth in this Agreement, the Planning Board shall have the authority, after hearing, to resolve the issue resulting in the breach or the failure to operate. The resolution may include a recommendation to the City Council that the site be rezoned to R-3 or any successor zone and that this Agreement be terminated, requiring a cessation of the blasting use permitted under this terms of this Agreement. However, the termination of the contract will not require cessation of the concrete and cement processing and manufacturing uses located on the site prior to the date of execution of this contract.

*delete*



WITNESS:

CITY OF PORTLAND

\_\_\_\_\_

By \_\_\_\_\_  
Robert B. Ganley  
Its City Manager

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 1999

Personally appeared the above-named Robert B. Ganley, in his capacity as City Manager, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the City of Portland.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

WITNESS:

DRAGON PRODUCTS, INC.

\_\_\_\_\_

By: \_\_\_\_\_  
Its \_\_\_\_\_

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 1999

Personally appeared the above-named \_\_\_\_\_, in his/her said capacity and acknowledged the foregoing instrument to be his/her free act and deed and the free act and deed of Dragon Products, Inc.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

**VERRILL**  
**DANA** LLP  
*Attorneys at Law*

ONE PORTLAND SQUARE  
P.O. BOX 586  
PORTLAND, MAINE 04112-0586  
(207) 774-4000  
FACSIMILE (207) 774-7499

**FACSIMILE TRANSMITTAL COVER SHEET**

DATE: March 25, 1998	PAGES SENT: 5
FROM: Christopher S. Neagle, Esq.	CLIENT NO.: 27920-1849
TO: Sarah Hopkins	FAX NO.: (207) 756-8258
FIRM: Planning Office	TEL. NO.:
CITY: Portland	STATE: ME

**COMMENTS**

**ATTORNEY/CLIENT WORK PRODUCT - PRIVILEGED AND CONFIDENTIAL**

THIS COMMUNICATION IS INTENDED FOR THE USE OF THE ADDRESSEE(S) NAMED HEREIN AND MAY CONTAIN LEGALLY PRIVILEGED AND CONFIDENTIAL INFORMATION. IF YOU ARE NOT THE INTENDED RECIPIENT OF THIS FACSIMILE, YOU ARE HEREBY NOTIFIED THAT ANY DISSEMINATION, DISTRIBUTION OR COPYING OF THIS COMMUNICATION IS STRICTLY PROHIBITED. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR, PLEASE NOTIFY US BY TELEPHONE AND RETURN THE ORIGINAL COMMUNICATION TO US AT THE ADDRESS ABOVE VIA THE UNITED STATES POSTAL SERVICE. WE WILL REIMBURSE COSTS YOU INCUR IN NOTIFYING US AND RETURNING THE COMMUNICATION TO US. THANK YOU.

If you do not receive this complete transmission, please call (207) 774-4000, ext. 3119.

Original: Held on file X / Follow by Mail     / Follow by Courier



CHRISTOPHER S. NEAGLE  
PARTNER  
e-mail: csn@verdan.com

ONE PORTLAND SQUARE  
PORTLAND, MAINE 04112-0586  
207-774-4000 • FAX 207-774-7499

fax: 756-8258

March 25, 1998

Sarah Hopkins  
Planning Office, Fourth Floor  
Portland City Hall  
389 Congress Street  
Portland, ME 04101

Re: Proposed Dragon Industrial Zone

Dear Sarah:

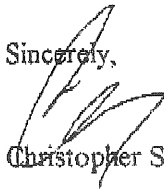
I have enclosed a marked up copy of the first three pages of proposed Contract drafted by Natalie Burns with our comments.

The relocation of the conveyor belts turns out to be a much bigger project than originally anticipated, so Dragon would like 5 years to make that change. We do not feel that Dragon should commit to a specific traffic direction, unless this issue is raised by the neighbors or the Planning Board. If you want to incorporate certain specific sections from the Maine DEP quarry standards, you can simply add the appropriate section numbers. Finally, the exceptions added to section 10 are consistent with our application. A new fence will not add any visual screening given the topography of the site.

Please have Natalie redraft the Contract this week, so we can agree on its text before next Tuesday, March 31st, when we will be submitting a revised site plan and the other material we have discussed.

Call me if you have any questions or comments.

Sincerely,



Christopher S. Neagle

CSN/csn  
Enclosure

cc: David S. Grinnell, Dragon Products Company

P:\CSN\DRAGON\HOPKINS.LTR

Post-It® Fax Note	7671	Date	3/2/98	Page	5
To	Chris Neagle	From	Natalie Burne		
Co./Dept	Hessell + Dana	City of Portland			
Phone #		Phone #	874-8480		
Fax #	774-7499	Fax #			

OCEANAV.REZ.COM  
02.19.98

3/2/98

NOT YET  
REVIEWED  
BY STAFF

AGREEMENT BETWEEN

CITY OF PORTLAND

AND

DRAGON PRODUCTS, INC.

AGREEMENT made this day of , 1998 by and between the CITY OF PORTLAND, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "CITY") and DRAGON PRODUCTS, INC., a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 (hereinafter "DRAGON").

W I T N E S S E T H:

WHEREAS, DRAGON did request a rezoning of property located at Ocean Avenue, in Portland, in order to permit the expansion of its existing legally nonconforming mining operation and on the site of its legally nonconforming cement plant; and

WHEREAS, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the property as aforesaid, subject, however, to certain conditions; and

WHEREAS, the CITY by and through its City Council has determined that said rezoning would be pursuant to and consistent with the CITY'S comprehensive land use plan and consistent with the existing and permitted uses within the original zone; and

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02.19.98

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose by agreement the following conditions or restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the CITY authorized the execution of this Agreement on \_\_\_\_\_, 1998;

NOW, THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The CITY shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by adopting the map change amendment shown on Attachment 1.
2. The property shall be developed substantially in accordance with the site plan and elevations shown on Attachment 2; provided, however, that such plan and elevations shall be subject to full site plan review by the Planning Board. *if required by City Ordinances.*
3. DRAGON shall be authorized to establish and maintain only those uses or any combination of the uses listed below:
  - a. ~~Mining operations~~, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth herein and established by State and Federal law.
  - b. ~~Concrete~~ concrete manufacture and processing.
  - c. Storage of materials utilized in the manufacturing allowed on the site, material manufactured on the site and related machinery and equipment, provided that such storage is limited to the areas shown on Attachment 2. Rock storage shall be relocated from

*(What is this?)*

*Dragon site plan?*

*mining of stone for use in manufacture of concrete on the site*

Do noise standards in §267(2) shall not apply to blasting.  
e. The concrete plant shall be allowed to generate upto 70 decibels along Ocean Avenue. Otherwise, only 65 decibels of noise shall be allowed at property lines.

d. The Buffer strip shall remain in its existing natural condition.

OCEANAV.REZ.CON  
02.19.98

its current site to the areas shown on Attachment 2.

- 4. DRAGON shall relocate the rock crusher from its current location to the rear of the site, as indicated on Attachment 2.
- 5. DRAGON shall relocate the conveyor belt to the concrete plant to the rear of the site, as indicated on Attachment 2, within 5 years of this Agreement.
- 6. DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. All blasting on the site shall occur between the hours of 7:00 a.m. and 4:00 p.m. ~~and~~ between ~~March~~ and November.
- 7. DRAGON shall ~~wash down~~ hose down the site to reduce the amount of debris and residue tracked on the street.
- 8. DRAGON shall route all trucks exiting the site and traveling inbound to Portland to Presumpscot Street, unless such trucks are making deliveries to sites located between this site and Washington Avenue, or unless Presumpscot Street is unavailable for truck traffic due to road maintenance or construction.
- 9. DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding operations on its site, including but not limited to blasting, as set forth in 38 M.R.S.A. §§490-W to 490EE. <sup>mining</sup>
- 10. DRAGON shall meet all standards contained in sections 14-265, 14-266, and 14-267, unless such standards are explicitly amended herein.
- 11. DRAGON shall maintain ownership of all property currently owned by it at this site and also the parcel owned by Dragon and located across Ocean Avenue from this site. (Map 418, Block A, Lots 5 + 12)

The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with the subject premises, shall bind DRAGON, its successors and assigns, as permitted by this Agreement, of said property or any part thereof or interest therein, and any party in possession or occupancy of

- except as follows: a. No new fence shall be required pursuant to §266(6).
- b. Outside storage of stone shall not be required to meet the standards of §266(10).

c. Vibration standards in §267(3) shall not apply to blasting

(do you want to add specifics from noise restrictions blasting + reclamation?)  
this could mean we have to enforce, but probably should we add specifics  
probably discretionary

delete

AGREEMENT BETWEEN  
CITY OF PORTLAND  
AND  
DRAGON PRODUCTS, INC.

AGREEMENT made this \_\_\_\_ day of \_\_\_\_\_, 2000 by and between the CITY OF PORTLAND, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "CITY") and DRAGON PRODUCTS COMPANY, INC., a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 (hereinafter "DRAGON").

WITNESSETH:

WHEREAS, DRAGON did request a rezoning of property located at Ocean Avenue, in Portland, in order to permit the expansion of its existing legally nonconforming mining operation and on the site of its legally nonconforming concrete plant; and

WHEREAS, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the property as aforesaid, subject, however, to certain conditions; and

WHEREAS, the CITY by and through its City Council has determined that said rezoning would be pursuant to and consistent with the CITY'S comprehensive land use plan and consistent with the existing and permitted uses within the original zone; and

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose by agreement the following conditions or

restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the CITY authorized the execution of this Agreement on \_\_\_\_\_,  
2000;

NOW, THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The CITY shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by adopting the map change amendment shown on Attachment 1. (Is this a plan the City will produce?)
2. The property may be developed substantially in accordance with the site plans and elevations shown on Attachment 2; including relocating the concrete plant, storage silos, and rock crusher, provided, however, that such plan development shall be subject to full site plan review and approval by the Planning Board.
3. DRAGON shall be authorized to establish and maintain only those uses or any combination of the uses listed below:
  - a. Mining and crushing of stone for use in manufacture of concrete on the site, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth herein and established by State and Federal law.
  - b. Concrete manufacture and processing.
  - c. Outdoor storage of materials utilized in the concrete manufacturing, material manufactured on the site (including concrete blocks produced as an incidental part of its operations) and related machinery and equipment, provided that such storage is limited to the areas shown on Attachment 2. Rock storage shall be relocated from its current site to the areas shown on Attachment 2.
4. Prior to the commencement of any mining, Dragon shall obtain from the City a Certificate of Occupancy, verifying that the site alterations of the project as approved by the Planning Board, including the relocation of the concrete plant and the removal from the site of old, unused equipment and buildings, have been completed in accordance with this Agreement.



5. If the Certificate of occupancy is not issued within five (5) years of the date of final site plan approval by the Planning Board, this rezoning agreement shall automatically terminate and the land shall automatically revert to the R-3 or any successor zone classification.
6. DRAGON shall construct a vegetated berm and fencing along that portion of the property abutting Ocean Avenue, as indicated on Attachment 2.
7. The natural vegetation existing in the Permanent Buffer Zone along the proposed quarry expansion shall remain in its natural state, as indicated on Attachment 2. This area, or any portion of it, may not be separately conveyed apart from the property as a whole.
8. DRAGON shall relocate the entrance driveway to the premises, and shall create a slip lane for slowmoving traffic along ocean Avenue as indicated on Attachment 2.
9. DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. In no event shall more than four (4) individual blasts per month be permitted. All blasting on the site shall occur on Monday through Saturday between the hours of 7:00 a.m. and 4:00 p.m. and between the months of March and November.
10. DRAGON shall hose down its trucks before exiting the site to reduce the amount of debris and residue tracked on the street.
11. DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding mining operations on its site, including but not limited to blasting and reclamation, as set forth in 38 M.R.S.A. §§490-W to 490EE, attached hereto and incorporated herein, except, where municipal standards adopted by the CITY are more restrictive, the CITY standards shall apply.
12. Reclamation shall be completed substantially in accordance with the reclamation plan, Attachment 3; provided, however, that such plan shall be subject to full review and approval by the Planning Board, if required by City ordinances.
13. DRAGON shall meet all standards contained in sections 14-265, 14-266, and 14-267 of the Portland City Code, except as follows:
  - a. No new fence shall be required pursuant to 14-266(6) except as shown on Attachment 2 as may be required by the Planning Board during final site plan review.
  - b. Outside storage of stone shall not be required to meet the standards of §14-266(10).

- c. Vibration standards in 14-267(3) shall not apply to blasting.
  - d. Noise standards in §14-267(2) shall not apply to blasting.
  - e. The existing concrete plant shall be allowed to generate 78 decibels along the Ocean Avenue frontage until it is relocated, but shall be limited to 65 decibels of noise as measured at property lines in accordance with the procedures set forth in §14-267(2).
14. Until it has relocated the concrete plant, DRAGON shall maintain ownership of all property currently owned by it at this site and also the parcels owned by Dragon and located across Ocean Avenue from this site, more particularly described as Tax Map 418, Block A, Lots 5 and 12 in the records of the Assessor of the City of Portland.

The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with and bind the subject premises, shall bind DRAGON, its successors and assigns, as owner of said property or any part thereof or interest therein, and any party in possession or occupancy of said property or any part thereof, and shall inure to the benefit of and be enforceable by the CITY, by and through its duly authorized representatives.

If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of the remaining portions hereof.

Except as expressly modified herein, the use and occupancy of the subject premises shall be governed by and comply with the provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

In the event that the CITY claims that DRAGON or any successor has failed to utilize the property in accordance with this Agreement, or otherwise breached any conditions set forth in this Agreement, the Planning Board shall have the authority, after giving DRAGON a hearing and opportunity to be heard, to determine whether any breach has occurred. Appeals of the Planning

Board decision shall be resolved by binding arbitration. If DRAGON does not correct any breach of this Agreement within 30 days of the arbitration decision, then the Planning Board may make a recommendation to the City Council that the site be rezoned to R-3 or any successor zone and that this Agreement be terminated, requiring a cessation of the blasting use permitted under this terms of this Agreement. However, the termination of the contract will not require cessation of the concrete manufacturing and processing uses located on the site prior to the date of execution of this contract, or as relocated pursuant to this Agreement.

WITNESS:

CITY OF PORTLAND

\_\_\_\_\_

By: \_\_\_\_\_  
Robert B. Ganley  
Its City Manager

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 2000

Personally appeared the above-named Robert B. Ganley, in his capacity as City Manager, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the City of Portland.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

WITNESS:

DRAGON PRODUCTS COMPANY, INC.

\_\_\_\_\_

By: \_\_\_\_\_  
Its \_\_\_\_\_

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 2000

Personally appeared the above-named \_\_\_\_\_, in his/her  
said capacity and acknowledged the foregoing instrument to be his/her free act and deed and the  
free act and deed of Dragon Products, Inc.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

Draft: March 30, 2000  
P:\CSNDRAGON\Portland.agr2.wpd

c'd: Sarah H.

# City of Portland, Maine



City Hall  
389 Congress Street  
Portland, Maine 04101

FACSIMILE MESSAGE COVER SHEET  
RETURN FAX NUMBER  
(207) 874-8497

DATE: 7/24/00

This facsimile transmission is confidential, and may be privileged and is intended for the use of the addressee only. If you are not the addressee (or a person responsible for delivering this transmission to the addressee), DO NOT use this transmission in any way, but promptly contact the sender by telephone. Thank You.

MESSAGE to the attention of: Chris Neagle

Company/Entity: Versell Dana

Message From: P. Little

Department: Corporation Counsel

Phone # (207) 874-8480

Receiving FAX number: 774-7499

Total # of Pages including cover sheet: 9

MESSAGE: Chris - Proposed changes. Please  
review + call.

## DRAGON PRODUCTS COMPANY, INC. AGREEMENT

This document is an Agreement made by **DRAGON PRODUCTS COMPANY, INC.**, a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 ("DRAGON").

WHEREAS, DRAGON requested a rezoning of its property located at Ocean Avenue, in the **City of Portland**, a Maine municipality located in Cumberland County and State of Maine ("CITY" or "Portland") in order to permit ~~the expansion of its existing legally nonconforming~~ mining operation<sup>s</sup> on the site of its ~~legally nonconforming~~ concrete plant; and

<sup>A</sup>  
existing

WHEREAS, DRAGON'S property is shown on Portland Assessor's Parcels: Map 416-A, Block A, Lot 2; Map 417, Block A, Lots 4, 5, 10 and 11; and Map 418, Block A, Lots 1, 3, 4, 5, 6, 9 and 10 ("Property"); and

WHEREAS, the Portland Planning Board, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberations, recommended the rezoning of the Property, subject, however, to certain conditions; and

WHEREAS, the CITY, by and through its City Council, has determined that the rezoning would be pursuant to and consistent with the CITY'S comprehensive land use plan and consistent with the existing and permitted uses within the original R-3 zone; and

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose the following conditions or restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the following plans and documents are attached to this Agreement and incorporated into this Agreement by reference:

- Attachment 1: City Zoning Map change (to be prepared by City)
- Attachment 2: Quarry Plan View (F-1) dated June 5, 2000
- Attachment 3: Plan View of Proposed Berm (F-2) dated June 5, 2000
- Attachment 4: Ocean Avenue Longitudal and Cross Sections (F-3) dated June 5, 2000
- Attachment 5: Reclamation Standards for Portland Quarry
- Attachment 6: Maine DEP Performance Standards for Quarries (20 pages)
- Attachment 7: Blasting Plan (5 pages)
- Attachment 8: Protocol for Complaints and Resolutions

NOW, THEREFORE, in consideration of the zone change made by the CITY, DRAGON hereby agrees as follows:

1. Site Development: The Property shall be developed substantially in accordance with the site plans and elevations shown on Attachments 2-4. DRAGON shall:

a. Remove the existing batch plant and silos, truck fuel depot, conveyor, concrete retaining wall and temporary ditch, and rock crushing facility.

b. Relocate its batch plant and related operations no closer than 350 feet to Ocean Avenue, in the "approximate limit of operation area" shown on Attachment 2.

c. Locate the new rock crusher facility no closer than 750 feet to Ocean Avenue <sup>in</sup> ~~than~~ the operations area shown on Attachment 2, and enclose any rock crushing operations within an insulated building.

d. A new earthen berm, fence, paved entrance, drainage ditch, and climbing lane will be <sup>constructed</sup> ~~developed~~ along the west side of Ocean Avenue as shown on Attachments 2-4. The final berm design, landscape planting and schedule will be determined by the Planning Board in its site plan review, after consultation with the City Arborist.

e. DRAGON shall relocate the entrance driveway to the premises, and shall create a slip lane for slow-moving traffic along Ocean Avenue as shown on Attachments 2 and 3. To the extent that any of the new roadway or drainage improvements are located on land of DRAGON, it will deed that portion of its land to the CITY.

f. Develop a stormwater management plan for the entire site, including all improvements along Ocean Avenue and within the operations area according to MeDEP performance standards.

Provided, however, that such development shall be subject to full Site Plan review and approval by the Planning Board, which may approve modifications to these plans as part of the review process.

2. Authorized Uses: DRAGON shall only be authorized to establish and maintain the following uses or any combination of the uses on the Property, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth in this Agreement and established by State and Federal law:

a. Mining of stone in the "quarry expansion area", including blasting, and crushing of stone for use in manufacture of concrete on the site.

b. Concrete manufacture and processing.

c. Outdoor storage of materials, including rock piles utilized in the concrete manufacturing, material manufactured on the site, including concrete blocks produced as an incidental part of its operations, and related machinery and equipment.

e. All concrete trucks shall be hosed down before exiting the operations area on the Property to reduce the amount of debris and residue tracked onto Ocean Avenue.

f. Vehicle repair and storage and office operations within the existing Dragon Products Company garage facilities (3 bays) shown on Attachment 2.



3. Timing of Uses on Property: Prior to the commencement of any blasting, mining or rock crushing, Dragon shall obtain from the City a Certificate of Occupancy, verifying that all site alterations described in Section 1 and as otherwise approved by the Planning Board have been completed. DRAGON shall discontinue use of its existing batch plant within 30 days of its new batch plant being fully operational, and shall remove its existing batch plant from the Property within 180 days of its use being discontinued.

4. Time Limit for Certain Site Improvements: Dragon shall apply for Site Plan Approval for the site changes described in Section 1 (a, c-f) (all site improvements except the rock crusher) within one year of the ~~final approval of this Agreement~~ <sup>rezoning of the Property</sup> by the City Council, and shall complete all approved site improvements within two years of final Planning Board approval of the site plan, or this contract shall automatically terminate and the Property shall automatically revert to the R-3 or any successor zone classification.

5. Natural Buffer Areas: The existing trees and other natural vegetation in the "existing wooded buffer strip" on the south side of the site <sup>and</sup> the "existing vegetation" on the north side of the site shown on Attachment 2 shall remain in their natural state. These areas, or any portions of them, may not be separately conveyed apart from the Property as a whole, while any blasting, mining, concrete manufacturing, or other uses not consistent with the underlying R-3 or successor zone are being conducted on the Property.

6. Limits on Blasting: DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. In no event shall more than four (4) individual blasts per month be permitted. All blasting and rock crushing on the site shall occur on Monday through Friday between the hours of 9:00 a.m. and 4:00 p.m. and between the months of March and November.

7. Blasting Operations: DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding mining operations on its site, including those set forth in 38 M.R.S.A. §§490-W to 490EE (Attachment 6) as it may be amended, except where municipal standards adopted by the CITY which are not otherwise described in this Agreement

are more restrictive, the CITY standards shall apply. The MeDEP standards shall include, but not be limited to:

- a. Blasting standards described in §490-Z (14), including preblast surveys as described in subsection (F), sound standards described in subsection (H), vibration standards described in subsections (I) - (K), and blasting records as described in subsection (L), including records of peak particle velocity and decibels for each blast.
- b. Dust standards described §490-Z (12)
- c. Reclamation standards described in §490-Z (13)

All blasting shall also be conducted in accordance with the Blasting Plan, Pre-blast Inspection Procedures, Drilling and Blasting Procedures Blasting Records standards shown on Attachment 7.

8. Complaint Protocol: DRAGON shall maintain the complaint resolution protocol and City reporting protocol described in Attachment 8. Furthermore, in the event of prolonged and chronic complaints by area residents of substantial noncompliance with the terms of this Agreement by DRAGON, then the CITY may ask the MeDEP to review DRAGON's blasting operations for compliance with this Agreement. If DRAGON fails to implement any changes recommended by the MeDEP within a reasonable time period, then: (a) the CITY may hire third-party blasting engineers to conduct a 'peer review' of DRAGON's blasting operations and compliance with this Agreement, and the CITY's reasonable costs for such engineers shall be reimbursed by DRAGON; and/or (b) the CITY may seek to enforce this Agreement pursuant to Section 17.

9. Reclamation of Site: Reclamation of the Property into a vegetated, useable condition shall be completed substantially in accordance with the reclamation plan described in Attachment 5 within 2 years of completion of the mining on the Property; provided, however, that such plan shall be subject to full review and approval by the Planning Board before being implemented.

10. City Zoning Standards: DRAGON shall meet all IL zoning standards contained in sections 14-234, 14-235, and 14-236 of the Portland City Code, except as follows:

- a. No new fence shall be required pursuant to 14-235(6) except as shown on Attachments 2-4 and as may be required by the Planning Board during final site plan review.
- b. Outside storage of sand and stone shall not be required to meet the standards of §14-235(10).
- c. Vibration standards in §14-236(3) shall not apply to blasting, and IM vibration standards found in §14-252(3) shall apply to all other operations.
- d. Noise standards in §14-236(1) shall not apply to blasting.
- e. The existing concrete batch plant shall be allowed to generate 78 decibels along the Ocean Avenue frontage until it is removed from the Property, but the new concrete production building shall comply with §14-236(1) when measured at property lines of the Property.

11. IL Zoning Standards: Except as expressly modified in this Agreement, the use and occupancy of the Property shall be governed by and comply with the IL zoning provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

12. Parcels east of Ocean Avenue: As long as it operates its existing concrete batch plant, DRAGON shall maintain ownership of the parcels east of Ocean Avenue across from the Property, more particularly described as Tax Map 418-A, Block A, Lots 5 and 12 in the records of the Assessor of the City of Portland.

13. DRAGON's Successors: If DRAGON sells or transfers the Property to any new owner in the future which wants to continue the blasting, mining and concrete manufacturing operations, then any prospective new owner must receive written approval from the City of Portland Planning Department as to that owner's technical and financial abilities to comply with the terms of this contract, and the new owner must sign a copy of this Agreement agreeing to comply with all of its terms. *The legal instrument conveying the property shall specifically refer to this Agreement*

14. Record Notice: DRAGON agrees to record this Agreement in the Cumberland County Registry of Deeds, and to include a reference to it in any deed conveying any of the Property.

15. Enforceability: The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with and bind the subject premises, shall bind DRAGON, its successors and assigns, as owner of the Property or any part thereof or interest therein, and any party in possession or occupancy of the Property or any part thereof, and shall inure to the benefit of and be enforceable by the CITY, by and through its duly authorized representatives.

16. Severability: If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of the remaining portions hereof.

17. Default by Dragon: In the event that the CITY claims that DRAGON or any successor has failed to utilize the Property in accordance with this Agreement, then it may give DRAGON written notice of the default claimed by the CITY. (Optional: The City Planning Staff may seek a hearing on these issues before the Planning Board at any time.) If DRAGON does not correct the defaults in a timely manner to the CITY's satisfaction, then the CITY may <sup>initiate</sup> a judicial enforcement action for the breach of this Agreement. If it is determined in such judicial enforcement action that DRAGON has breached this Agreement, and DRAGON fails to comply with the Agreement in a timely manner after such judicial determination, then the City Planning Staff may also recommendation to the City Council that this Agreement be terminated, requiring a cessation of the blasting and mining use permitted under this terms of this Agreement; provided

that the termination of the contract will not require cessation of the concrete manufacturing and processing uses <sup>conducted</sup> located on the site prior to the date of execution of this Agreement, or as relocated pursuant to this Agreement.

WITNESS:

DRAGON PRODUCTS COMPANY, INC.

\_\_\_\_\_

By: \_\_\_\_\_

Print Name:

\_\_\_\_\_

Its: \_\_\_\_\_

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 2000

\_\_\_\_\_, as \_\_\_\_\_ of Dragon Products Company, Inc, personally appeared before me and acknowledged that the signature on this document was his free act and deed acting on behalf of Dragon Products Company, Inc.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

Print Name:

\_\_\_\_\_

Draft: July 6, 2000  
C:\WINDOWS\TEMP\ZONING~1.WPD

18. This contract shall be executed simultaneously with Portland City Council approval of the Rezoning of the Property.

*Do we want to terminate sales to this land? Do we want this to stay with the land? Do we apply only to this agreement?*

**AGREEMENT BETWEEN  
CITY OF PORTLAND  
AND  
DRAGON PRODUCTS, INC.**

**AGREEMENT** made this      day of      , 1999 by and between the **CITY OF PORTLAND**, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "**CITY**") and **DRAGON PRODUCTS, INC.**, a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 (hereinafter "**DRAGON**").

**W I T N E S S E T H:**

**WHEREAS**, **DRAGON** did request a rezoning of property located at Ocean Avenue, in Portland, in order to permit the expansion of its existing legally nonconforming mining operation and on the site of its legally nonconforming ~~cement~~concrete plant; and

**WHEREAS**, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the property as aforesaid, subject, however, to certain conditions; and

**WHEREAS**, the **CITY** by and through its City Council has determined that said rezoning would be pursuant to and consistent with the **CITY'S** comprehensive land use plan and consistent with the existing and permitted uses within the original zone; and

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose by agreement the following conditions or restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the CITY authorized the execution of this Agreement on \_\_\_\_\_, 1999;

NOW, THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The CITY shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by adopting the map change amendment shown on Attachment 1.
2. The property shall be developed substantially in accordance with the site plan and elevations shown on Attachment 2; provided, however, that such plan and elevations shall be subject to full site plan review and approval by the Planning Board, ~~if required by City ordinances.~~
3. ~~Prior to the commencement of any mining, Dragon shall obtain from the City a Certificate of Occupancy, verifying, at minimum, that the site alterations of Phase I of the project have been completed to the satisfaction of the City. Phase I of the project is considered includes, at minimum, to include actions all activities identified in Paragraphs 5, 6, 7, 8, 9, 11, 12 of this Agreement. If the Certificate of Occupancy is not issued within \_\_\_ years of the date of final site plan approval by the Planning Board, this rezoning agreement shall automatically terminate.~~
- 3-4. DRAGON shall be authorized to establish and maintain only those uses or any combination of the uses listed below:

- a. Mining of stone for use in manufacture of concrete on the site, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth herein and established by State and Federal law.
  - b. Concrete manufacture and processing.
  - c. Storage of materials utilized in the manufacturing allowed on the site, material manufactured on the site and related machinery and equipment, provided that such storage is limited to the areas shown on Attachment 2. Rock storage shall be relocated from its current site to the areas shown on Attachment 2.
  - d. ~~The buffer strip shown on Attachment 2 shall remain in its existing natural condition.~~
- ~~4-5.~~ DRAGON shall relocate the rock crusher from its current location to the rear of the site, as indicated on Attachment 2.
- ~~6.~~ DRAGON shall construct <sup>to be</sup> a densely vegetated berm along that portion of the property abutting Ocean Avenue.
- ~~7.~~ DRAGON shall relocate the entrance/ingress/egress driveway to the premises, as indicated ~~depicted~~ on Attachment 2.
- ~~5-8.~~ DRAGON shall relocate the concrete batch plant and the conveyor belt to the concrete batch plant to the rear of the site, as indicated on Attachment 2, ~~within five years of the date of this Agreement.~~
- ~~9.~~ DRAGON shall relocate the silos to the rear of the site, as indicated on Attachment 2, ~~within five years of the date of this Agreement.~~
- ~~11-10.~~ The natural vegetation existing along the perimeter of the property as depicted on Attachment 2 shall remain in its natural state to a depth of no less than \_\_\_\_\_ feet. This area, or any portion of it, may not be separately conveyed apart from the property as a whole.
- ~~12-11.~~ A \_\_\_\_\_ foot deep roadside vegetative buffer strip along Ocean Avenue as shown on Attachment 2 shall be created and maintained by Dragon.



~~6.10-12.~~ DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. In no event shall more than three (3) individual blasts per month be permitted. All blasting on the site shall occur on Monday through Saturday between the hours of 7:00 a.m. and 4:00 p.m. and between the months of March and November.

~~7.13.~~ DRAGON shall hose down trucks on the site to reduce the amount of debris and residue tracked on the street.

~~8.14.~~ DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding mining operations on its site, including but not limited to blasting and reclamation, as set forth in 38 M.R.S.A. §§490-W to 490EE except, where municipal standards adopted by the CITY are more restrictive the CITY standards shall apply.

~~9.15.~~ DRAGON shall meet all standards contained in sections 14-265, 14-266, and 14-267, except as follows:

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- a. No new fence shall be required pursuant to 14-266(6) *except as may be required by the Planning Board during final site plan review.*
- b. Outside storage of stone shall not be required to meet the standards of §14-266(10)
- ~~c. Vibration standards in 14-267(3) shall not apply to blasting.~~
- ~~d. Noise standards in §14-267(2) shall not apply to blasting.~~
- ~~e. The concrete plant shall be allowed to generate 78 decibels along the Ocean Avenue frontage, but shall be limited to 65 decibels of noise as measured at property lines in accordance with the procedures set forth in §14-267(2).~~

~~10.16.~~ DRAGON shall maintain, in single ownership, of all property currently owned by it at this site and also the parcel owned by Dragon and located across Ocean Avenue from this site, more particularly described as Tax Map 418, Block A, Lots 5 and 12 in the records of the Assessor of the City of Portland.

The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with the subject premises, shall bind DRAGON, its successors and assigns, as permitted by this Agreement, of said property or any part thereof or interest therein, and any party in possession or occupancy of said property or any part thereof, and shall inure to the benefit of and be enforceable by the CITY, by and through its duly authorized representatives.

If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of the remaining portions hereof.

Except as expressly modified herein, the use and occupancy of the subject premises shall be governed by and comply with the provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

In the event that DRAGON or any successor fails to continue to utilize the property in accordance with this Agreement, or in the event of a breach of any condition(s) set forth in this Agreement, the Planning Board shall have the authority, after hearing, to resolve the issue resulting in the breach or the failure to operate. The resolution may include a recommendation to the City

Council that the site be rezoned to R-3 or any successor zone and that this Agreement be terminated, requiring a cessation of the blasting use permitted under this terms of this Agreement. However, the termination of the contract will not require cessation of the concrete and cement processing and manufacturing uses located on the site prior to the date of execution of this contract.

WITNESS:

\_\_\_\_\_

CITY OF PORTLAND

By \_\_\_\_\_  
Robert B. Ganley  
Its City Manager

WITNESS:

\_\_\_\_\_

DRAGON PRODUCTS, INC.

By: \_\_\_\_\_  
  
Its \_\_\_\_\_

STATE OF MAINE  
CUMBERLAND, ss.

, 1999

Personally appeared the above-named Robert B. Ganley, in his capacity as City Manager, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the City of Portland.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

STATE OF MAINE  
CUMBERLAND, ss.

, 1999

Personally appeared the above-named \_\_\_\_\_, in his/her said

DRAGON.REZ.CON.PL  
01.14.99

capacity and acknowledged the foregoing instrument to be his/her free act and deed and the free act and deed of Dragon Products, Inc.

Before me,

Notary Public/Attorney at Law

OCEANAV.REZ.CON  
02.26.98

AGREEMENT BETWEEN  
CITY OF PORTLAND  
AND  
DRAGON PRODUCTS, INC.

AGREEMENT made this      day of      , 1998 by and between the CITY OF PORTLAND, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "CITY") and DRAGON PRODUCTS, INC., a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 (hereinafter "DRAGON").

W I T N E S S E T H:

WHEREAS, DRAGON did request a rezoning of property located at Ocean Avenue, in Portland, in order to permit the expansion of its existing legally nonconforming mining operation and on the site of its legally nonconforming <sup>concrete</sup> cement plant; and

WHEREAS, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the property as aforesaid, subject, however, to certain conditions; and

WHEREAS, the CITY by and through its City Council has determined that said rezoning would be pursuant to and consistent with the CITY'S comprehensive land use plan and consistent with the existing and permitted uses within the original zone; and

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose by agreement the following conditions or restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the CITY authorized the execution of this Agreement on \_\_\_\_\_, 1998;

NOW, THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The CITY shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by adopting the map change amendment shown on Attachment 1.
2. The property shall be developed substantially in accordance with the site plan and elevations shown on Attachment 2; provided, however, that such plan and elevations shall be subject to full site plan review by the Planning Board, ~~if required by City ordinances.~~
3. DRAGON shall be authorized to establish and maintain only those uses or any combination of the uses listed below:
  - a. Mining of stone for use in manufacture of concrete on the site, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth herein and established by State and Federal law.
  - b. Concrete manufacture and processing.
  - c. Storage of materials utilized in the manufacturing allowed on the site, material manufactured on the site and related machinery and equipment, provided that such storage is limited to the areas shown on

*5 years  
for Dragon to  
make changes  
before they can  
mine.*

*If no other  
before 5 yrs,  
contract zone  
will expire  
1/6/98.*

Attachment 2. Rock storage shall be relocated from its current site to the areas shown on Attachment 2.

- d. The buffer strip shown on Attachment 2 shall remain in its existing natural condition.
4. DRAGON shall relocate the rock crusher from its current location to the rear of the site, as indicated on Attachment 2.
5. DRAGON shall relocate the conveyor belt to the concrete plant to the rear of the site, as indicated on Attachment 2, within five years of the date of this Agreement. *site plan*
6. DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. All blasting on the site shall occur between the hours of 7:00 a.m. and 4:00 p.m. and between the months of March and November.
7. DRAGON shall hose down trucks on the site to reduce the amount of debris and residue tracked on the street.
8. DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding mining operations on its site, including but not limited to blasting, as set forth in 38 M.R.S.A. §§490-W to 490EE.
9. DRAGON shall meet all standards contained in sections 14-265, 14-266, and 14-267, except as follows: *✓*
- a. *existing fence insufficient*  
No new fence shall be required pursuant to 14-266(6).
  - b. Outside storage of stone shall not be required to meet the standards of §14-266(10)
  - c. Vibration standards in 14-267(3) shall not apply to blasting.
  - d. Noise standards in §14-267(2) shall *amended stds.* not apply to blasting. *Shall meet 14-267 standards at PL.*
  - e. *at plant*  
The concrete plant shall be allowed to generate 78 decibels along the Ocean Avenue frontage, but shall be limited to 65 decibels of noise as measured at property lines ~~in accordance with the procedures~~

*Attach DEP  
Stand as  
an EXHIBIT.*

*except as required by 3 PB during JP review*



*buffer area  
can not in  
zone*  
Its successors or assigns  
set forth in §14-267(2).

*w/ full disclosure.*

*Dragon  
must maintain  
all property on  
side of Ocean.*

10. DRAGON shall maintain ownership of all property currently owned by it at this site, and also the parcel owned by Dragon and located <sup>on west side of</sup> across Ocean Avenue, from this site, more particularly described as Tax Map 418, Block A, Lots 5 and 12 in the records of the Assessor of the City of Portland.

*Any new owner/operator. \$) sign  
Contract.*

The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with the subject premises, shall bind DRAGON, its successors and assigns, as permitted by this Agreement, of said property or any part thereof or interest therein, and any party in possession or occupancy of said property or any part thereof, and shall inure to the benefit of and be enforceable by the CITY, by and through its duly authorized representatives.

*Property make  
release.*

If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of the remaining portions hereof.

Except as expressly modified herein, the use and occupancy of the subject premises shall be governed by and comply with the provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

In the event that DRAGON or any successor fails to continue to utilize the property in accordance with this Agreement, or in the



event of a breach of any condition(s) set forth in this Agreement, the Planning Board shall have the authority, after hearing, to resolve the issue resulting in the breach or the failure to operate. The resolution may include a recommendation to the City Council that the site be rezoned to R-3 or any successor zone and that this Agreement be terminated, requiring a cessation of the blasting use permitted under this terms of this Agreement. However, the termination of the contract will not require cessation of the concrete and cement processing and manufacturing uses located on the site prior to the date of execution of this contract.

WITNESS:

\_\_\_\_\_

CITY OF PORTLAND

By \_\_\_\_\_  
Robert B. Ganley  
Its City Manager

WITNESS:

\_\_\_\_\_

DRAGON PRODUCTS, INC.

By: \_\_\_\_\_

Its \_\_\_\_\_

STATE OF MAINE  
CUMBERLAND, ss.

, 1998

Personally appeared the above-named Robert B. Ganley, in his capacity as City Manager, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the City of Portland.

Before me,

OCEANAV.REZ.CON  
02.26.98

\_\_\_\_\_  
Notary Public/Attorney at Law

STATE OF MAINE  
CUMBERLAND, ss.

, 1998

Personally appeared the above-named \_\_\_\_\_, in his/her said capacity and acknowledged the foregoing instrument to be his/her free act and deed and the free act and deed of Dragon Products, Inc.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

**CITY OF PORTLAND, MAINE  
DEPARTMENT OF PUBLIC WORKS  
OPERATIONS/ENGINEERING - INSPECTIONS  
M E M O R A N D U M**

**TO:** Alex Jaegerman, Senior Planner  
Cheryl Leeman, Councilor District 4  
**CC:** Katherine Staples, Rick Meserve  
**FROM:** Bradley A. Roland, Project Engineer *BAR*  
**DATE:** July 14, 1998  
**SUBJECT:** Dragon Products - Stormwater Management

---

I was made aware of Dragon Products current application for expansion of their Ocean Avenue plant through a recent newspaper article. I thought I would forward the enclosed letter to highlight issues that Rick Meserve and myself have been trying to get Dragon Products to address.

Rick and I have meet twice with Mark West, a representative from Dragon. Mr. David Grinnell had scheduled both appointments but did not attend either. As the letter indicates, stormwater from the plant is creating problems for sediment accumulation and erosion along Ocean Avenue. The previous owners, Cook & Company, maintained the drainage ditch to prevent these problems. We are asking Dragon to do the same as their stormwater is the major, if not only, cause of the problem.

If the City is considering Dragon Products permit application, I hope that someone will contact Rick or myself to discuss the issues and possible view the areas in questions. Any permit granted by the City should address the issue of offsite discharge of their stormwater. Dragon will be increasing their stormwater discharge because they will now need to pump their gravel pit more frequently in order to work in it.

If you have any questions, please contact me at 8840.  
Thank You



## CITY OF PORTLAND

July 13, 1998

Mr. David Grinnell  
Dragon Products Company, Inc.  
38 Preble Street  
Portland, ME 04101

Re: Storm Water Management and Erosion Control Measures

Dear Mr. Grinnell,

This letter is written in response to a request by Mr. Mark West to provide written documentation of storm water management practices and erosion control issues at the Dragon Products cement plant on Ocean Avenue. On June 22, and July 6, 1998, representatives from the City of Portland, Department of Public Works (DPW) met with Mr. West to discuss and identify areas of concern.

The DPW along with members of Dragon Products, agree that the erosion and sediment buildup in the drainage swale along Ocean Avenue is a direct result of discharges from your site. The City is requesting that appropriate corrective measures be taken to address these issues. These areas of concern include:

- Aggregate being pushed over the retaining wall into the right-of-way of Ocean Avenue.
- Sand being discharged from the site at the construction/stockpile entrance and at the batch plant entrance.
- Accumulation of sand and aggregate throughout the City's drainage swale and at the culvert under the old pit access road.
- Undermining (due to erosion) of the guard rail at pit access road.
- Undermining of the roadway in several spots along Ocean Avenue.
- Damage of the asphalt overlay on Ocean Avenue by erosion.

In our latest meeting, July 6, 1998, Mr. West indicated that they attempted to address some of the issues with a loader onsite. They were able to move the large pile of aggregate pushed over the retaining wall, however the attempt to use the loader to remove sediment from the drainage system did more damage to the asphalt of Ocean Avenue than was previously noted.

Mr. David Grinnell  
7/13/98  
Page 2

Furthermore, Mr. West asked what methods should be employed to prevent erosion of the road and address the storm water issues. We identified work done by the previous owner who installed free form concrete that acts as a barrier along the road and a channel to direct the storm water. Methods which would be appropriate to correct these issues include:

- The installation of a screen or other material along the retaining wall to prevent the spilling of aggregate into the right-of-way.
- The installation of silt fence or hay bales at the construction/stockpile and batch plant entrances to prevent the sand and aggregate from leaving the site.
- The removal of accumulated sand and aggregate throughout the City's drainage swale.
- The resetting of the guard rail in an upright position and securing it against future erosion.
- The installation of protective devices to channel storm water away from the roadway.
- Patching or overlaying portions of Ocean Avenue.

It should be noted that the previous owner of the site, Cook & Company, conducted annual maintenance along Ocean Avenue for the sediments which accumulated from the site.

One of the concerns Mr. West noted for the completion of the work was the volume and speed of traffic along Ocean Avenue. It was suggested that traffic could be diverted to Presumpscot Street for the single lane in front of the plant. Coordination of this activity should be made through the Portland Traffic Division and the Portland Police Department. The DPW does not have staff available to be used in traffic control.

Finally, Mr. West has requested that the DPW investigate the source of water which is discharging at the bottom of your retaining wall. Mr. West did not think it was coming from the site. I have been unable to find any information to the contrary, however further investigation will be completed.

I am sure that the representatives of Dragon are aware of the many State and Federal regulations provided for the management and discharge of storm waters. The review of Federal regulation 40 CFR 122.26 addresses the discharge of storm waters and specifies the permitting and erosion control requirements for said discharge. The DPW has not

Mr. David Grinnell

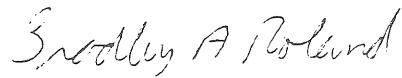
7/13/98

Page 3

taken up the issue of permitting as they feel that Dragon has been responsive to our requests and we assume that these issues will be addressed in a timely manner. If there are any questions, please contact me at 874-8846.

Sincerely,

CITY OF PORTLAND

Handwritten signature of Bradley A. Roland in cursive script.

Bradley A. Roland, P.E.

Project Engineer

bar/200-13.DOC

cc: William Bray, P.E., Director Public Works  
Bruce Bell, Operations Manager  
Katherine Staples, P.E., City Engineer  
Larry Ash, Traffic Engineer  
Rick Meserve, District 4 Supervisor

VERRILL  
&  
DANA<sup>LLP</sup>  
*Attorneys at Law*

CHRISTOPHER S. NEAGLE  
PARTNER  
e-mail: csn@verdan.com

ONE PORTLAND SQUARE  
PORTLAND, MAINE 04112-0586  
207-774-4000 • FAX 207-774-7499

May 18, 2000

Sarah Hopkins  
Planning Office  
Portland City Hall  
389 Congress Street  
Portland, ME 04101

Penny Littell  
Corporation Counsel  
Portland City Hall  
389 Congress Street  
Portland, ME 04101

Re: Proposed Dragon Industrial Zone

Dear Sarah and Penny:

Pursuant to the comments of the Planning Board and Penny at the last workshop meeting, I have enclosed a new draft of the proposed agreement between the City of Portland and Dragon Products Company, Inc. I have tried my best to incorporate all of the questions and issues that were contained in my notes, but I suspect that either or both of you may have other comments on the planning terms or legal terms of this agreement.

Dragon Products has not yet had a chance to review this text so I reserve the right to suggest other changes after it has had a chance to do so. Note that based on a discussion with the Devitos immediately after the hearing, Dragon agreed to eliminate any blasting on Saturday, limiting its blasting operations to Monday through Friday.

Thanks for all of your help on this file. Call me with any questions.

Sincerely,

  
Christopher S. Neagle

CSN/csn

Enclosure

cc: David S. Grinnell, Dragon Products Company

P:\CSN\Dragon\Hopkins - Littell letter.wpd

COPY

AGREEMENT BETWEEN  
CITY OF PORTLAND  
AND  
DRAGON PRODUCTS COMPANY, INC.

AGREEMENT made this \_\_\_\_ day of \_\_\_\_\_, 2000 by and between the CITY OF PORTLAND, a body corporate and politic, located in Cumberland County and State of Maine (hereinafter the "CITY") and DRAGON PRODUCTS COMPANY, INC., a corporation with a business address of 38 Preble Street, P.O. Box 1521, Portland, Maine 04104 (hereinafter "DRAGON").

W I T N E S S E T H:

WHEREAS, DRAGON requested a rezoning of its property located at Ocean Avenue, in Portland, in order to permit the expansion of its existing legally nonconforming mining operation on the site of its legally nonconforming concrete plant; and

WHEREAS, DRAGON'S property is shown on City of Portland Assessor's Parcels: Map 416-A, Block A, Lot 2; Map 417, Block A, Lots 4, 5, 10 and 11; and Map 418, Block A, Lots 1, 3, 4, 5, 6, 9 and 10 ("Property"); and

WHEREAS, the Planning Board of the City of Portland, pursuant to 30-A M.R.S.A. §4352(8), and after notice and hearing and due deliberation thereon, recommended the rezoning of the Property, subject, however, to certain conditions; and



WHEREAS, the CITY by and through its City Council has determined that the rezoning would be pursuant to and consistent with the CITY'S comprehensive land use plan and consistent with the existing and permitted uses within the original R-3 zone; and

WHEREAS, the CITY has determined that because of the unusual nature of the proposed development it is necessary or appropriate to impose by agreement the following conditions or restrictions in order to insure that the rezoning is consistent with the CITY's comprehensive land use plan; and

WHEREAS, the following plans and documents are attached to this Agreement:

- Attachment 1: Proposed Dragon Contract Zone Details, revised through \_\_\_\_\_, 2000.
- Attachment 2: Plan View of Proposed Berm, revised through \_\_\_\_\_, 2000.
- Attachment 3: Quarry Entrance with Berm and Merging Lane, revised through \_\_\_\_\_, 2000.
- Attachment 4: Ocean Avenue Longitudal and Cross Sections
- Attachment 5: Reclamation Standards for Portland Quarry.

WHEREAS, the CITY authorized the execution of this Agreement on \_\_\_\_\_, 2000;

NOW, THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. The CITY shall amend the Zoning Map of the City of Portland, dated March 1958, as amended and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by §14-49 of the Portland City Code, by showing that this contract zone applies to the parcels making up the Property.
2. The Property shall be developed substantially in accordance with the site plans and elevations shown on Attachment 2. DRAGON shall:
  - a. Relocate the concrete plant, storage silos and related operations away from Ocean Avenue generally as shown on Attachment 2;
  - b. Locate any rock crusher no closer to Ocean Avenue than the operations area shown on Attachment 2, and enclose any rock crushing operations with a building;

c. The existing rock crusher and wall visible from Ocean Avenue shall be removed from the Property;

d. A landscaped berm and fence will be developed on Ocean Avenue as shown on Attachments 2, 3 and 4; and

e. DRAGON shall relocate the entrance driveway to the premises, and shall create a slip lane for slow-moving traffic along Ocean Avenue as indicated on Attachments 2 and 3.

Provided, however, that such development shall be subject to full site plan review and approval by the Planning Board, which may approve modifications to these plans as part of the review process.

3. DRAGON shall only be authorized to establish and maintain the following uses or any combination of the uses on the Property:

a. Mining and crushing of stone for use in manufacture of concrete on the site, provided that such operations are limited to the areas shown on Attachment 2 and further provided that such operations meet the standards set forth in this agreement and established by State and Federal law.

b. Concrete manufacture and processing.

c. Outdoor storage of materials, including rock piles, utilized in the concrete manufacturing, material manufactured on the site (including concrete blocks produced as an incidental part of its operations) and related machinery and equipment, provided that such storage is limited to the areas shown on Attachment 2.

4. Prior to the commencement of any blasting and/or mining, Dragon shall obtain from the City a Certificate of Occupancy, verifying that the site alterations of the project as approved by the Planning Board described in Paragraph 2 have been completed in accordance with this Agreement.

5. If the Certificate of occupancy is not issued within five (5) years of the date of final site plan approval by the Planning Board, this rezoning agreement shall automatically terminate and the land shall automatically revert to the R-3 or any successor zone classification.

6. The existing trees and other natural vegetation in the Permanent Buffer Zone shown on Attachment 1 shall remain in their natural state. This area, or any portion of it, may not be separately conveyed apart from the Property as a whole, while any blasting, mining, concrete manufacturing, or other uses not consistent with the underlying R-3 zone are being conducted on the Property.

7. DRAGON shall limit the total number of blasts on the site to a maximum of twenty (20) individual blasts per year. In no event shall more than four (4) individual blasts per month be permitted. All blasting on the site shall occur on Monday through Friday between the hours of 7:00 a.m. and 4:00 p.m. and between the months of March and November.

8. DRAGON agrees to comply with all requirements of the Maine Department of Environmental Protection regarding mining operations on its site, as set forth in 38 M.R.S.A. §§490-W to 490EE, attached hereto and incorporated herein, except, where municipal standards adopted by the CITY which are not otherwise described in this Agreement are more restrictive, the CITY standards shall apply. The MeDEP standards shall include, but not be limited to:

- a. Blasting standards described in §490-Z (14), including preblast surveys as described in subsection (F), sound standards described in subsection (H), vibration standards described in subsections (I) - (K), and blasting records described in subsection (L).
- b. Dust standards described §490-Z (12)
- c. Reclamation standards described in §490-Z (13)

9. Reclamation shall be completed substantially in accordance with the reclamation plan described in Attachment 5; provided, however, that such plan shall be subject to full review and approval by the Planning Board by the Planning Board before being implemented.

10. DRAGON shall hose down its trucks before exiting the site to reduce the amount of debris and residue tracked on the street.

11. DRAGON shall meet all standards contained in sections 14-265, 14-266, and 14-267 of the Portland City Code, except as follows:

- a. No new fence shall be required pursuant to 14-266(6) except as shown on Attachments 2 and 3 and as may be required by the Planning Board during final site plan review.
- b. Outside storage of stone shall not be required to meet the standards of §14-266(10).
- c. Vibration standards in 14-267(3) shall not apply to blasting.
- d. Noise standards in §14-267(2) shall not apply to blasting.
- e. The existing concrete plant shall be allowed to generate 78 decibels along the Ocean Avenue frontage until it is relocated, but shall be limited to 65 decibels of noise as measured at property lines in accordance with the procedures set forth in §14-267(2).

12. Until it has relocated the existing concrete plant, DRAGON shall maintain ownership of the parcels owned by DRAGON east of Ocean Avenue across from the Property, more particularly described as Tax Map 418-A, Block A, Lots 5 and 12 in the records of the Assessor of the City of Portland.

13. If DRAGON sells or transfers the Property to any new owner in the future which wants to continue the blasting, mining and concrete manufacturing operations, then any prospective new owner must receive written approval from the City of Portland Planning Department as to that owners' technical and financial abilities to comply with the terms of this contract.

The above stated restrictions, provisions and conditions are an essential part of the rezoning, shall run with and bind the subject premises, shall bind DRAGON, its successors and assigns, as owner of the Property or any part thereof or interest therein, and any party in possession or occupancy of said Property or any part thereof, and shall inure to the benefit of and be enforceable by the CITY, by and through its duly authorized representatives.

If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed as a separate, distinct and independent provision and such determination shall not affect the validity of the remaining portions hereof.

Except as expressly modified herein, the use and occupancy of the subject premises shall be governed by and comply with the provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

In the event that the CITY claims that DRAGON or any successor has failed to utilize the Property in accordance with this Agreement, or otherwise breached any conditions set forth in this Agreement, the Planning Board shall have the authority, after giving DRAGON a hearing and opportunity to be heard, to determine whether any breach has occurred, before the CITY brings any judicial enforcement action for the breach of this agreement. If it is determined in such judicial enforcement action that DRAGON has breached this Agreement, and DRAGON fails to comply with the Agreement in a timely manner after such judicial determination, then the Planning Board may also make a recommendation to the City Council that this Agreement be terminated, requiring a cessation of the blasting and mining use permitted under this terms of this Agreement; provided that the termination of the contract will not require cessation of the concrete manufacturing and processing uses located on the site prior to the date of execution of this contract, or as relocated pursuant to this Agreement.

WITNESS:

CITY OF PORTLAND

\_\_\_\_\_

By: \_\_\_\_\_  
Robert B. Ganley  
Its City Manager

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 2000

Personally appeared the above-named Robert B. Ganley, in his capacity as City Manager, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of the City of Portland.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

WITNESS:

DRAGON PRODUCTS COMPANY, INC.

\_\_\_\_\_

By: \_\_\_\_\_  
Its \_\_\_\_\_

STATE OF MAINE  
CUMBERLAND, ss.

Date: \_\_\_\_\_, 2000

Personally appeared the above-named \_\_\_\_\_, in his/her said capacity and acknowledged the foregoing instrument to be his/her free act and deed and the free act and deed of Dragon Products, Inc.

Before me,

\_\_\_\_\_  
Notary Public/Attorney at Law

**SUMMARY DATA FROM 'BLAST EVENTS' OF OCTOBER 9, 2001**



**HARRY C. CROOKER & SONS, INC. - PEJEPSCOT QUARRY**

SHOT #	PPVT	PPVV	PPVL	dB(L)	TONS +/-	LOCATION	DISTANCE
32A & 32B	0.095	0.1	0.1	130	10,664	Quarry Entrance	1,240 ft.
	0.115	0.15	0.115	126		Flaig residence 1	1,090 ft.
	0.17	0.15	0.14	124		Flaig residence 2	1,090 ft.
	0.085	0.08	0.11	126		Justice residence	1,960 ft.
	0.89	0.76	0.59	128		Quarry Floor	250 ft.
	0.055	0.035	0.075	118		Bates residence	1,990 ft.
33	0.235	0.26	0.355	117	4,873	Quarry Entrance	1,010 ft.
	0.32	0.39	0.39	121		Flaig residence 1	940 ft.
	0.295	0.39	0.47	119		Flaig residence 2	940 ft.
	0.125	0.105	0.155	114		Justice residence	1,935 ft.
	0.96	3.24	1.96	134		Quarry Floor	400 ft.
	0.035	0.025	0.045	119		Bates residence	2,120 ft.
34	0.035	0.075	0.045	124	10,524	Quarry Entrance	1,710 ft.
	0.04	0.06	0.035	124		Flaig residence 1	1,610 ft.
	0.06	0.065	0.09	122		Flaig residence 2	1,610 ft.
	0.105	0.11	0.095	115		Justice residence	1,950 ft.
	1.36	1.16	1.32	128		Quarry Floor	200 ft.
	0.095	0.05	0.06	113		Bates residence	1,900 ft.

Enclosed with this summary report please find the following H.C. Crooker & Sons blast event data for each 'shot': 1) Crooker's internal "Cover Letter" report, 2) Blast design for each 'shot' showing hole layout and firing sequence, the amount of explosives used, estimated rock tonnage, etc., and 3) Monitoring station data reports for each 'shot' from the 6 monitoring locations.

**COVER LETTER SHOT PEJ 01-32A & 32B  
10/09/01**

**SHOTS 32A & 32B WERE LOCATED ON THE UPPER-2.5 & UPPER-3 LEVELS WITH DRILLING TO ELEVATION 120 & 95.**

MONITORING WAS DONE AT T. JUSTICE, R. FLAIG, G. BATES, AND THE QUARRY ENTRANCE ROAD. WATER LEVELS, CRACK MONITORS, AND SEISMOGRAPH DATA WERE ALL COLLECTED.

THIS SHOT WAS THE **THIRTY-SECOND** FOR THIS SEASON. THIS BEING THE **FIRST** FOR THE DAY WITH **THREE SHOTS** SCHEDULED.

**SHOTS 32A & 32B WERE PRODUCTION SHOTS WITH ONE FREE FACE EACH. IN THIS AREA WE ARE NOT DECKING BETWEEN THE TOP AND BOTTOM. THIS WAS USING 350ms IN HOLE WITH 25ms & 17ms SURFACE DELAYS. THIS WAS A NON-ELECTRIC SHOT.**

WE USED EXGEL FOR THE BOTTOM LOAD IN SHOT 32A TO GIVE MORE MOVEMENT.

IT FIRED AT **11:43 AM**. THE SHOTS HAD GOOD MOVEMENT AND PRODUCED GOOD BREAKAGE. THE SHOT LOADED VERY WELL IN THE LEAST LOADING TIME. WEATHER CONDITIONS WERE MOSTLY CLEAR WITH **WINDS SOUTH AT 14 MPH**, WITH TEMPERATURES AT 53 DEGREES.

TIM RATH WITH GREEN MOUNTAIN TIMED AND DELAYED THE SHOT.

FROM CROOKER : B. SELMER, J. HANNA, J. MORRELL, & L. ROUNA HELPED WITH THE SHOT.

FROM GREEN MOUNTAIN: BILL MCGOLDRICK AND DAVE ADAMS

AS THE MONITORING DATA SHOWS WE STAYED WITH IN OUR LIMITS. WE RECORDED ALL DATA FOR OUR RECORDS THUS MAKING THEM AVAILABLE IF THE CODES OFFICE OR THE M.D.E.P. WANTS TO REVIEW THEM AT ANY TIME.

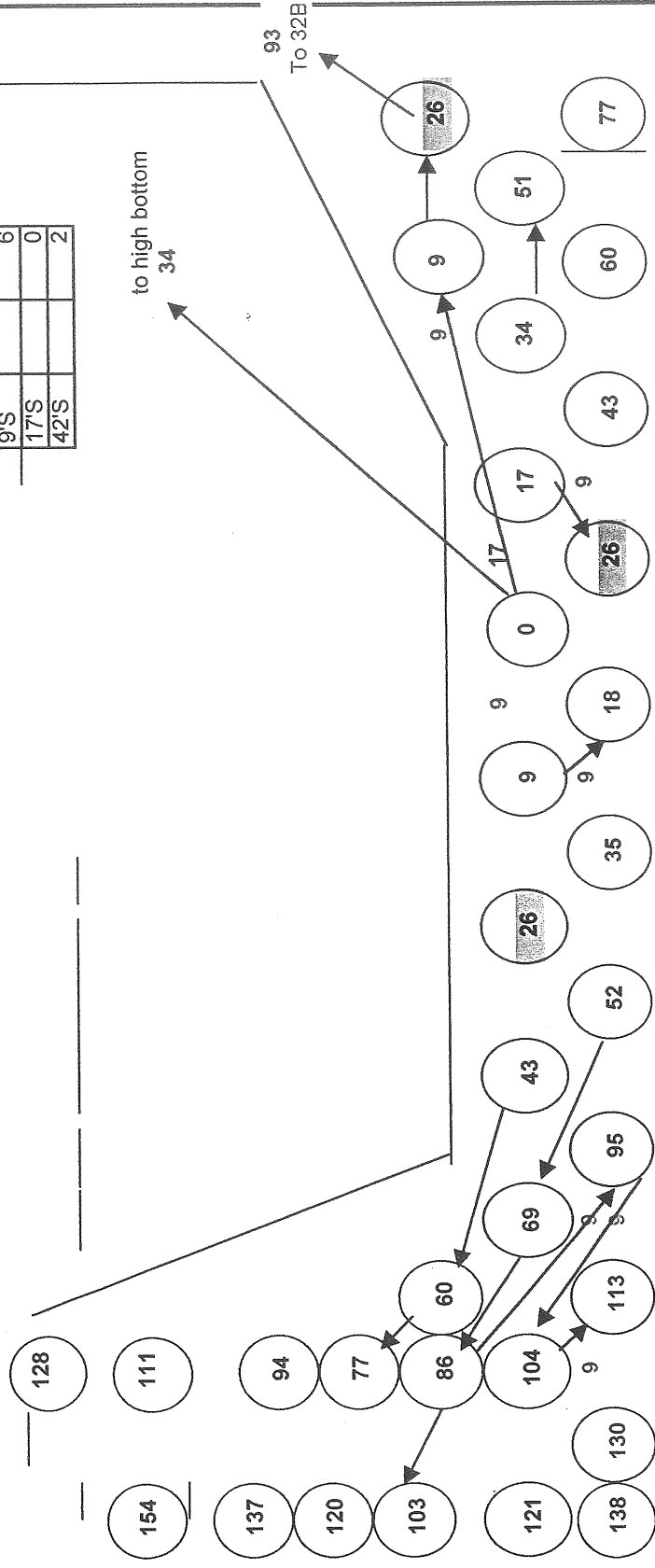
A GROUP FROM PORTLAND ALONG WITH DRAGON PRODUCTS WERE PRESENT TO WITNESS THE SHOTS.

THE TOPSHAM CODES OFFICER WAS NOT PRESENT.

RESPECTFULLY,  
RICHARD MORGAN  
AGGREGATE SUPERINTENDENT



HOT #	PEJ 01-32A	FLOOR ELEVATION=	95	8 X 8	25--35/40 FT	0
DATE	10/9/01				25--37/60 FT	0
					17--35/30 FT	33
					17--35/60 FT	33
					9'S	6
					17'S	0
					42'S	2

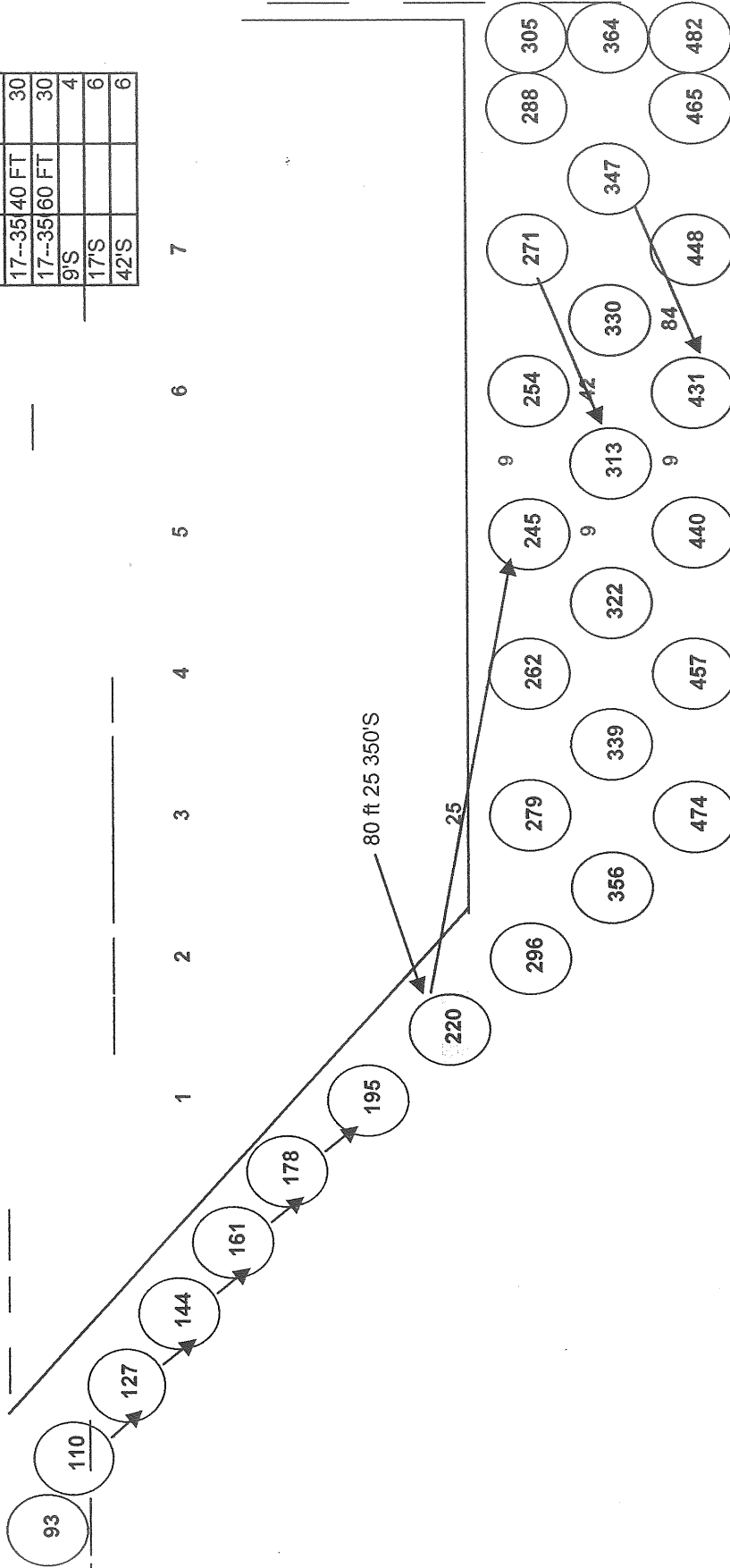


HOT NO.:	PEJ 01-32A	DATE:	10/9/01	FOOTAGE:	715	EXPLOSIVES POUNDS	
WEATHER	53 DEG Clear	TIME:	11:43 AM	AVG. DEPTH:	25	HOLES PER DELAY	
WIND	S 8 MPH	HOLES LOST:	N/A	TONNAGE:	3,230	LBS PER HOLE	
O. OF HOLES	33	BURDEN	8	TIMER SETTING:	17ms 350'S NON ELECTRIC	LBS PER DELAY	
PACING:	8	FACE	25	LEVEL	UPPER-3	TOTAL	
						1669	

10/9/01 3:19 PM

01\_shots 01-32B

HOT #	PEJ 01-32B	FLOOR ELEVATION=	120	8 X 10	25--35	40 FT	0
DATE	10/9/01				25--35	60 FT	0
					25--35	80 FT	2
					17--35	40 FT	30
					17--35	60 FT	30
					9'S		4
					17'S		6
					42'S		6



HOT NO.:	PEJ 01-32B	DATE:	10/9/01	FOOTAGE:	1256	EXPLOSIVES POUNDS	
WEATHER	53 DEG Clear	TIME:	11:43 AM	AVG. DEPTH:	46	HOLES PER DELAY	1
WIND	S 8 MPH	HOLES LOST:	N/A	TONNAGE:	7,434	LBS PER HOLE	119
O. OF HOLES	30	BURDEN	8	TIMER SETTING:	25ms 350'S NON ELECTRIC	LBS PER DELAY	119
PACING:	10	FACE	45	LEVEL	UPPER-2.5	TOTAL	3575

# Event Report

**Date/Time** Vert at 11:43:41 AM October 9, 2001  
**Trigger Source** Geo: 0.0200 in/s  
**Range** Geo :10.0 in/s  
**Record Time** 3.0 sec at 1024 sps

**Serial Number** 1271 V 5.51 BlastMate II/477  
**Battery Level** 6.3 Volts  
**Calibration** February 7, 2001 by InstanTel Inc.  
**File Name** C2718R5C.KT0

**Notes**

Location: QUARRY ENTRANCE  
 Client: Harry C. Crooker & Sons, Inc.  
 User Name: JOE HANNA  
 Converted: October 9, 2001 3:47:02 PM (V4.30)

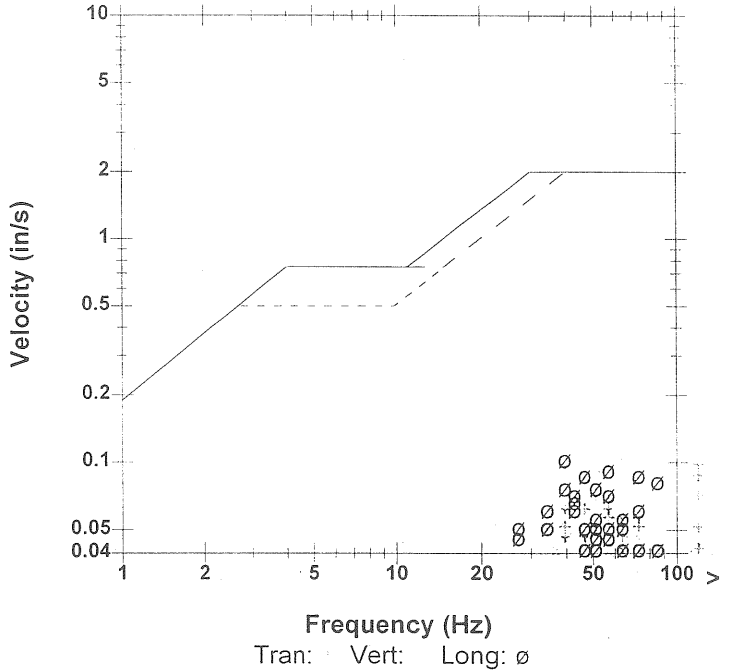
**Extended Notes**

AT THE ENTRANCE TO WELL B-101 NEXT TO QUARRY  
 ENTRANCE ROAD/1240 FT FROM SHOTS PEJ 01-32A & 3  
 2B  
 ON THE UPPER-2.5 AND UP PER-3 LEVELS AT GRID BL -  
 1+75  
 TO -0+25 AND L1500 TO L1600

**Post Event Notes**

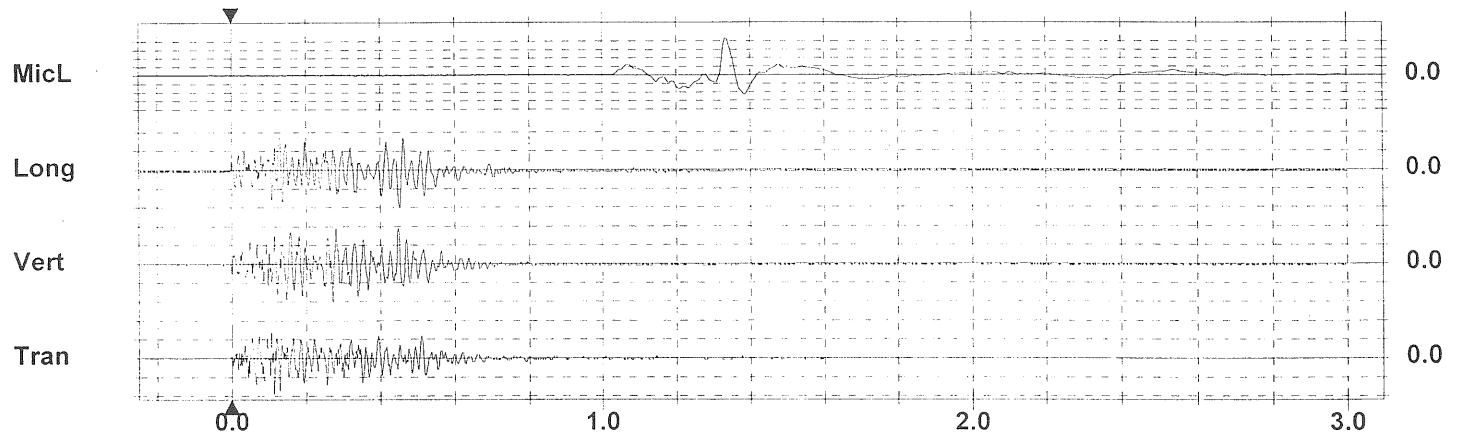
**Microphone** Linear Weighting  
**PSPL** 129.6 dB(L) at 1.333 sec  
**ZC Freq** 11 Hz  
**Channel Test** Passed (Freq = 20.0 Hz Amp = 244 mv)

**USBM RI8507 And OSMRE**



	Tran	Vert	Long	
PPV	0.0950	0.100	0.100	in/s
ZC Freq	>100	73	39	Hz
Time (Rel. to Trig)	0.116	0.273	0.453	sec
Peak Acceleration	0.172	0.119	0.119	g
Peak Displacement	0.00021	0.00030	0.00041	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.128 in/s at 0.450 sec



Time Scale: 0.20 sec/div    Amplitude Scale: Geo: 0.0500 in/s/div Mic: 0.00200 psi(L)/div  
 Trigger =

# Event Report

Date/Time Long at 11:43:39 AM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo: 10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 1272 V 5.51 BlastMate II/477  
 Battery Level 6.3 Volts  
 Calibration January 30, 2001 by InstanTel Inc.  
 File Name C2728R5C.KR0

## Notes

Location: ROGER FLAIG-OLD LEWISTON ROAD  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: MAURIC MORGAN  
 Converted: October 9, 2001 3:46:58 PM (V4.30)

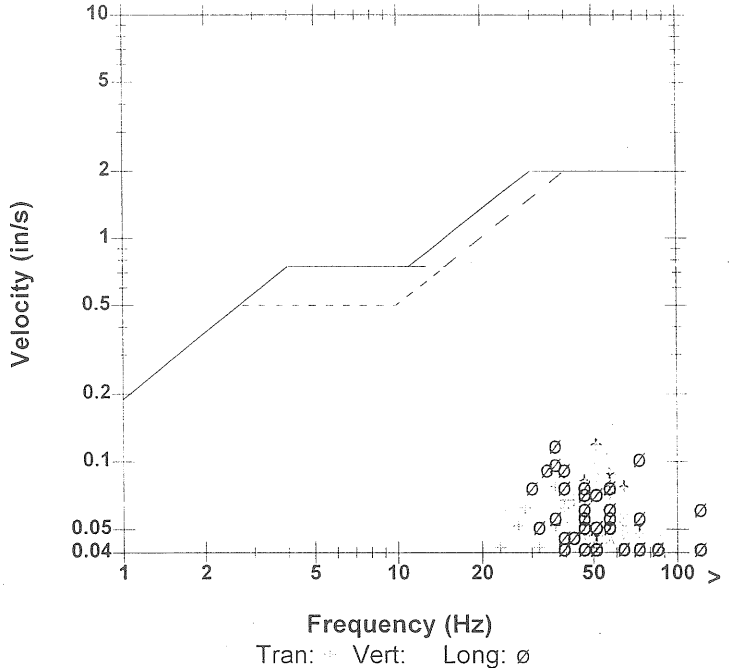
## Extended Notes

20 FEET OFF S.W. CORNER OF HOUSE IN DRIVEWAY 10  
 90 FT  
 FROM SHOTS PEJ 01-32A & 32B ON THE UPPER-2.5 AND  
 UPPER-3 LEVELS A T GRID BL -1+75 TO -0+25 AND L150  
 0 TO

## Post Event Notes

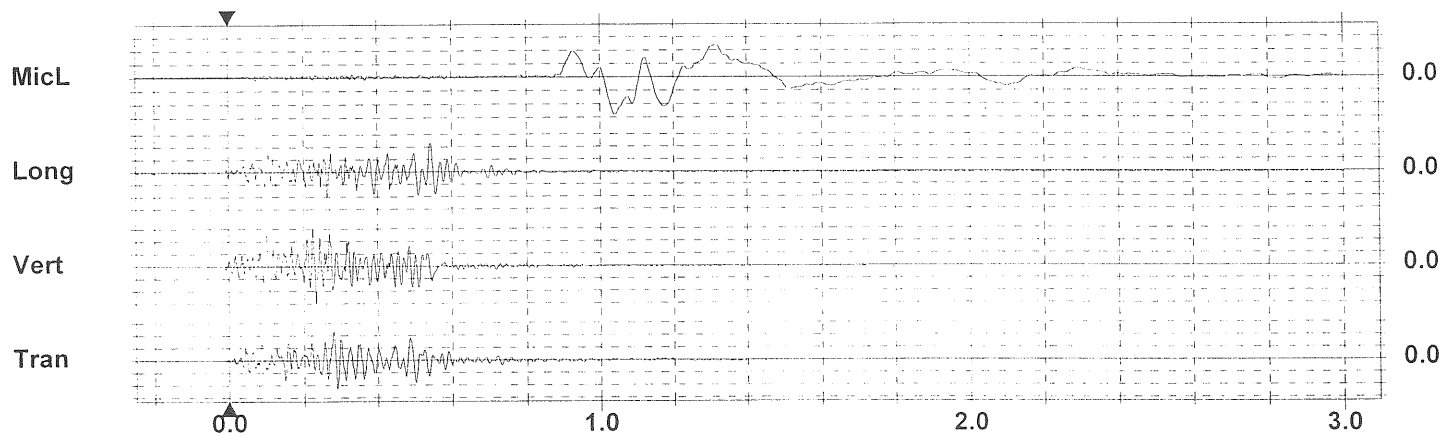
Microphone Linear Weighting  
 PSPL 125.8 dB(L) at 1.039 sec  
 ZC Freq 5.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 269 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.115	0.150	0.115	in/s
ZC Freq	34	57	37	Hz
Time (Rel. to Trig)	0.280	0.225	0.543	sec
Peak Acceleration	0.119	0.159	0.106	g
Peak Displacement	0.00046	0.00042	0.00052	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.154 in/s at 0.225 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.0500 in/s/div Mic: 0.00200 psi(L)/div  
 Trigger =

# Event Report

**Date/Time** Vert at 11:41:37 AM October 9, 2001  
**Trigger Source** Geo: 0.0200 in/s  
**Range** Geo :10.0 in/s  
**Record Time** 3.0 sec at 1024 sps

**Serial Number** 0891 V 5.51 BlastMate II/477  
**Battery Level** 6.4 Volts  
**Calibration** February 1, 2001 by InstanTel Inc.  
**File Name** B8918R5C.HD0

## Notes

**Location:** ROGER FLAIG-OLD LEWISTON ROAD  
**Client:** HARRY C. CROOKER & SONS, INC.  
**User Name:** MAURICE MORGAN  
**Converted:** October 9, 2001 3:46:49 PM (V4.30)

## Extended Notes

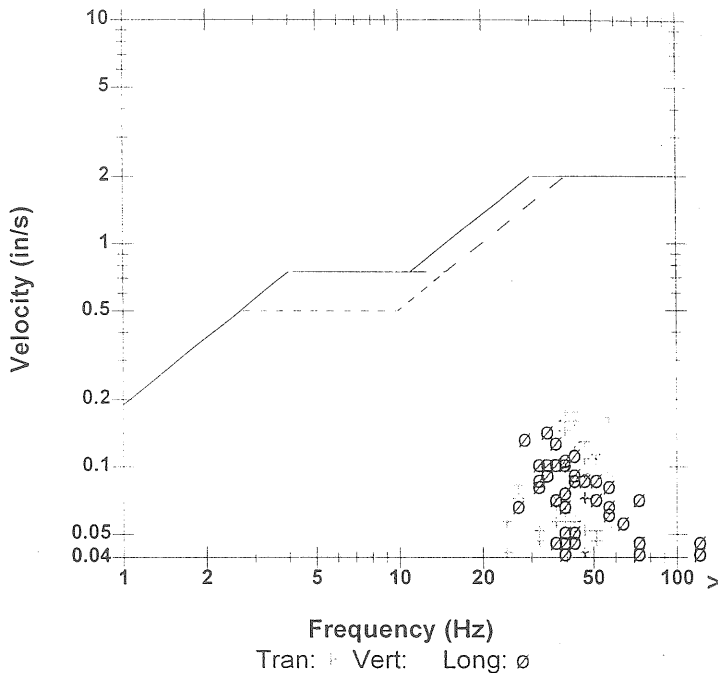
20 FEET OFF S.W. CORNER OF HOUSE IN DRIVEWAY 10  
 90 FT  
 FROM SHOTS PEJ 01-32A & 32B ON THE UPPER-2.5 AND

UPPER-3 LEVELS A T GRID BL -1+75 TO -0+25 AND L150  
 0 TO

## Post Event Notes

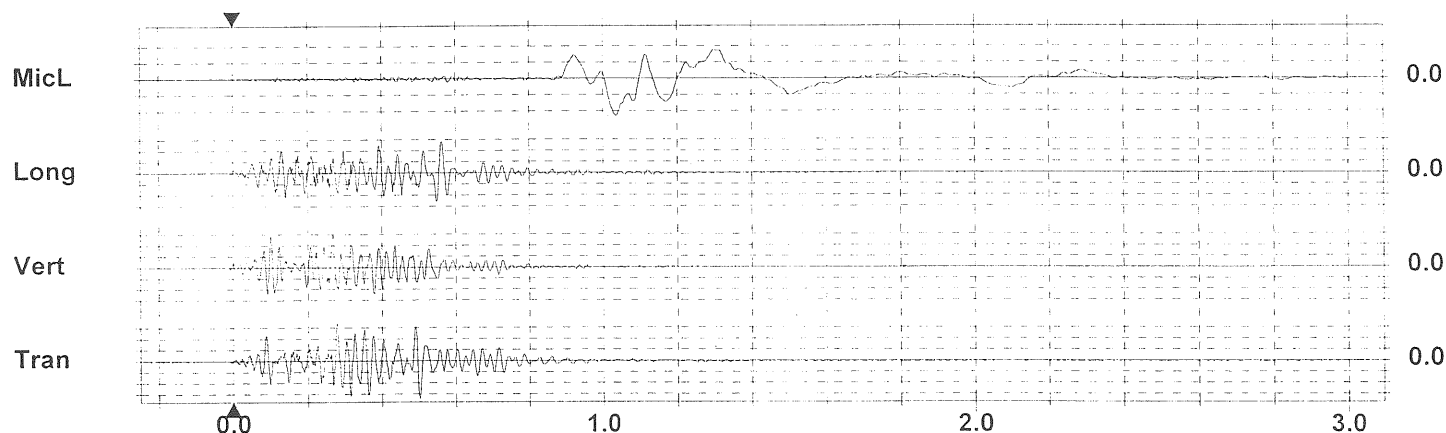
**Microphone** Linear Weighting  
**PSPL** 124.1 dB(L) at 1.036 sec  
**ZC Freq** 5.0 Hz  
**Channel Test** Passed (Freq = 20.0 Hz Amp = 520 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.170	0.150	0.140	in/s
ZC Freq	43	37	34	Hz
Time (Rel. to Trig)	0.279	0.269	0.562	sec
Peak Acceleration	0.146	0.146	0.119	g
Peak Displacement	0.00070	0.00054	0.00068	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.205 in/s at 0.279 sec



**Time Scale:** 0.20 sec/div **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00200 psi(L)/div  
**Trigger =** ▸ - - - ▸

# Event Report

**Date/Time** Long at 11:43:39 AM October 9, 2001  
**Trigger Source** Geo: 0.0200 in/s  
**Range** Geo :10.0 in/s  
**Record Time** 3.0 sec at 1024 sps

**Serial Number** 1756 V 5.51 BlastMate II/477  
**Battery Level** 6.4 Volts  
**Calibration** January 30, 2001 by InstanTel Inc.  
**File Name** C7568R5C.KR0

**Notes**

Location: TIM JUSTICE-OLD LEWISTON ROAD  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: DALE MORGAN  
 Converted: October 9, 2001 3:47:00 PM (V4.30)

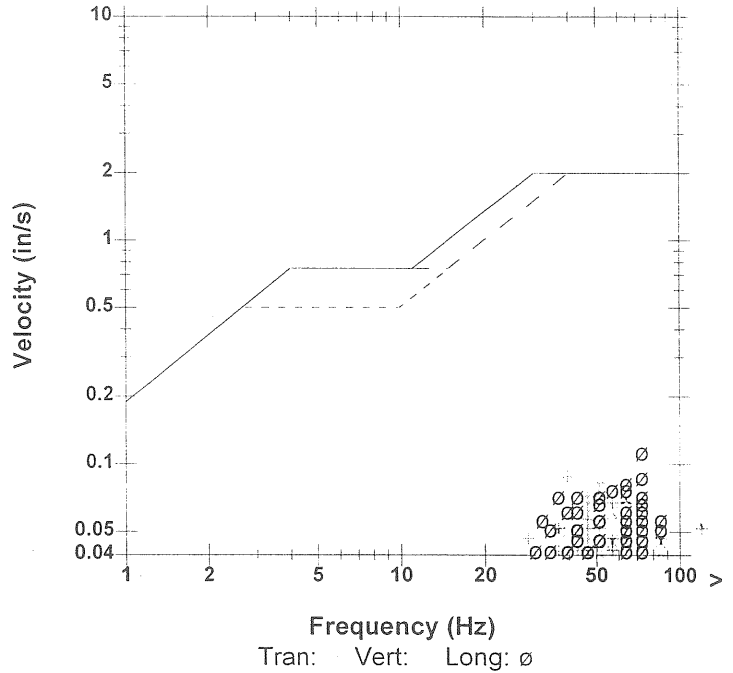
**Extended Notes**

NEXT TO ACTIVE WELL IN FORK OF DRIVEWAY/1960 FE ET  
 FROM SHOTS PEJ 01-32A & 32B ON THE UPPER-2.5 AND  
 UPPER-3 LEVELS AT G RID BL -1+75 TO -0+25 AND L150  
 0 TO

**Post Event Notes**

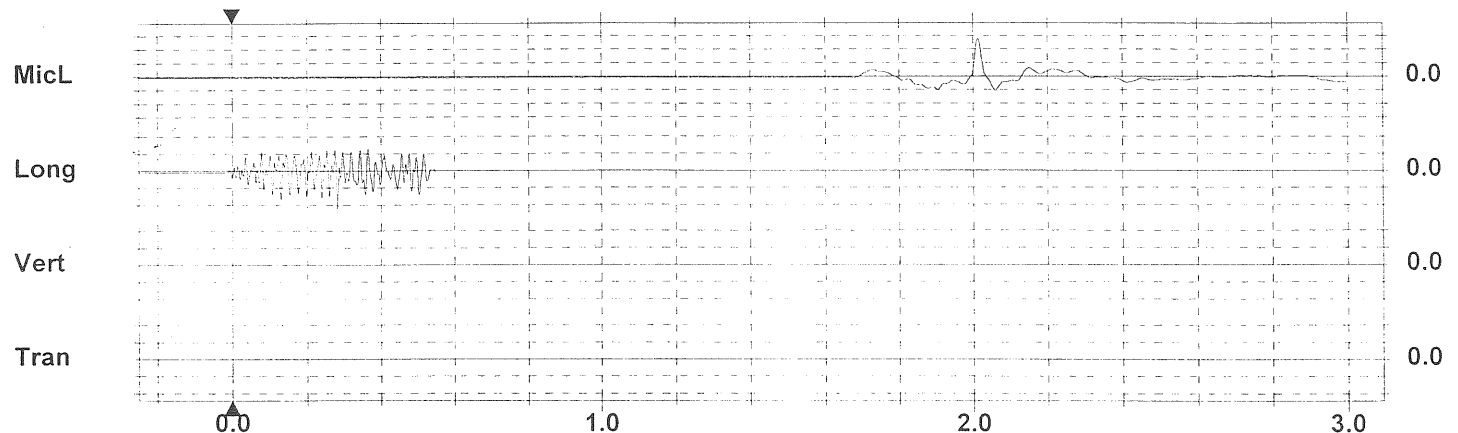
**Microphone** Linear Weighting  
**PSPL** 125.7 dB(L) at 2.015 sec  
**ZC Freq** 13 Hz  
**Channel Test** Passed (Freq = 20.0 Hz Amp = 264 mv)

**USBM RI8507 And OSMRE**



	Tran	Vert	Long	
PPV	0.0850	0.0800	0.110	in/s
ZC Freq	39	>100	73	Hz
Time (Rel. to Trig)	0.304	0.123	0.284	sec
Peak Acceleration	0.106	0.133	0.119	g
Peak Displacement	0.00025	0.00021	0.00026	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.129 in/s at 0.284 sec



**Time Scale:** 0.20 sec/div    **Amplitude Scale:** Geo: 0.0500 in/s/div Mic: 0.00200 psi(L)/div  
**Trigger =** ▶ --- ◀

# Event Report

Date/Time Vert at 11:43:35 AM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo :5.00 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 3988 V 2.6 MiniMate  
 Battery Level 6.4 Volts  
 Calibration January 31, 2001 by InstanTel Inc.  
 File Name E9888R5C.KN0

## Notes

Location: IN THE QUARRY  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: DICK MORGAN  
 Converted: October 9, 2001 3:46:56 PM (V4.30)

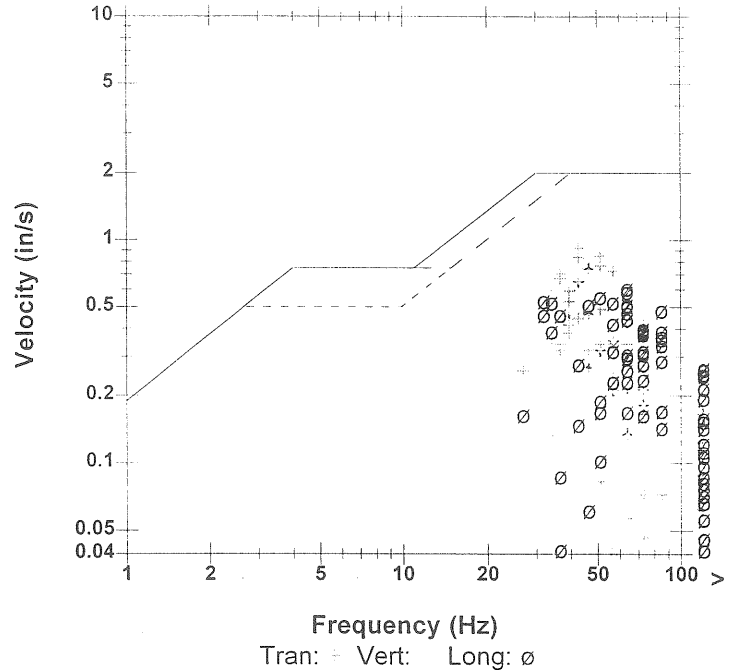
## Extended Notes

ON THE QUARRY FLOOR NEXT TO BLAST  
 SHELTER/VARIABLE 200-500 FEET FROM SHOTS PEJ  
 01-32A, 32B, 33, 34A, & 34B UPPER, UPPER -2, 2.5, & 3  
 LEVELS/SEE NOTES FOR GRID LOCATIONS

## Post Event Notes

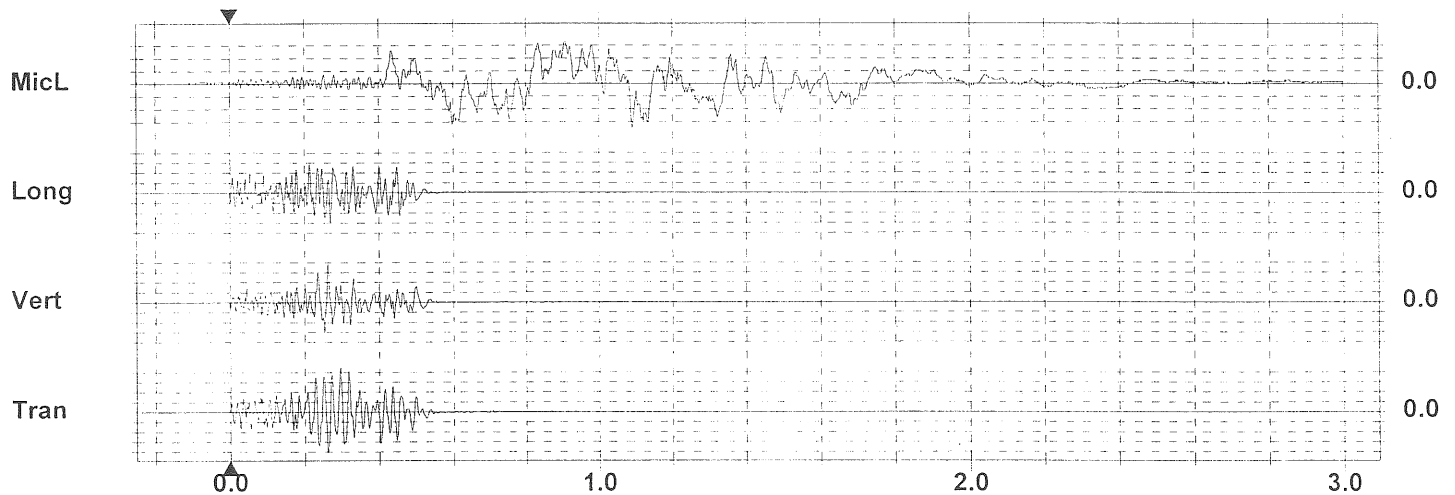
Microphone Linear Weighting  
 PSPL 127.6 dB(L) at 1.090 sec  
 ZC Freq 8.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 466 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.890	0.760	0.590	in/s
ZC Freq	43	47	64	Hz
Time (Rel. to Trig)	0.298	0.264	0.271	sec
Peak Acceleration	0.742	0.583	0.597	g
Peak Displacement	0.00317	0.00247	0.00231	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 1.13 in/s at 0.264 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.200 in/s/div Mic: 0.00200 psi(L)/div  
 Trigger =

# Event Report

Date/Time Tran at 11:43:42 AM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo: 10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 0541 V 5.51 BlastMate II/477  
 Battery Level 6.5 Volts  
 Calibration February 1, 2001 by InstanTel Inc.  
 File Name B5418R5C.KU0

## Notes

Location: G.BATES-ROCKY HILL ESTATES  
 Client: Harry C. Crooker & Sons, Inc.  
 User Name: RICHARD GOWER  
 Converted: October 9, 2001 3:47:03 PM (V4.30)

## Extended Notes

ON LAWN 12 FEET FROM CORNER OF GARAGE AND 199  
 0 FT  
 FROM SHOTS PEJ 01-32A & 32B ON THE UPPER-2.5 AND  
 UPPER-3 LEVELS AT G RID BL -1+75 TO -0+25 AND L150  
 0 TO

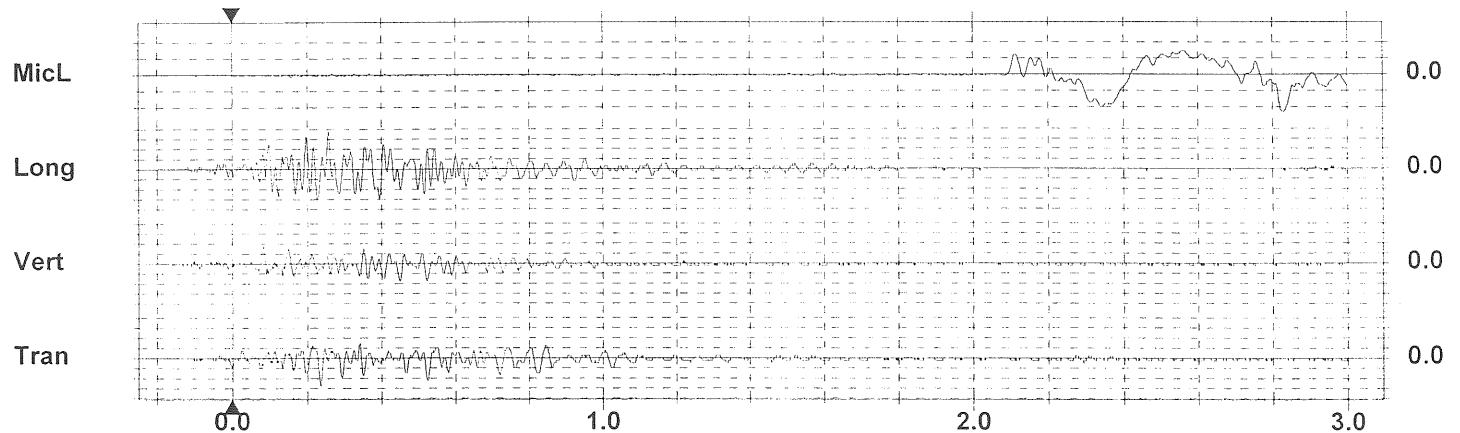
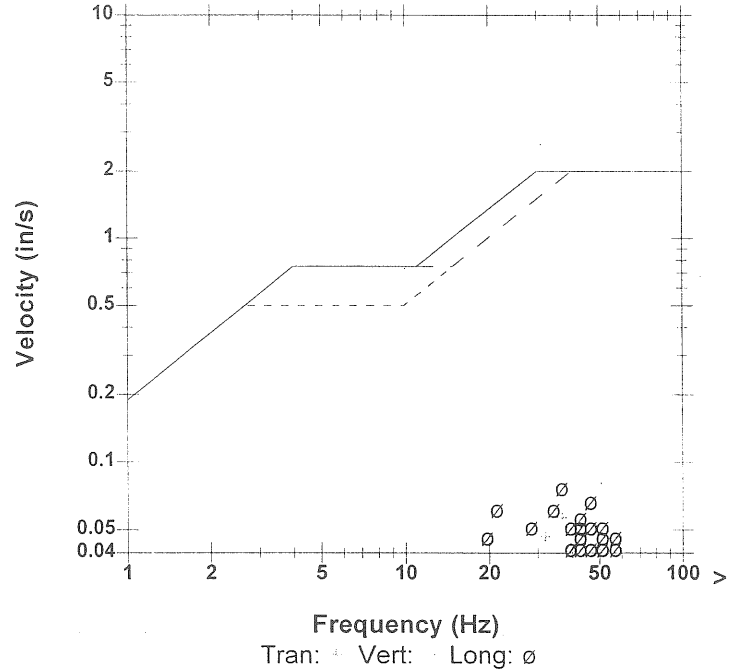
## Post Event Notes

Microphone Linear Weighting  
 PSPL 118.1 dB(L) at 2.827 sec  
 ZC Freq 4.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 265 mv)

	Tran	Vert	Long	
PPV	0.0550	0.0350	0.0750	in/s
ZC Freq	37	39	37	Hz
Time (Rel. to Trig)	0.235	0.083	0.258	sec
Peak Acceleration	0.0398	0.0398	0.0530	g
Peak Displacement	0.00023	0.00016	0.00044	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.0750 in/s at 0.258 sec

## USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div  
 Trigger = ▶ - - - ◀



COVER LETTER SHOT PEJ 01-33  
10/09/01

**SHOT 33** WAS LOCATED ON THE UPPER-2 LEVEL WITH DRILLING TO ELEVATION 145. MONITORING WAS DONE AT T. JUSTICE, R. FLAIG, G. BATES, AND THE QUARRY ENTRANCE ROAD. WATER LEVELS, CRACK MONITORS, AND SEISMOGRAPH DATA WERE ALL COLLECTED.

THIS SHOT WAS THE **THIRTY-THIRD** FOR THIS SEASON. THIS BEING THE **SECOND** FOR THE DAY WITH **THREE SHOTS** SCHEDULED.

**SHOT 33** WAS A PRODUCTION SHOT WORKING TO OUR BOUNDARIES WITH TWO FREE FACES. IN THIS AREA WE ARE NOT DECKING BETWEEN THE TOP AND BOTTOM. THIS WAS USING 350ms IN HOLE WITH 25ms SURFACE DELAYS. THIS WAS A NON-ELECTRIC SHOT.

IT FIRED AT **12:21 PM**. THE SHOT HAD GOOD MOVEMENT AND PRODUCED GOOD BREAKAGE. THE SHOT LOADED VERY WELL IN THE LEAST LOADING TIME. WEATHER CONDITIONS WERE MOSTLY CLEAR WITH **WINDS SOUTH AT 14 MPH**, WITH TEMPERATURES AT **53 DEGREES**.  
DICK MORGAN TIMED AND DELAYED THE SHOT.

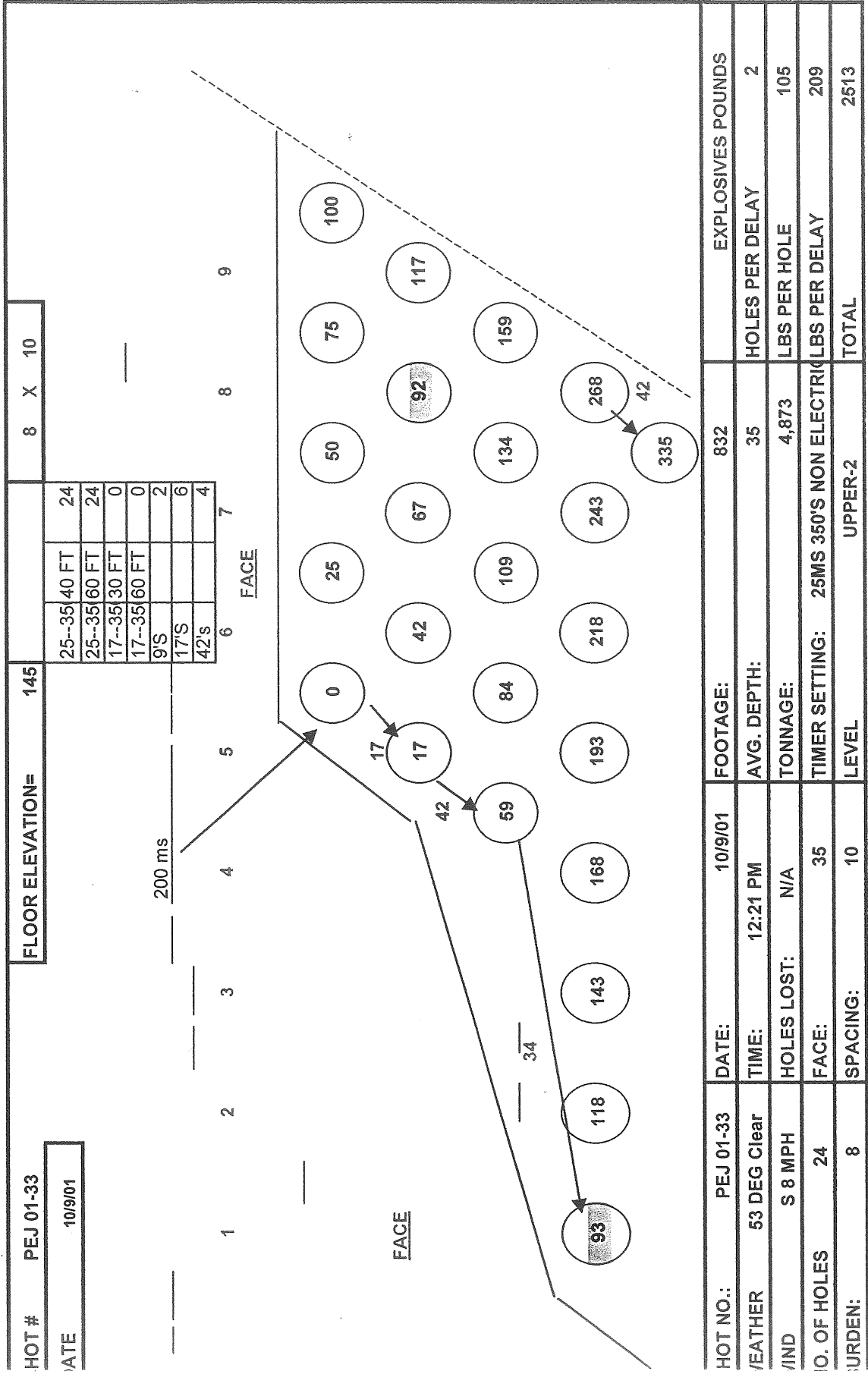
FROM CROOKER : D. MORGAN, B. SELMER, J. HANNA, J. MORRELL, & L. ROUNA HELPED WITH THE SHOT.  
FROM GREEN MOUNTAIN: BILL MCGOLDRICK AND DAVE ADAMS

AS THE MONITORING DATA SHOWS WE STAYED WITH IN OUR LIMITS. WE RECORDED ALL DATA FOR OUR RECORDS THUS MAKING THEM AVAILABLE IF THE CODES OFFICE OR THE M.D.E.P. WANTS TO REVIEW THEM AT ANY TIME.

A GROUP FROM PORTLAND ALONG WITH DRAGON PRODUCTS WERE PRESENT TO WITNESS THE SHOTS.

THE TOPSHAM CODES OFFICER WAS NOT PRESENT.

RESPECTFULLY,  
RICHARD MORGAN  
AGGREGATE SUPERINTENDENT



# Event Report

Date/Time Vert at 12:21:21 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo :10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 1271 V 5.51 BlastMate II/477  
 Battery Level 6.4 Volts  
 Calibration February 7, 2001 by InstanTel Inc.  
 File Name C2718R5E.BL0

## Notes

Location: QUARRY ENTRANCE  
 Client: Harry C. Crooker & Sons, Inc.  
 User Name: JOE HANNA  
 Converted: October 9, 2001 3:47:12 PM (V4.30)

## Extended Notes

AT THE ENTRANCE TO WELL B-101 NEXT TO QUARRY  
 ENTRANCE ROAD/1010 FT FROM SHOTS PEJ 01-33  
 ON THE UPPER-2 level at grid bl-0+50 to 0+00 and I1825 to  
 I1875

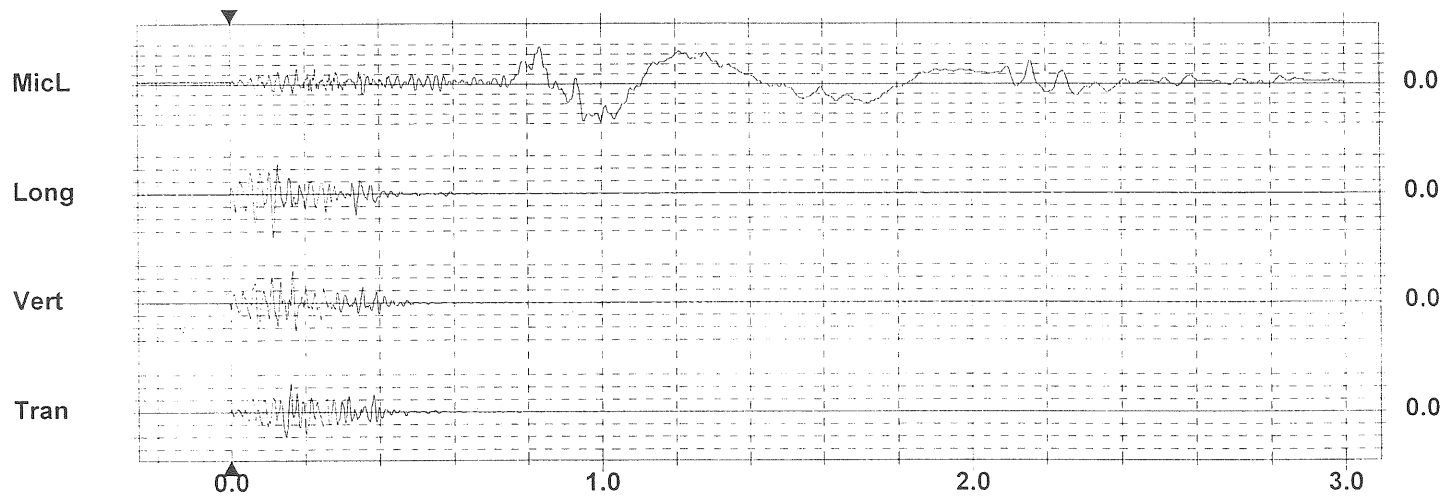
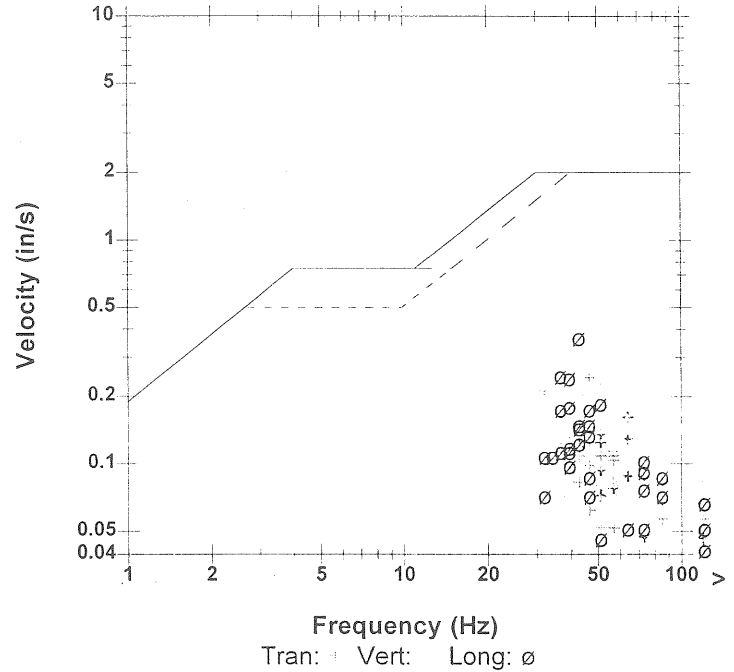
## Post Event Notes

Microphone Linear Weighting  
 PSPL 116.6 dB(L) at 1.000 sec  
 ZC Freq 3.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 244 mv)

	Tran	Vert	Long	
PPV	0.235	0.260	0.355	in/s
ZC Freq	47	51	43	Hz
Time (Rel. to Trig)	0.161	0.168	0.115	sec
Peak Acceleration	0.186	0.252	0.212	g
Peak Displacement	0.00104	0.00080	0.00121	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.374 in/s at 0.115 sec

## USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.100 in/s/div Mic: 0.00050 psi(L)/div  
 Trigger =  $\blacktriangleleft$  ---  $\blacktriangleright$

# Event Report

Date/Time Vert at 12:21:19 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo :10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 1272 V 5.51 BlastMate II/477  
 Battery Level 6.3 Volts  
 Calibration January 30, 2001 by InstanTel Inc.  
 File Name C2728R5E.BJO

## Notes

Location: ROGER FLAIG-OLD LEWISTON ROAD  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: MAURIC MORGAN  
 Converted: October 9, 2001 3:47:08 PM (V4.30)

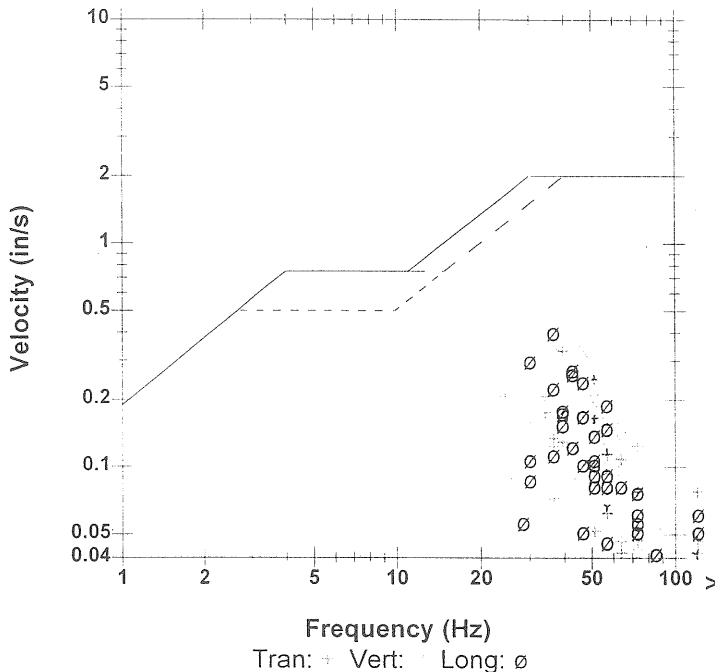
## Extended Notes

20 FEET OFF S.W. CORNER OF HOUSE IN DRIVEWAY 9  
 40 FT  
 FROM SHOTS PEJ 01-33ON THE UPPER-2 LEVEL AT GRI  
 D BL -0+50 TO 0+00 AND L1825 TO L1875

## Post Event Notes

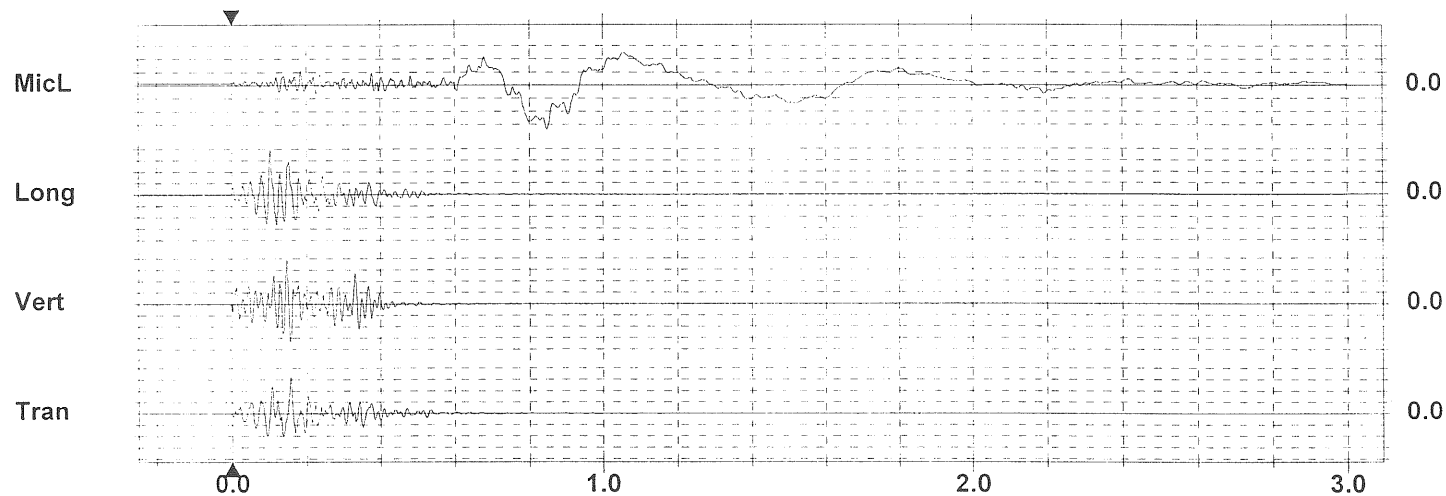
Microphone Linear Weighting  
 PSPL 121.4 dB(L) at 0.850 sec  
 ZC Freq 2.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 269 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.320	0.390	0.390	in/s
ZC Freq	37	57	37	Hz
Time (Rel. to Trig)	0.158	0.147	0.104	sec
Peak Acceleration	0.199	0.318	0.305	g
Peak Displacement	0.00117	0.00116	0.00141	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.464 in/s at 0.157 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.100 in/s/div Mic: 0.00100 psi(L)/div  
 Trigger =

# Event Report

Date/Time Vert at 12:19:16 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo :10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 0891 V 5.51 BlastMate II/477  
 Battery Level 6.4 Volts  
 Calibration February 1, 2001 by InstanTel Inc.  
 File Name B8918R5E.840

## Notes

Location: ROGER FLAIG-OLD LEWISTON ROAD  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: MAURICE MORGAN  
 Converted: October 9, 2001 3:47:05 PM (V4.30)

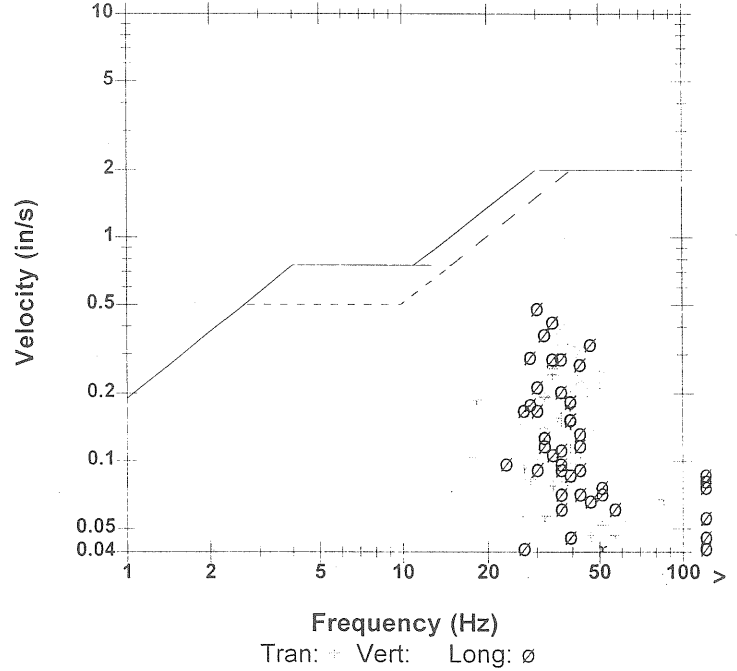
## Extended Notes

20 FEET OFF S.W. CORNER OF HOUSE IN DRIVEWAY 9  
 40 FT  
 FROM SHOTS PEJ 01-33 ON THE UPPER-2 LEVEL AT GR  
 ID BL -0+50 TO 0+ 00 AND L1825 TO L1875

## Post Event Notes

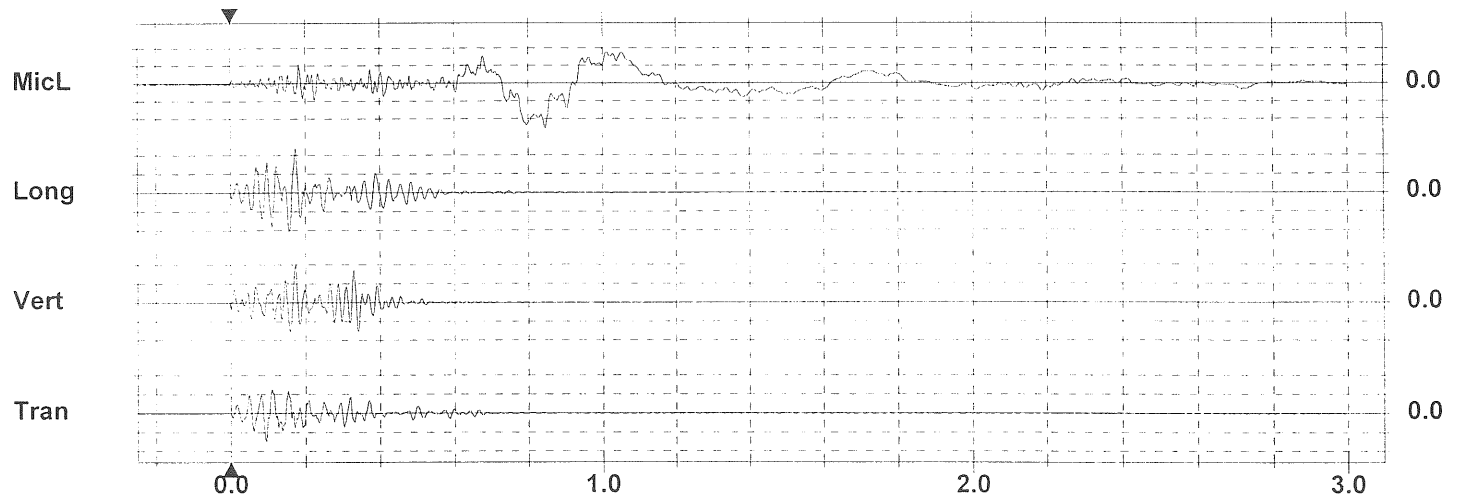
Microphone Linear Weighting  
 PSPL 118.8 dB(L) at 0.846 sec  
 ZC Freq 3.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 527 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.295	0.390	0.470	in/s
ZC Freq	28	37	30	Hz
Time (Rel. to Trig)	0.096	0.175	0.175	sec
Peak Acceleration	0.199	0.265	0.292	g
Peak Displacement	0.00133	0.00153	0.00224	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.619 in/s at 0.175 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.200 in/s/div Mic: 0.00100 psi(L)/div  
 Trigger = ▶ --- ◀

# Event Report

Date/Time Vert at 12:21:19 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo: 10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 1756 V 5.51 BlastMate II/477  
 Battery Level 6.4 Volts  
 Calibration January 30, 2001 by InstanTel Inc.  
 File Name C7568R5E.BJ0

## Notes

Location: TIM JUSTICE-OLD LEWISTON ROAD  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: DALE MORGAN  
 Converted: October 9, 2001 3:47:10 PM (V4.30)

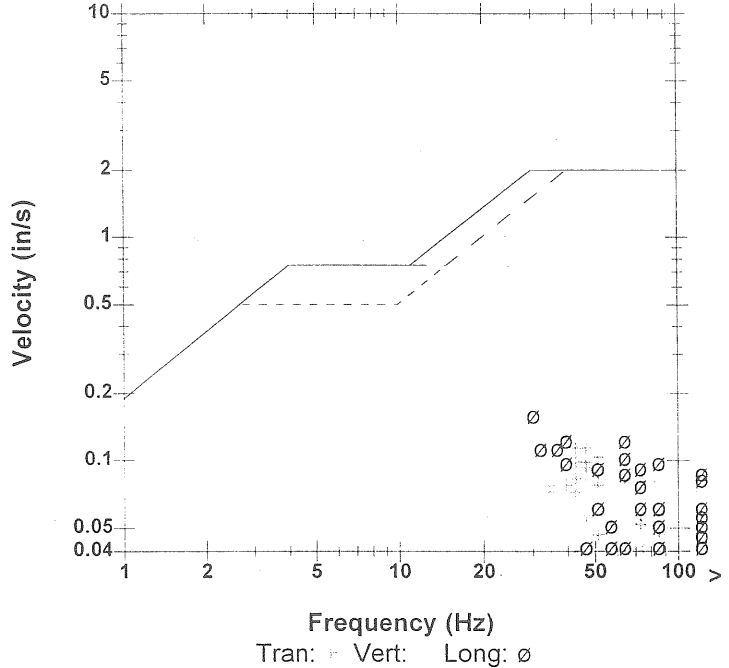
## Extended Notes

NEXT TO ACTIVE WELL IN FORK OF DRIVEWAY 1935 FE  
 ET  
 FROM SHOTS PEJ 01-33 ON THE UPPER-2 LEVEL AT GRI  
 D BL -0+50 TO 0+00 AND L1825 TO L1875

## Post Event Notes

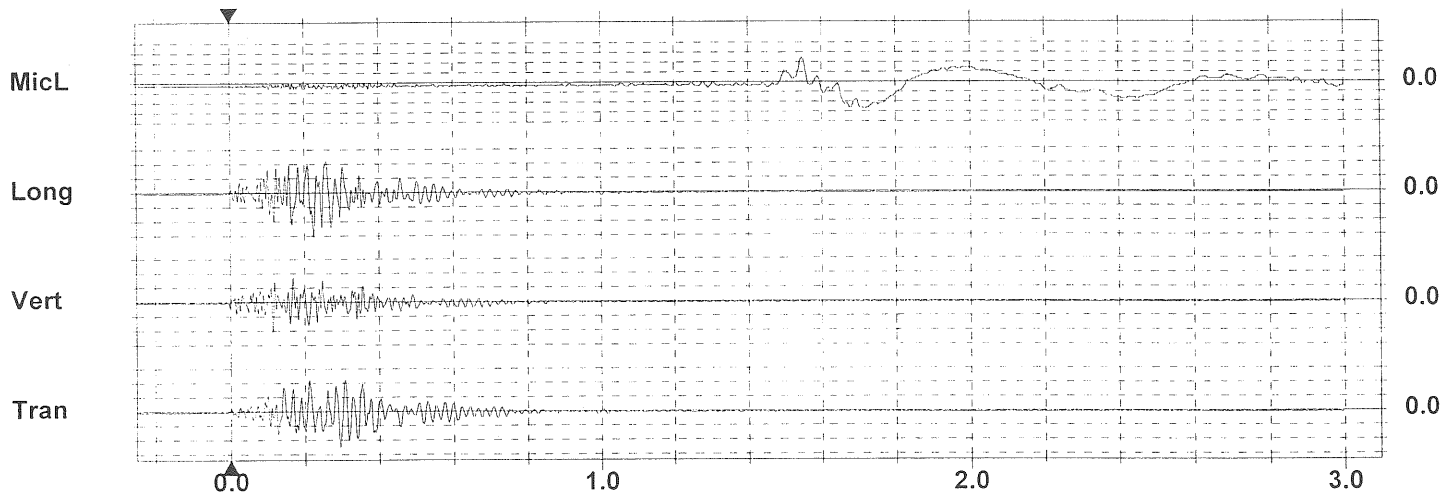
Microphone Linear Weighting  
 PSPL 113.5 dB(L) at 1.715 sec  
 ZC Freq 3.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 262 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.125	0.105	0.155	in/s
ZC Freq	43	85	30	Hz
Time (Rel. to Trig)	0.295	0.116	0.226	sec
Peak Acceleration	0.0928	0.146	0.146	g
Peak Displacement	0.00047	0.00032	0.00068	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.173 in/s at 0.226 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.0500 in/s/div Mic: 0.00050 psi(L)/div  
 Trigger = ▶ --- ◀

# Event Report

**Date/Time** Vert at 12:21:14 PM October 9, 2001  
**Trigger Source** Geo: 0.0200 in/s  
**Range** Geo :5.00 in/s  
**Record Time** 3.0 sec at 1024 sps

**Serial Number** 3988 V 2.6 MiniMate  
**Battery Level** 6.4 Volts  
**Calibration** January 31, 2001 by InstanTel Inc.  
**File Name** E9888R5E.BE0

**Notes**

Location: IN THE QUARRY  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: DICK MORGAN  
 Converted: October 9, 2001 3:47:06 PM (V4.30)

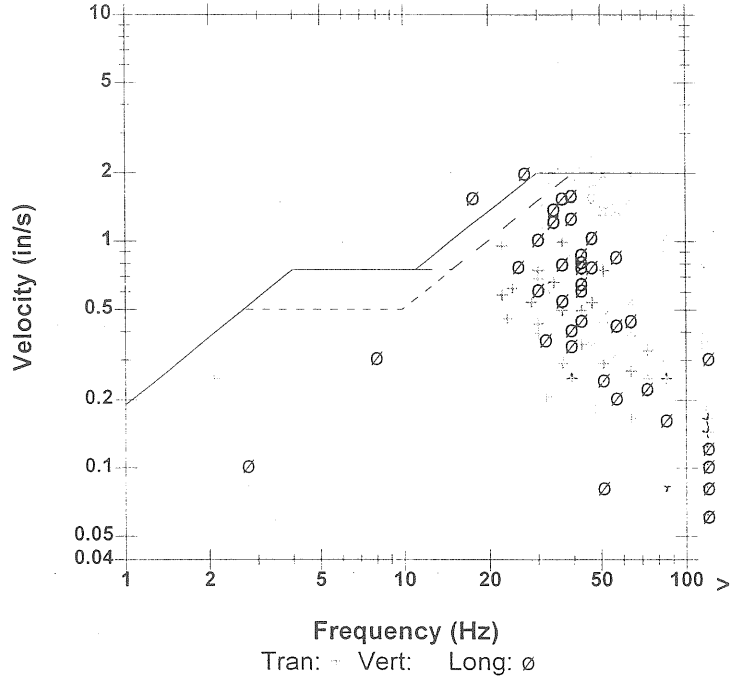
**Extended Notes**

ON THE QUARRY FLOOR NEXT TO BLAST  
 SHELTER/VARIABLE 200-500 FEET FROM SHOTS PEJ  
 01-32A, 32B, 33, 34A, & 34B UPPER, UPPER -2, 2.5, & 3  
 LEVELS/SEE NOTES FOR GRID LOCATIONS

**Post Event Notes**

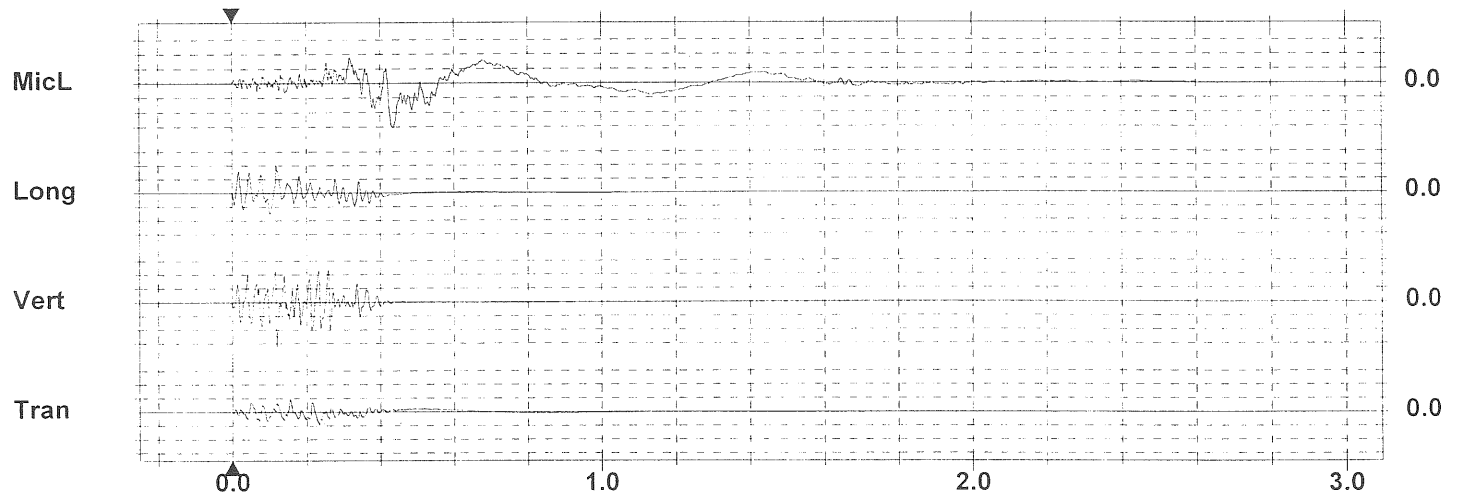
**Microphone** Linear Weighting  
**PSPL** 134.5 dB(L) at 0.437 sec  
**ZC Freq** 6.0 Hz  
**Channel Test** Passed (Freq = 20.0 Hz Amp = 466 mv)

**USBM RI8507 And OSMRE**



	Tran	Vert	Long	
PPV	0.960	3.24	1.96	in/s
ZC Freq	37	57	27	Hz
Time (Rel. to Trig)	0.157	0.121	0.120	sec
Peak Acceleration	1.06	5.73	1.70	g
Peak Displacement	0.0210	0.00821	0.0102	in
Sensorcheck	Passed	Passed	Passed	

**Peak Vector Sum** 3.83 in/s at 0.121 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 1.000 in/s/div Mic: 0.00500 psi(L)/div  
 Trigger =

# Event Report

Date/Time Long at 12:21:23 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo :10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 0541 V 5.51 BlastMate II/477  
 Battery Level 6.5 Volts  
 Calibration February 1, 2001 by Instantel Inc.  
 File Name B5418R5E.BN0

## Notes

Location: G.BATES-ROCKY HILL ESTATES  
 Client: Harry C. Crooker & Sons, Inc.  
 User Name: RICHARD GOWER  
 Converted: October 9, 2001 3:47:13 PM (V4.30)

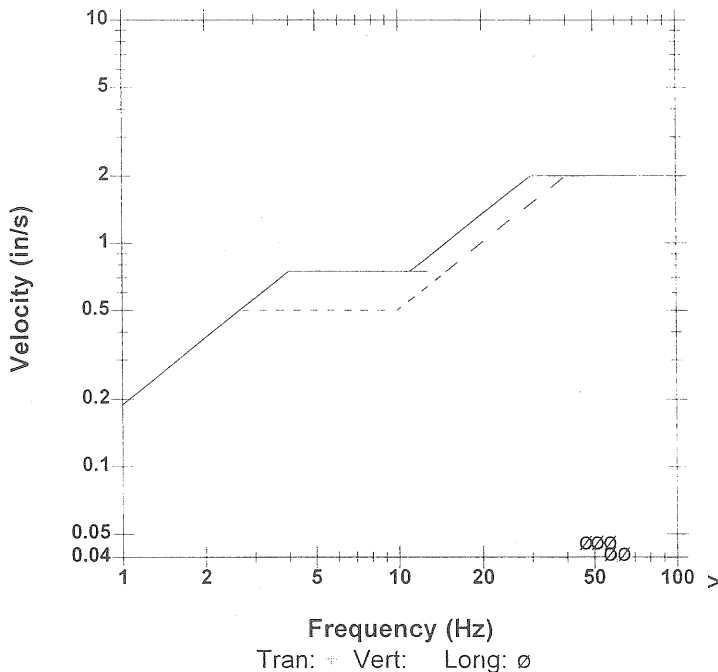
## Extended Notes

ON LAWN 12 FEET FROM CORNER OF GARAGE AND 212  
 0 FT  
 FROM SHOTS PEJ 01-33 ON THE UPPER-2 LEVEL  
 AT G RID BL -0+50 TO 0+00 AND L1825 TO  
 L1875

## Post Event Notes

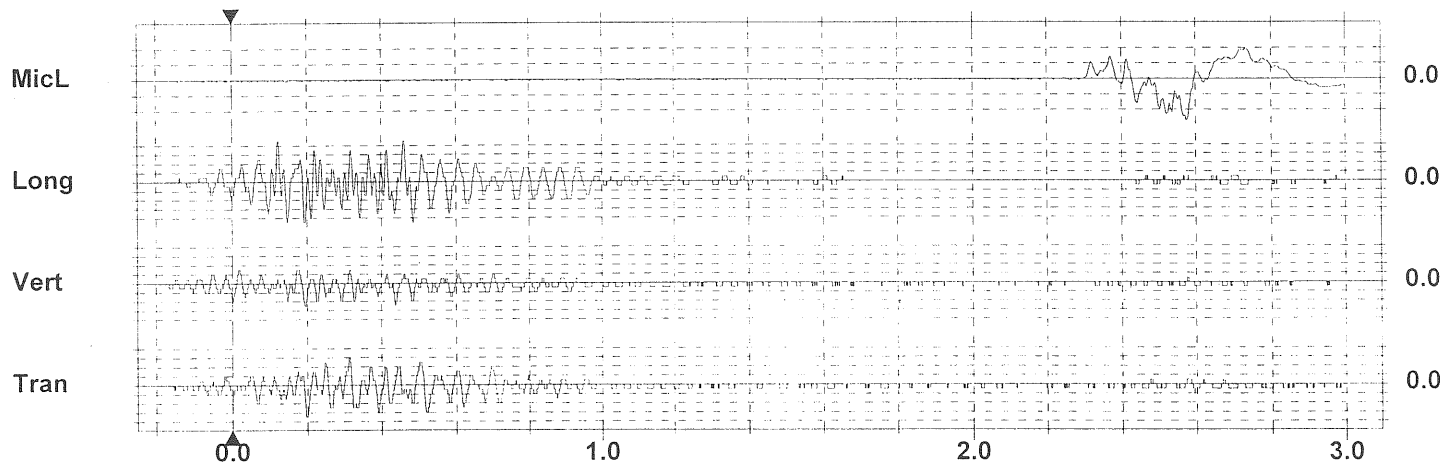
Microphone Linear Weighting  
 PSPL 119.3 dB(L) at 2.576 sec  
 ZC Freq 4.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 266 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0350	0.0250	0.0450	in/s
ZC Freq	34	37	43	Hz
Time (Rel. to Trig)	0.198	0.195	0.124	sec
Peak Acceleration	0.0265	0.0265	0.0398	g
Peak Displacement	0.00021	0.00010	0.00020	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.0575 in/s at 0.196 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.01000 in/s/div Mic: 0.00100 psi(L)/div  
 Trigger = ▶ — — — ◀



COVER LETTER SHOT PEJ 01-34  
10/09/01

**SHOTS 34** WAS LOCATED ON THE UPPER-2 LEVEL WITH DRILLING TO ELEVATION 145. MONITORING WAS DONE AT T. JUSTICE, R. FLAIG, G. BATES, AND THE QUARRY ENTRANCE ROAD. WATER LEVELS, CRACK MONITORS, AND SEISMOGRAPH DATA WERE ALL COLLECTED.

THIS SHOT WAS THE **THIRTIETH-THIRD** FOR THIS SEASON. THIS BEING THE **THIRD** FOR THE DAY WITH **THREE SHOTS** SCHEDULED.

**SHOT 34** WAS A PRODUCTION SHOT WITH TWO FREE FACES EACH. IN THIS AREA WE ARE NOT DECKING BETWEEN THE TOP AND BOTTOM. THIS WAS USING 350ms IN HOLE WITH 25ms SURFACE DELAYS. THIS WAS A NON-ELECTRIC SHOT.

IT FIRED AT **1:01 PM**. THE SHOT HAD GOOD MOVEMENT AND PRODUCED GOOD BREAKAGE. THE SHOT LOADED VERY WELL IN THE LEAST LOADING TIME. WEATHER CONDITIONS WERE MOSTLY CLEAR WITH **WINDS SOUTH AT 14 MPH**, WITH TEMPERATURES AT **53 DEGREES**.  
DICK MORGAN TIMED AND DELAYED THE SHOT.

FROM CROOKER : D.MORGAN, M.TRUSIANI, S.RILEY, L.RUONA, & D.THURLOW HELPED WITH THE SHOT.  
FROM GREEN MOUNTAIN: BILL MCGOLDRICK AND DAVE ADAMS

AS THE MONITORING DATA SHOWS WE STAYED WITH IN OUR LIMITS. WE RECORDED ALL DATA FOR OUR RECORDS THUS MAKING THEM AVAILABLE IF THE CODES OFFICE OR THE M.D.E.P. WANTS TO REVIEW THEM AT ANY TIME.

A GROUP FROM PORTLAND ALONG WITH DRAGON PRODUCTS WERE PRESENT TO WITNESS THE SHOTS.

THE TOPSHAM CODES OFFICER WAS NOT PRESENT.

RESPECTFULLY,  
RICHARD MORGAN  
AGGREGATE SUPERINTENDENT



# Event Report

Date/Time Long at 1:01:12 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo: 10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 1271 V 5.51 BlastMate III/477  
 Battery Level 6.4 Volts  
 Calibration February 7, 2001 by InstanTel Inc.  
 File Name C2718R5G.600

## Notes

Location: QUARRY ENTRANCE  
 Client: Harry C. Crooker & Sons, Inc.  
 User Name: JOE HANNA  
 Converted: October 9, 2001 3:47:20 PM (V4.30)

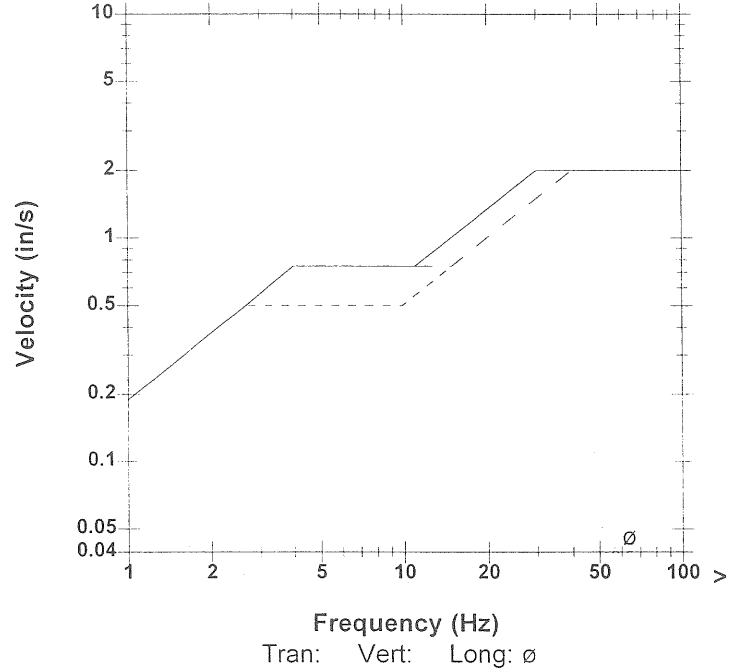
## Extended Notes

AT THE ENTRANCE TO WELL B-101 NEXT TO QUARRY ENTRANCE ROAD/1710 FT FROM SHOTS PEJ 01-34 ON THE UPPER-2 level at grid bl-6+75 to-4+25 and I925 to I1200

## Post Event Notes

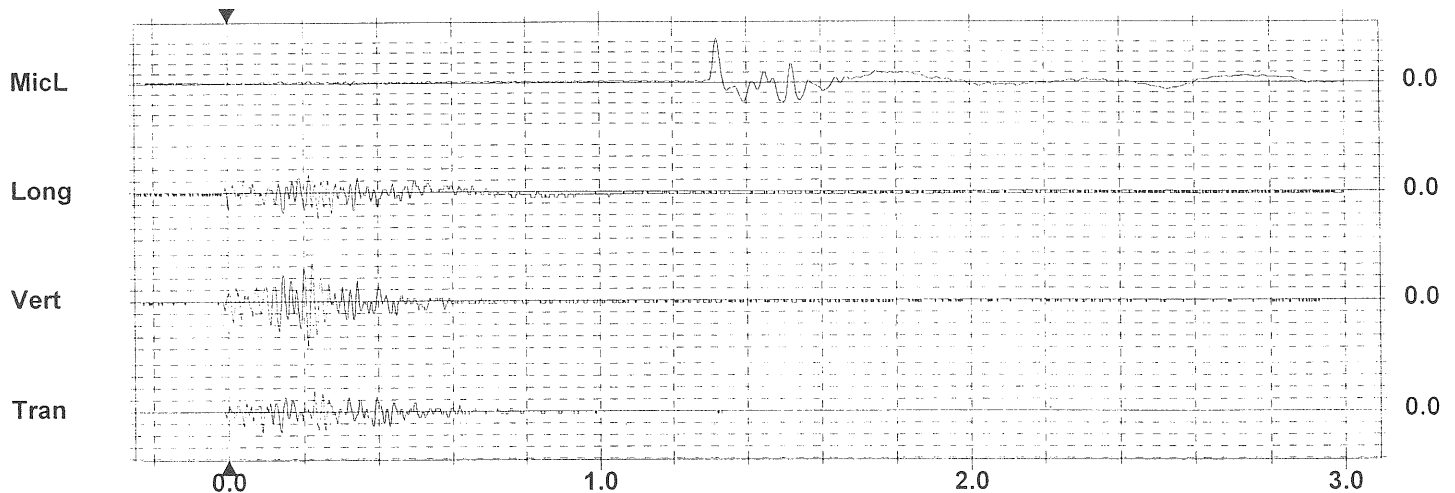
Microphone Linear Weighting  
 PSPL 123.5 dB(L) at 1.320 sec  
 ZC Freq 9.1 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 244 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0350	0.0750	0.0450	in/s
ZC Freq	57	47	51	Hz
Time (Rel. to Trig)	0.090	0.212	0.240	sec
Peak Acceleration	0.0398	0.0530	0.0398	g
Peak Displacement	0.00011	0.00028	0.00014	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.0788 in/s at 0.214 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div  
 Trigger =

# Event Report

Date/Time Vert at 1:01:10 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo :10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 1272 V 5.51 BlastMate II/477  
 Battery Level 6.3 Volts  
 Calibration January 30, 2001 by InstanTel Inc.  
 File Name C2728R5G.5Y0

## Notes

Location: ROGER FLAIG-OLD LEWISTON ROAD  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: MAURIC MORGAN  
 Converted: October 9, 2001 3:47:18 PM (V4.30)

## Extended Notes

20 FEET OFF S.W. CORNER OF HOUSE IN DRIVEWAY 16  
 10 FT  
 FROM SHOTS PEJ 01-34A & 34B ON THE UPPER & UPPE  
 R-2 LEVELS  
 AT GRID BL -6+75 TO -4+25 AND L925 TO L1200

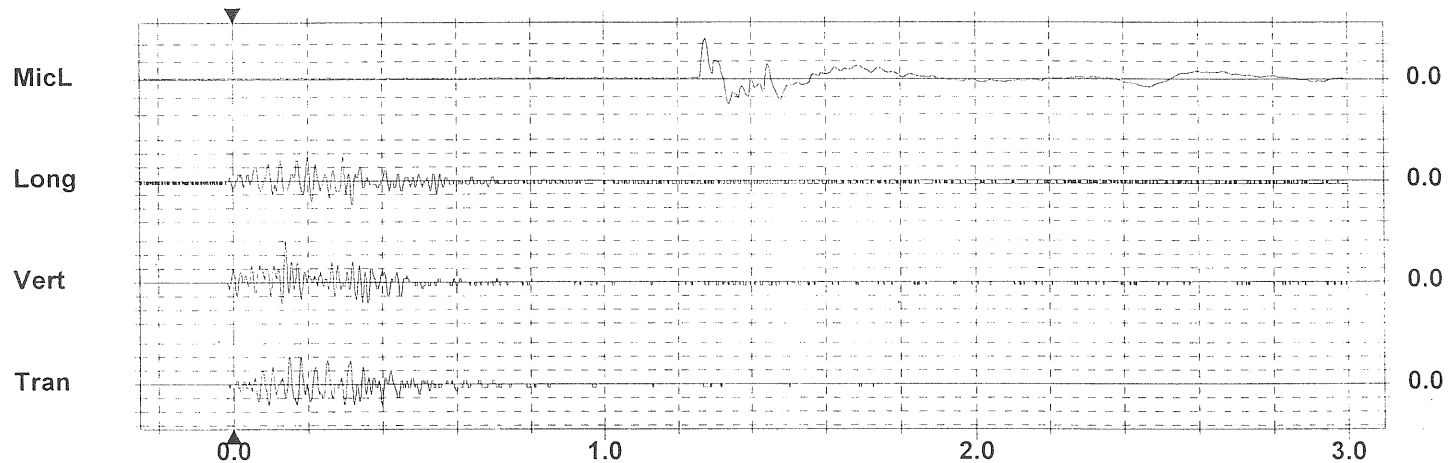
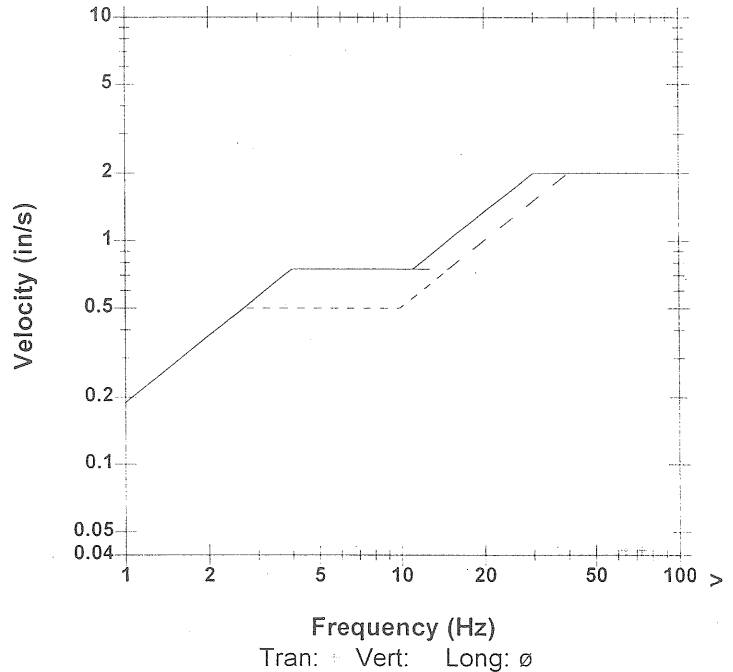
## Post Event Notes

Microphone Linear Weighting  
 PSPL 124.1 dB(L) at 1.276 sec  
 ZC Freq 5.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 269 mv)

	Tran	Vert	Long	
PPV	0.0400	0.0600	0.0350	in/s
ZC Freq	47	51	47	Hz
Time (Rel. to Trig)	0.150	0.141	0.200	sec
Peak Acceleration	0.0265	0.0398	0.0265	g
Peak Displacement	0.00016	0.00020	0.00011	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.0650 in/s at 0.141 sec

## USBM RI8507 And OSMRE



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.0200 in/s/div Mic: 0.00200 psi(L)/div  
 Trigger = ▶ --- ◀

# Event Report

Date/Time Long at 12:59:06 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo :10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 0891 V 5.51 BlastMate II/477  
 Battery Level 6.4 Volts  
 Calibration February 1, 2001 by InstanTel Inc.  
 File Name B8918R5G.210

## Notes

Location: ROGER FLAIG-OLD LEWISTON ROAD  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: MAURICE MORGAN  
 Converted: October 9, 2001 3:47:15 PM (V4.30)

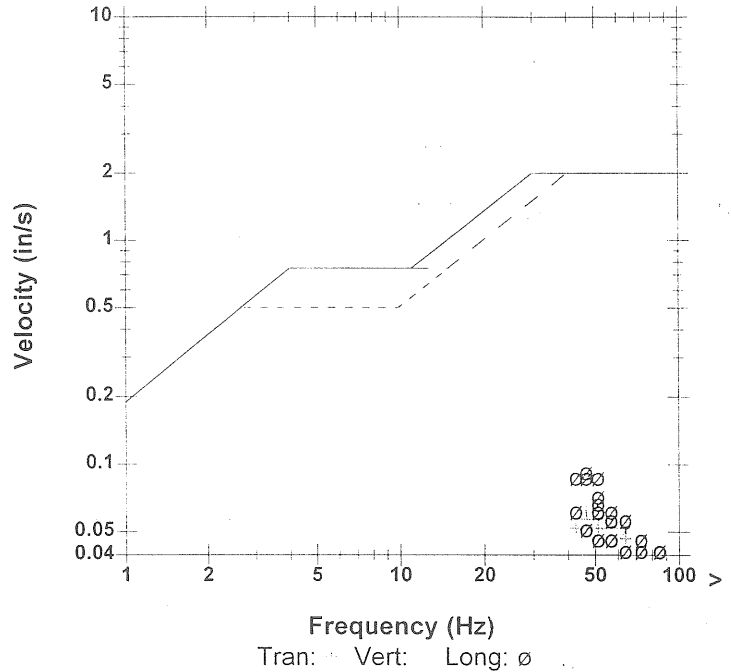
## Extended Notes

20 FEET OFF S.W. CORNER OF HOUSE IN DRIVEWAY 16  
 10 FT  
 FROM SHOTS PEJ 01-34A & 34B ON THE UPPER & UPPE  
 R-2 LEVELS AT GRID BL -6+75 TO -4+25 AND L925 TO L1  
 200

## Post Event Notes

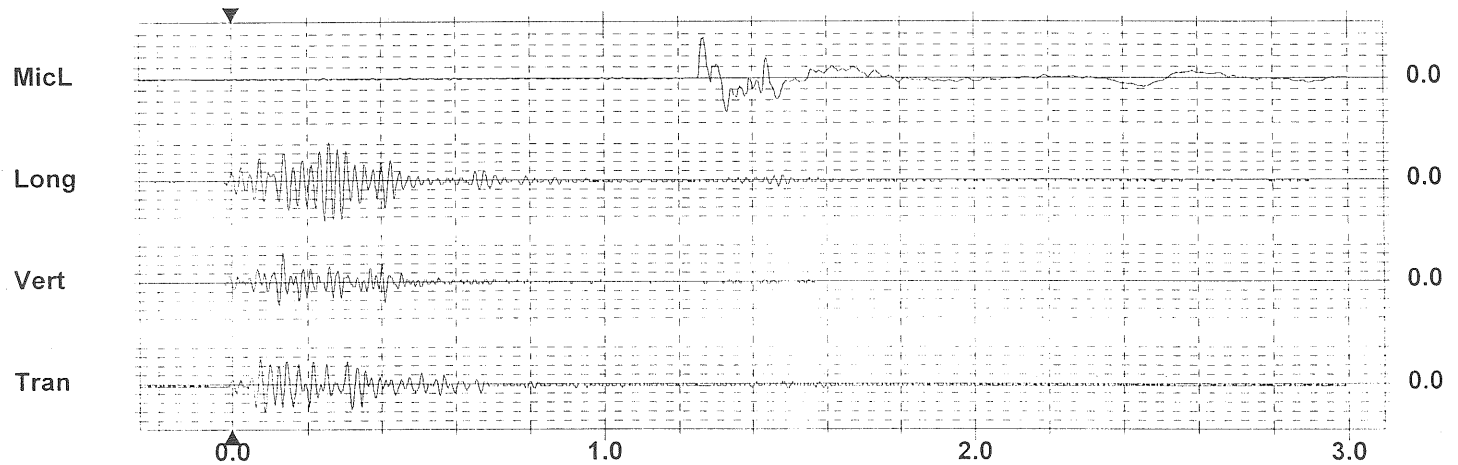
Microphone Linear Weighting  
 PSPL 122.1 dB(L) at 1.269 sec  
 ZC Freq 16 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 526 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0600	0.0650	0.0900	in/s
ZC Freq	39	47	39	Hz
Time (Rel. to Trig)	0.088	0.137	0.248	sec
Peak Acceleration	0.0398	0.0530	0.0663	g
Peak Displacement	0.00024	0.00023	0.00035	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.0931 in/s at 0.248 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.0200 in/s/div Mic: 0.00100 psi(L)/div  
 Trigger =

# Event Report

**Date/Time** Vert at 1:01:10 PM October 9, 2001  
**Trigger Source** Geo: 0.0200 in/s  
**Range** Geo :10.0 in/s  
**Record Time** 3.0 sec at 1024 sps

**Serial Number** 1756 V 5.51 BlastMate II/477  
**Battery Level** 6.5 Volts  
**Calibration** January 30, 2001 by Instancel Inc.  
**File Name** C7568R5G.5Y0

## Notes

**Location:** TIM JUSTICE-OLD LEWISTON ROAD  
**Client:** HARRY C. CROOKER & SONS, INC.  
**User Name:** DALE MORGAN  
**Converted:** October 9, 2001 3:47:19 PM (V4.30)

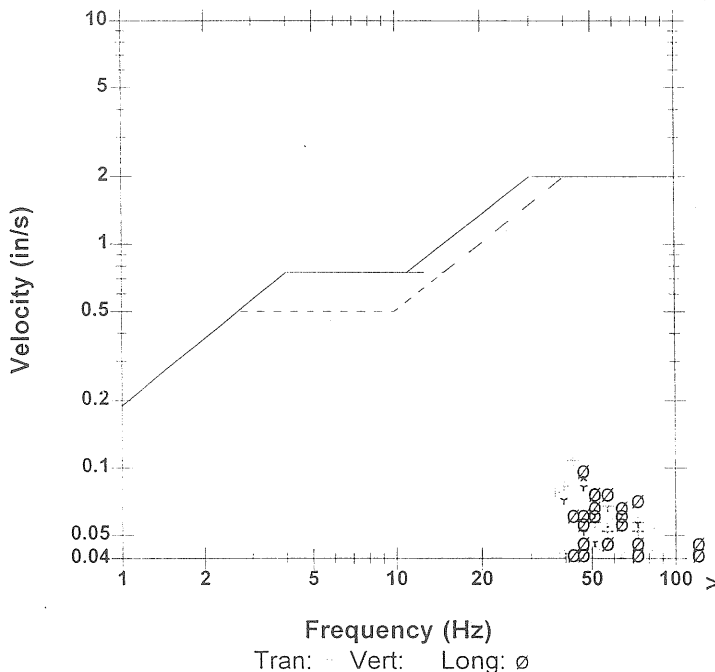
## Extended Notes

NEXT TO ACTIVE WELL IN FORK OF DRIVEWAY 1950 FE ET  
 FROM SHOTS PEJ 01-34A & 34B ON THE UPPER & UPPE R-2 LEVELS AT GRID BL -6+75 TO -4+25 AND L925 TO L1 200

## Post Event Notes

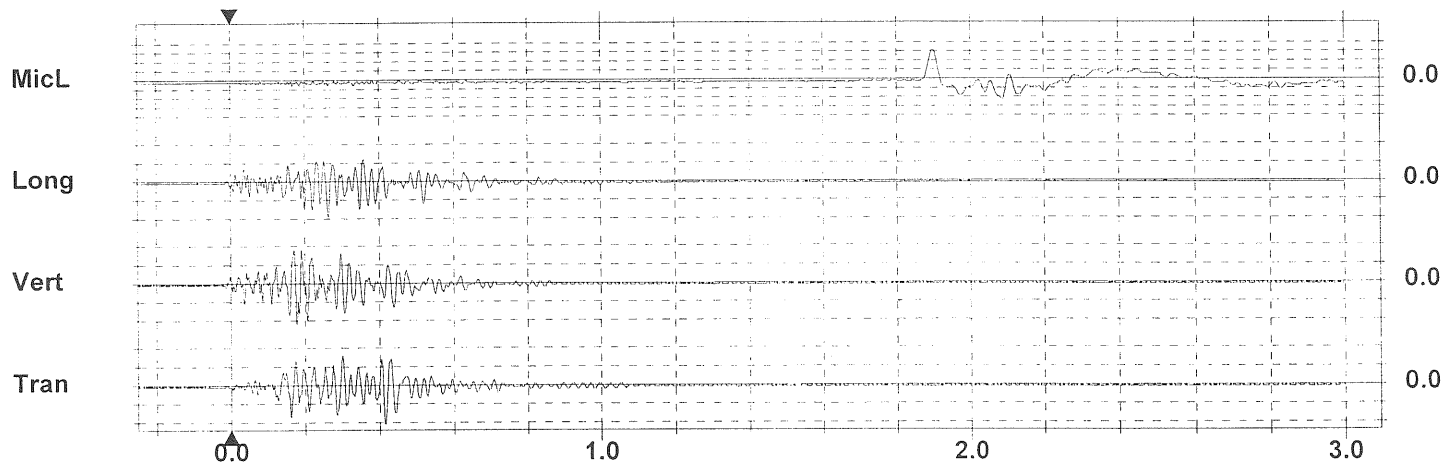
**Microphone** Linear Weighting  
**PSPL** 114.8 dB(L) at 1.898 sec  
**ZC Freq** 12 Hz  
**Channel Test** Passed (Freq = 20.0 Hz Amp = 265 mv)

USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.105	0.110	0.0950	in/s
ZC Freq	47	39	43	Hz
Time (Rel. to Trig)	0.415	0.180	0.266	sec
Peak Acceleration	0.0795	0.119	0.0795	g
Peak Displacement	0.00039	0.00044	0.00034	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.115 in/s at 0.208 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.0500 in/s/div Mic: 0.00050 psi(L)/div  
 Trigger = ▶ — — — ◀

# Event Report

Date/Time Vert at 1:01:05 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo :5.00 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 3988 V 2.6 MiniMate  
 Battery Level 6.4 Volts  
 Calibration January 31, 2001 by Instancel Inc.  
 File Name E9888R5G.5T0

## Notes

Location: IN THE QUARRY  
 Client: HARRY C. CROOKER & SONS, INC.  
 User Name: DICK MORGAN  
 Converted: October 9, 2001 3:47:17 PM (V4.30)

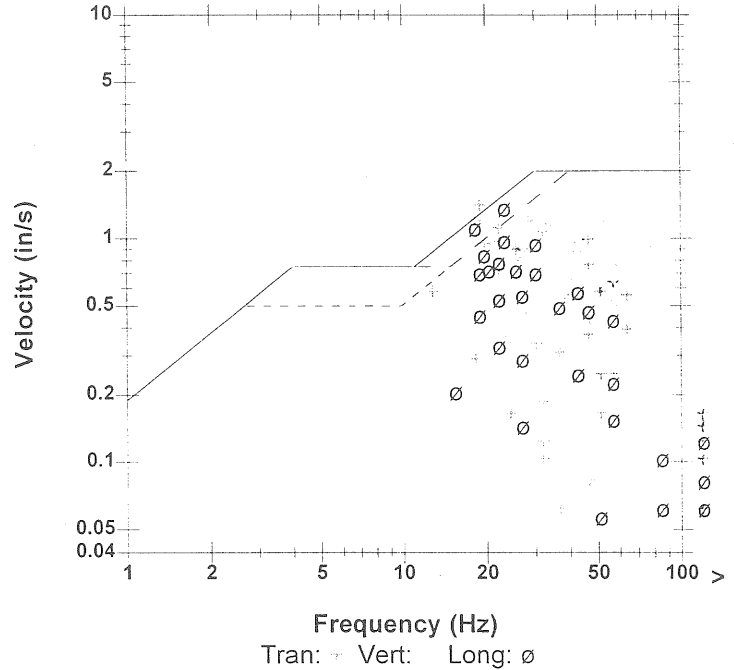
## Extended Notes

ON THE QUARRY FLOOR NEXT TO BLAST  
 SHELTER/VARIABLE 200-500 FEET FROM SHOTS PEJ  
 01-32A, 32B, 33, 34A, & 34B UPPER, UPPER -2, 2.5, & 3  
 LEVELS/SEE NOTES FOR GRID LOCATIONS

## Post Event Notes

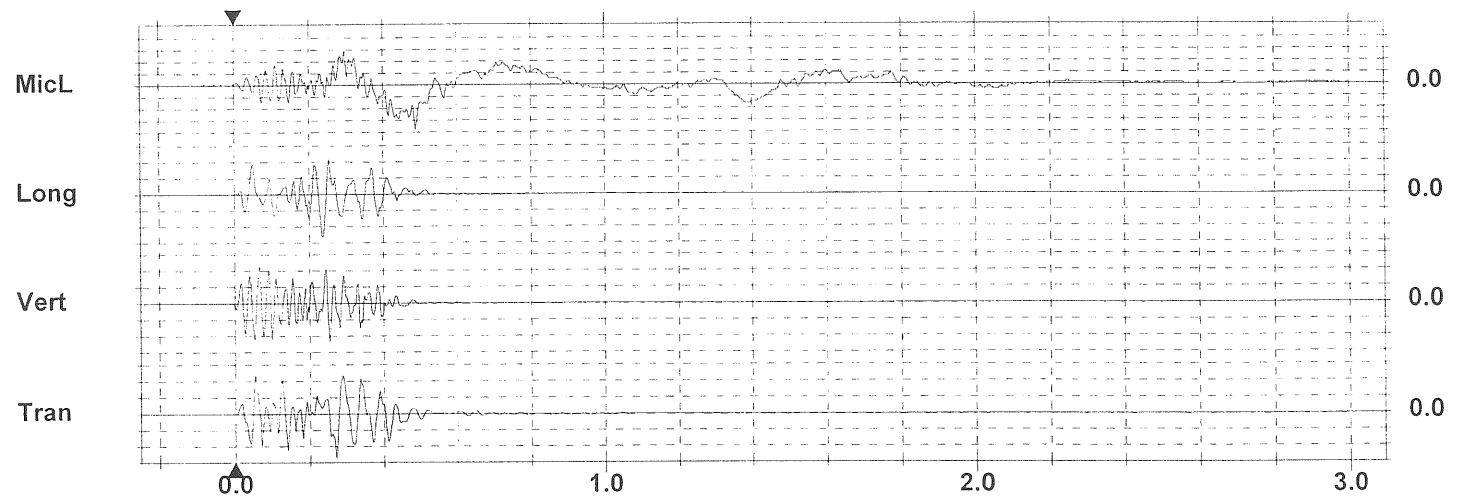
Microphone Linear Weighting  
 PSPL 128.3 dB(L) at 0.489 sec  
 ZC Freq 3.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 465 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	1.36	1.16	1.32	in/s
ZC Freq	19	43	23	Hz
Time (Rel. to Trig)	0.271	0.255	0.235	sec
Peak Acceleration	0.689	1.17	0.530	g
Peak Displacement	0.00962	0.00452	0.00856	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 1.74 in/s at 0.054 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.500 in/s/div Mic: 0.00200 psi(L)/div  
 Trigger =

# Event Report

Date/Time Long at 1:01:13 PM October 9, 2001  
 Trigger Source Geo: 0.0200 in/s  
 Range Geo: 10.0 in/s  
 Record Time 3.0 sec at 1024 sps

Serial Number 0541 V 5.51 BlastMate II/477  
 Battery Level 6.5 Volts  
 Calibration February 1, 2001 by InstanTel Inc.  
 File Name B5418R5G.610

## Notes

Location: G.BATES-ROCKY HILL ESTATES  
 Client: Harry C. Crooker & Sons, Inc.  
 User Name: RICHARD GOWER  
 Converted: October 9, 2001 3:47:22 PM (V4.30)

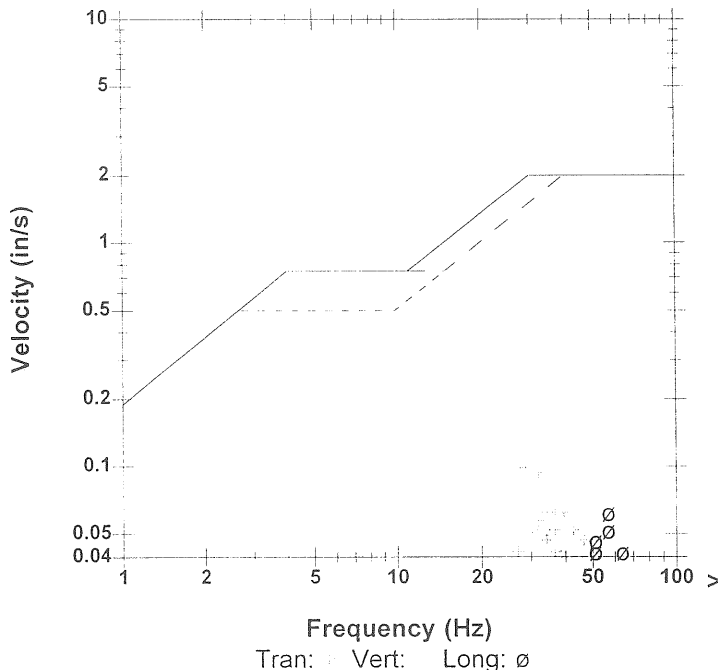
## Extended Notes

ON LAWN 12 FEET FROM CORNER OF GARAGE AND 190  
 0 FT  
 FROM SHOTS PEJ 01-34A & 34B ON THE UPPER & UPPE  
 R-2 LEVELS  
 AT GRID BL -6+75 TO -4+25 AND L925 TO  
 L1200

## Post Event Notes

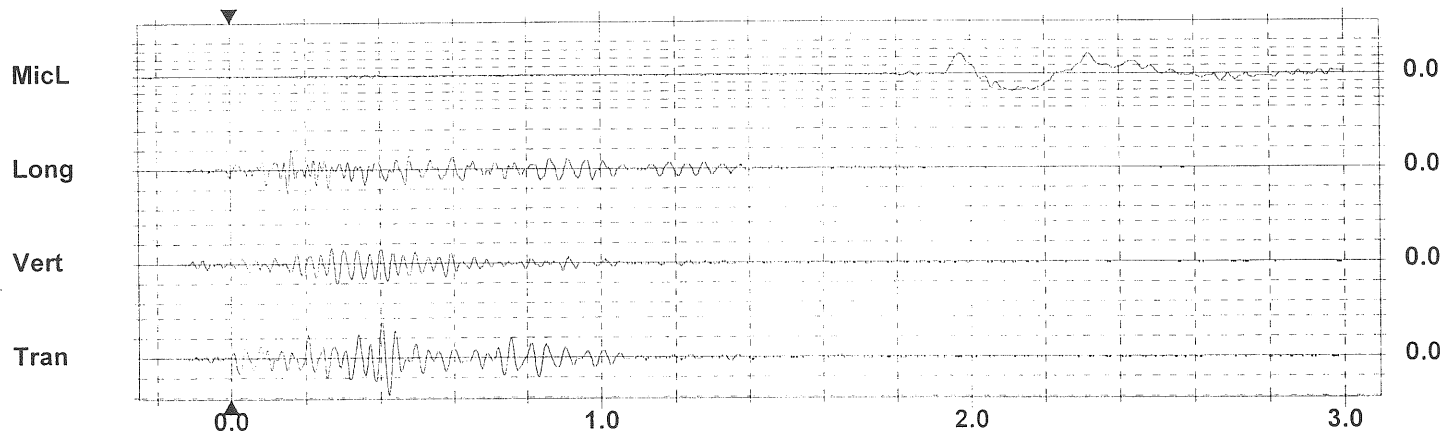
Microphone Linear Weighting  
 PSPL 112.6 dB(L) at 1.970 sec  
 ZC Freq 6.0 Hz  
 Channel Test Passed (Freq = 20.0 Hz Amp = 266 mv)

## USBM RI8507 And OSMRE



	Tran	Vert	Long	
PPV	0.0950	0.0500	0.0600	in/s
ZC Freq	27	32	47	Hz
Time (Rel. to Trig)	0.423	0.286	0.153	sec
Peak Acceleration	0.0530	0.0398	0.0398	g
Peak Displacement	0.00059	0.00029	0.00020	in
Sensorcheck	Passed	Passed	Passed	

Peak Vector Sum 0.104 in/s at 0.423 sec



Time Scale: 0.20 sec/div Amplitude Scale: Geo: 0.0500 in/s/div Mic: 0.00050 psi(L)/div  
 Trigger =



Dragon Meeting.

Stone	10	
S	800	
Cem	5,000	
Conc.	12,000	

47,000 trucks in/out  
 $\sqrt{37\%} = 21\%$

1980 - 1992 blasting stopped w/ run out esp. etc. (20-25/x yr.)

5-6 loads of conc. in house found.

1 yard = 1 ton stone  
 Con

cement made of limestone.

100,000<sup>cu.</sup> yards per year  $\approx$  need 100,000 tons stone

Stone sand cement + water

Dump truck long in truck = 20 ton.

10,000 truck trips/year. (5,000 loaded, 5,000 empty)

shelf life of 1 1/2 hours - off truck.

cement + sand are trucked in. cement trucks. 3,000 loads of sand.

4,000 sand trucks

Capacity

1980 45 - 50,000 yards out/year.

Dragon will be "liable" w/ 2000 ft.

Proposed piece - 2.1 million cubic yards of stone  
 $= 1.6$  million ton  $= 20$  years work.

Perkins - blasting has caused damage.

→ How is responsibility spelled out for corrective damage.  
 if there is damage, would they have to file suit.

How does Fire Dept fit in to blasting.

What happens. if 4,000 ft away there is damage.

Escrow Act to arbitrate damage claims? CN. Dragon has insurance.

Can language be drafted for people outside of 2000ft?

May need geologist to study soil/ledge.

They'll put a plan together showing 2000ft.  
Madd.

Damage of dust.

Call Thomaston - get letter from CEO

Annual review of blast events at a public mtg.

Dragon will consider paying for a peer review geologist to estimate impact.

Dust? How far does it move - Quantity?

Allowed to create dust w/ timeframe. They can remain undisturbed

July 12 - N'hood Mtg.

make sure "blasting" is worded



# Orlando's

- a. Blasting standards described in §490-Z (14), including preblast surveys as described in subsection (F), sound standards described in subsection (H), vibration standards described in subsections (I) - (K), and blasting records as described in subsection (L), including records of peak particle velocity and decibels for each blast.
- b. Dust standards described §490-Z (12)
- c. Reclamation standards described in §490-Z (13)

All blasting shall also be conducted in accordance with the Blasting Plan, Pre-blast Inspection Procedures, Drilling and Blasting Procedures Blasting Records standards shown on Attachment 7.

8. Complaint Protocol: DRAGON shall maintain the complaint resolution protocol and City reporting protocol described in Attachment 8. Furthermore, in the event of prolonged and chronic complaints of substantial noncompliance with the terms of this Agreement by DRAGON, the CITY may ask the MeDEP to review DRAGON's blasting operations for compliance with this Agreement. If DRAGON fails to implement any changes recommended by the MeDEP within a reasonable time period, then the CITY may hire third-party blasting engineers to conduct a 'peer review' of DRAGON's blasting operations and compliance with this Agreement, and the CITY's reasonable costs for such engineers shall be reimbursed by DRAGON.

*It is in light of peer review recommendations, Dragon fails to*

9. Reclamation of Site: Reclamation of the Property into a vegetated, useable condition shall be completed substantially in accordance with the reclamation plan described in Attachment 5 within 2 years of completion of the mining on the Property; provided, however, that such plan shall be subject to full review and approval by the Planning Board before being implemented.

*implement Planning*

*But Staff recommendations*

*they shall be deemed in breach of the contract and subject to the provisions of part 13*

Dragon N'hood Mtg 7/19/00  
• Sign up sheet?

1 ton stone <sup>per</sup> / 1 yard conc.

If contract is not approved, what can they do on site?

Any way to test in order to evaluate?

needs 5,000 trucks. of stone.  
will continue sand 4,000 trips

Cement. load

How loud ~~area~~ will blasts be? dB- DEP allows 120.

Annual meeting.

Rock crushing - decibel levels?

backing vehicles = noise

Mark Stebbins - Aug 1?

Does Marie Dilly? Blasting have a tape of a similar blast.

Noise of Drilling?

Decibel chart for P&J.

How often does DEP monitor?

Why did City allow homes to be built?

Truck traffic will not affect property values, blasting will.

Wants to know amount of explosives to be used. → Deborah Berry.

Mike Karum,

Game play. - Landfill. / Safety checks w/ landfill?



①

Lost tape - duplicate?

Is there an "intermediate" method for resolution?

- Piece of rock adjacent to dump.
- radon?

Escrow Azet?  
for damage

→ If there is damage, the contractors will use their insurance companies.

Kevin Gee.

→ Beef up language about responsibility ~~and~~ for damage.

N'hood wants a geophysicist to evaluate effect of blasting.  
(~~\$ for design~~)

Comparison between Blue Rock + trap m.

Minimizing advantage to Dryer.

\$5 - 7 / ton <sup>stone</sup> savings

Mrs. Brown - Ocean the run off.

Steve Schmidt - Cumulative damage? Studies Done?

→ City should force Dryer to clean up site regardless of contract.

Susan Yandell Noise - trucks - how loud?



→ Underground gas lines - what effect of blasting?

Cumulative Noise? Drilling, crushing, trucks, etc.

Site Location of Development Permit?

Track traffic ~ Presumptive vs. Ocean

~~It could have been a SIKONT only.~~

Drager.

Chris presentation.

1. Richard Perkins: <sup>794</sup> Ocean Me.  
photos, hearing impacts.  
multinational co.

residential use.

Ocean Me portage - should do it anyway  
net traffic will be increased.

2. Dan Cobb 784 Ocean Me.

residential shouldn't be rezoned to heavy use

4-10 neighbors will be damaged

pretty <sup>prelude here</sup> hostage - exposure should be improved

Not mutually exclusive

vibration standards frequency  
damage consultant.

residential - 4-12 hertz - drywall + plaster

plaster 26-10 hertz may suffer damage.

effect of repeated plashy.

1/2 ips. results in damage.

Ledge

low frequency.



Ed Adams - Greystone Lane.

Blasting is not a specific science.  
Damage in Phil. w/ blasting during construction  
Landfill darge, Radon.

Quality of life?

Tax issues not even enough.

\$125,000 year. taxes

= Not blasting - preparator - Drill

Inefficient trucks used. Caddisgar 30yd. dump  
Dragon should be houses of someone who <sup>sucks?</sup>  
wants to sell.

Alan Levinsky - Ocean Apts.  
all members against

Mike Yandell. Summer Place

Tax \$ contributed

speculative land purchase

Dragon - cannot offset effects of blasting.

US Bureau of Mines - % of complaints.

regard time value of scale for gov.

Comp Plan - not consistent.

Vision Statement.

Ruth Ross - Democrat.

# residents, taxes.

Suzanne Dargie - Charlotte Dr. Felmont A.

1438 residents, No notice.

Expansional non-conf use.

landfill, now

Ellen Vito - Question.

date of last blast?

Ocean Ave map should not be linked to Contract.

When weighing, it is overwhelmingly negative.

Pruders of Proof.

John Prudd - Falmouth.  
drilling.

Noise for drilling.

Kevin Gee - Ocean.

Drilling - nuisance

Vincent Delitto - drilling noise + dust

What was bands impression

Ethel Davito.

dust - crusher?

Margaret Brown

Mess along ☹

Doris Navadell Summer Place.

Laura Sornowski - Summer Place

plead warning blasts - Mahase.

Blast at different sizes.

David Staven, fuses.

Quality of life

Cauter Guarantee no damage.



Board.

Bad deal for n-hood.

will take much

offer n-hors off Ocean, wout benefit thm.

30 - A MRSA -  
AB.

Consistent // w/ Comp plan.

Comp plan -

Does not support ~~it~~

Amend comp plan. - citizen participation.

Consistent w/ existing, permitted uses.

Proposed R-3 zone.

Not allowed in any residential zone.

Dragon contract stated they were inconsistent.

Unprecedented. - Not Residential  $\rightarrow$  industrial.

Probability issue.

probability  $\downarrow$

.25

Dragon has not committed to

risk associated w/ blast of varying frequencies


less than .2% damage.

Classification - Perkins.

Utter - shuffled bean

Last blast - 1993.

drilling, firing

ICPAC notes. Policy Statement,  
Memo. 

Appropriate Notice, Falmouth Town Office.  
adequate notice.

No limits on drilling hours.

Dust -  
Flying Rock

drilling 9-5 weekdays

4-1 amendment re drilling # 6.

Dragon 8/3/01

peak particle velocity, - annoyance factor.

its "mitigable compromise." little bio data is

ability to review on an annual basis will  
allow for "mutual" degradation, or  
nature of complaints. structural damage.

Annual review by EPA.

Dragon concerned that an annual review,  
which may require a check for ppv.

How to monitor {  
Seismicity  
Ocean Ridges  
Landfill

Revisions.

3 year reviews? Cycles?

Preblast Survey.

Qualifications -

Other vibrations / how many?

75 target

14-269 - diminution

- odor - dynamite.
- + 20 am horn blast.
- dust.

30 years?

Rock crusher dust? How to take care of.  
4:00am noise ....

☐ Damage.....

Williams - Ocean Ave 1040?  
House on ledge.....

☐ Mathematical Analysis of blast pattern.



Dragon Workshop. 4/23/01.

get the research - Mining Report - for background.

ppv. attenuation - equations to predict the attenuation.

Examples of air blast decible correlation?

more correlation between air blast db + ppv.

→ Timeline = <sup>Orlando</sup> previous blasting periods of non use, continuous use.

→ Mark - reclamation standards? DEP ok?

Mrs Brown - truck trips - incorrect.

Nearest guideline - Willstone:  $PPV \Rightarrow .02$  - comfort level

→ Maps showing 1/4 inch scale ppv.

→ Dredging - video/sketches - we need more specifics - See Mark  
Call list CRITERIA

→ Need info on noise mitigation - VEGETATION - Mark?  
Muffers? DEP?

→ Blasting experience - Complaints from distances. → How many complaints at how far a distance?

~~DEP~~ Would blasting affect motion detectors

DEP: Dust Noise? Traffic.

...Air Blast.

- o damage within 7,000 ft? Depends on Air Blast strength
  - black brook subdivision in Gorham.
  - drilling + mining → noise vibration levels.
  - Notification - how to notify Falmouth residents? Call Falmouth Town Hall
  - Land fill - cap: inspections / radon.
- Aiming blast toward Falmouth, noise  
Property values?

Prop DEP Standards

95% prob. of no cos. damage. for each individual blast

5% 20x/yr over 20 years

→ likely/probable that damage will occur.

1 blast/week.

trees - will they buffer noise/vibration

Blasting for a warehouse

Go further than 2000 ft for pre blast

## Successful Blast - Mitch - Green Mountain

- homework - creates blast plan  
monitoring
- adherence to safety + preblast depts.
- record keeping
- measurement of results to standards
- safety over performance
- respect for homeowners

## Pre Blast Survey. - Joe Naine Dully + Blasty

- mail notice - 3-4 days  
call back to set date
- 3 attempts.
- video, photos.
- call list - n'bers - 1-2 hours.

Need info on noise mitigation. Mark Stebbins  
air blast "

WSDOT standard for 2 m/sec.

Noise level of drilling/mining



Ann Thayer Dust equipment, roads,  
DEP standards opacity  
covers dust from blast?

fugitive dust plans.

→ Need more info on dust at blast

Noisance Dust Standard?

→ Property Value Impact?

crushing plant 9-4? ← in contract

Reduction in truck traffic - include in contract.



Give to Perry JW  
• issues chart

Does Meule have  
Summer Place plans?

Dragon - 2/21/01.

Blasting will  
affect curing  
concrete

Mark Peterson

Site visit, mts w/ Dave Grinnell. Landfill Visit, City Engineer  
Landfill info. Adjacent properties

Conclusions - project is in conformance w/  
gov't engineering practices

Determine a way to meet all needs, ability  
to meet concerns.

Balance between  $\Phi$  and regulatory criteria.

Criteria

1. How to convey mitigation measures to public?

Human response factor vs. damage.

DEP Standards  $\rightarrow$  damage w/ vibration, etc.

those criteria are based on houses on firm  
foundations.

How much fill was placed, what type of fill?

Human Response

A quarry is obtrusive; people will feel vibrations

• 5 inches vibration tolerable to 95% of people  
outside.

People in homes  $\rightarrow$  30% discomfort.

Where do we want to set regulation?

At discomfort level or at damage level?

Has not connected yet w/ DET: John Stebbins / John Hoppe.

Some inconsistency between tables of blasting vibration.

1. Allowable Vibration Criteria / sensitivity to human response

2. Loose Fill Situations

These standards may not be suitable for homes on suspect foundations.

Preblast survey → identify sensitive areas

Any sensitive Structures - ~~Are~~ Are there doctors offices / other sensitive means, equip

3. Pre Blast Survey, Who, where, who pays, who gets copies

range in depth of investigation, set parameters.

→ 2000 ft range, <sup>not obliterated</sup> 750 ft, exemption if charges meet <sup>weight</sup> scale distance factor of 70.

Scale distance - is related to vibration

Value of 70 is conservative (.2 - .3 inches/sec) <sup>Vib.</sup>

Assessment of vibration attenuation w/ distance.

There may be other site specific considerations

Soil types, water table, etc.

3 copies of video

How many homes would be subjected to survey?  
Who, where, how many?

→ How acceptable is DEP criteria to this site.

Dave - 10-20 blasts/year

Find criteria/regulation

less restrictive than City, more than DEP.

1. pre blast - map
2. no exceptions - charge weight.
3. specifics of blast/vibration

Is objective purely structural?

if so, DEP would cover it.

We need more comfort level.

Put it in writing, to Dave Gravel!

- BLAST DESIGN: assumed wt. per charge, calc. scale distance  
DEP says - if greater than 70 - no monitoring
- MONITORING REQUIREMENTS - where?  
measuring noise, ground vibration, air blast

Need long term blasting plan,  
where will it start, layout of work  
how will excavation take place?

What is plan?

Specifics, detail.

EX: May make sense to blast to west first (away from  
to set up a back record from monitoring SP.)

3D may make effects feel less than expected

### Traditional Test Blasts:

to help establish criteria for excavation  
prior to

Air blast is ground vibration.

Air may move but it feels like ground vibration  
" may cause minor damage.

### Noise

Study measured one drill rig.

What about noise of moving rocks to crusher.

→ front end loader.

They have agreed to meet IL limits (60dB)

NEED TO  
DETERMINE  
NOISE LEVEL  
(ACCEPTABLE)

⇒ 135 dB / blast event. What noise standards will apply?

### Dust

Do we need specific restraints to limit dust.

What is expectation of dust during blast.

Dust over properties nearby is possible. Dragon  
will research methods.

What can they do? Housecleaning?  
Time of day is critical... ambient conditions - wind, etc.

Will need to know how it will be dealt with.

## Adjacent Environmental Issues.

4.8  $\mu\text{sec}$  Jacques W. calculation.

Should be some post closure monitoring  
of landfill

Have a baseline of <sup>groundwater</sup> water quality at  
landfill, gas, gas migration.

Methane may escape. Should be part of record.

Radon - test as part of preblast survey.

Will blasting affect the stability of cap?

Need a documentation of landfill status prior to  
blasting - topography, leaching?

Wells? There may be some in Falmouth -  
documentation. Quantify existing conditions  
depth, yield

⇒ effect of blasting on steep/waterfront slopes,  
document condition before blasting.

⇒ Blast monitoring  
where, when, who gets reports, etc.

↓ As important during operation as pre blast  
is before operation.

## Chris

- ① Issues chart - need feedback
- ② redraft of contract - need feedback.
  - liability
  - claims process.
  - need to set up criteria
  - complaint protocol.
  - appeal process?
- ③ annual review by City
  - need a process.
  - annual meeting - hearing.

Judicial Review? check up.

Dragon has to consider higher standard for standards.  
after Mark falls to DEP, to compare  
standards.

May need to know other planning standards.

We will identify issues.

2.17.98

Boiler Plate language.  
Italics - use in. ⇒ China

Limit Blast to 20/year.

Limit months - March - Nov  
7am - 4pm hours of op.

Rock crusher - site plan - rear of site  
enclosed

Specs. - noise/dust

Relocate conveyor belt to rear.

Change location of stockpiled stones.

[Maybe - route trucks onto Presumps - at  
Except for Deliveries off route, ] ←

13.3

1 minute.  
apart.



1H zone - All stds would apply

Add mining/extraction as a permitted use

Manufacture of concrete won't change, just mining.  
Concrete plants including mining of stone onsite.

Adopt new stds

Vibrations

DEP 1996 Quarry stds  
noise, blasting, etc.  
pre blast survey etc.

} incorporate as part of  
contract.

Sat am. Avg dbl reading 66.

Mon am w/ plant : 76

Truck traffic - cement trucks from Thosastor  
trucks taking away concrete  
bring in stone from other facilities  
13-26 truckloads of stone each day.  
if they mine stone, no more  
truck trips

Hours of Operation

May 26 @ 3:00 at site.

4/28/98 Wkshp - Dragon.

Dragon owns bridge at Pres/Ocean.

blue-crosshatch - 9 acres

last blast 1992.

- site plan - minimizes impact on n'hood.  
⇒ building, fencing, sidewalks

rock crusher, conveyor belt reloc.  
from, times, months of blasting  
noisy mchs.

⇒ Access, driveways  
- Treat as a new site plan.  
- Make clear the benefit.

DER - Blasting next to an existing landfill

Dragon. 12/22

1. Is there a method of meeting our standards.
2. Reclamation Plan.  
What is acceptable? Vertical rock face OK?  
Safety issues } or } "catastrophic tumbling" AQS.
3. Ocean Ave plan. depth? Soft behind garage.  $\uparrow$  to R.  
edge of quarry<sup>new</sup>.
4. Call Jaimcy
5. Volume, width, length, depth of quarry
6. Create envelope with dimensions for production area.
7. Send Chris memo from PW.
8. Stormline needs to be installed? PW. Underdrain?
9. Call a 2nd opinion (Weinschenk's) to review vibrator.  
1 ph, commentary, review of JW  
letter.

**From:** "Muhammad El-Taha" <eltaha@usm.maine.edu>  
**To:** Portland.gwgwia("blkjla@aol.com")  
**Date:** Mon, Apr 16, 2001 9:50 AM  
**Subject:** Re: Question Regarding Probability

Your figures, based on 400 and 600 blasts, are quite accurate. They however, represent the "expected number of blasts that will cause damage to the soundings". However, if your concern whether will be damage at all the picture is more gloomy. At 600 blasts the chances that none will result in damage is less than one in 10 trillion. At 400 blasts the chances that non will result in damage is less than one in 100 million. You are almost certain that there will be damage during 400-600 blasts.

The extent of the damage is already computed by you correctly. That is it is expected to happen on 20 occasions for 400, and 30 occasions for 600 blasts. The cost depends on what will be damaged.

Note : My numbers (and yours) are based on the data and problem description you provided and on the assumption of independence which means if one blast causes damage that does not affect whether a future blast will/will not cause damage. Because the damage can be cumulative (not independent), these figures are quite conservative which means if the 5% figure is accurate the situation could be much worse than the figures indicate.

Good Luck,  
Muhammad

On 15 Apr 2001, at 16:35, BLKJLA@aol.com <BLKJLA@aol.com> wrote:

> Dear Dr. El-Taha,  
>  
> My name is Brad Kauffman and I live at 776 Ocean Avenue in  
> Portland, just down the street from the Dragon Concrete Plant. I need  
> an expert opinion regarding the probable outcome of a proposal that  
> Dragon has before the Portland Planning Board and I was hoping that  
> you might be able to help.  
>  
> Dragon has proposed that it be allowed to resume blasting at its Ocean  
> Avenue site. In exchange, Dragon has offered to move the plant 300  
> feet from the road, landscape the frontage along Ocean Avenue, and  
> reduce truck traffic to and from the site.  
>  
> The neighborhood is, of course, concerned about the potential impact  
> on our homes from the blasting. The blasting experts have told us  
> that the blasting is "safe" in the sense that there is only a 5%  
> chance that a blast might cause damage to surrounding homes.  
>  
> The proposal, however, is not for a single blast but for 20 blasts a  
> year for 20 to 30 years, or a total of 400 to 600 blasts. Drawing on  
> what little I remember from college statistics, and assuming the  
> accuracy of the 5% probability provided by the experts, I come to the  
> following conclusions regarding the risk associated with the series of

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> \* At a total of 400 blasts, we should expect damage on 20 separate  
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> Thank you for taking the time to consider my request.  
>  
> Sincerely,  
>  
> Brad Kauffman  
> 776 Ocean Avenue  
> Portland, ME 04103  
> (207) 773-5286

-----  
Muhammad El-Taha, Professor, Chair and  
Graduate Program Director  
Department of Mathematics and Statistics  
University of Southern Maine

Email: [eltaha@usm.maine.edu](mailto:eltaha@usm.maine.edu)  
<http://www.usm.maine.edu/~eltaha>  
Phone: (207)780-4564  
FAX: (207)780-5607

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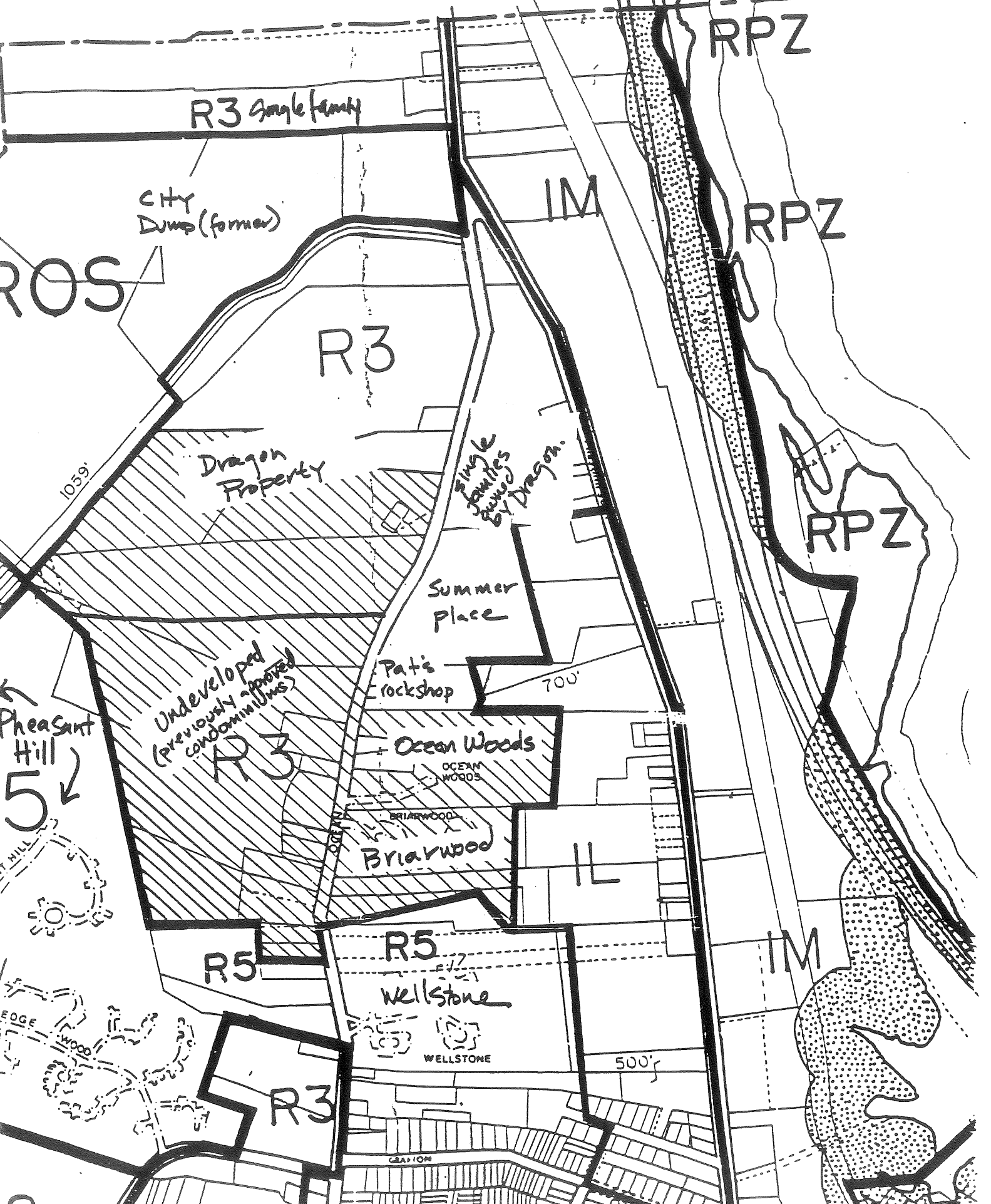
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Muhammad El-Taha, Professor, Chair and  
Graduate Program Director  
Department of Mathematics and Statistics  
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Email: [eltaha@usm.maine.edu](mailto:eltaha@usm.maine.edu)  
<http://www.usm.maine.edu/~eltaha>  
Phone: (207)780-4564  
FAX: (207)780-5607





R3 Gangle family

CHY Dump (former)

ROS

R3

Dragon Property

Single families owned by Dragon.

Summer Place

Pat's rockshop

700'

Undeveloped (previously zoned condominiums)

R3

Ocean Woods

OCEAN WOODS

Briarwood

R5

Wellstone

WELLSTONE

500'

R3

RPZ

RPZ

RPZ

IM

IL

IM

Pheasant Hill

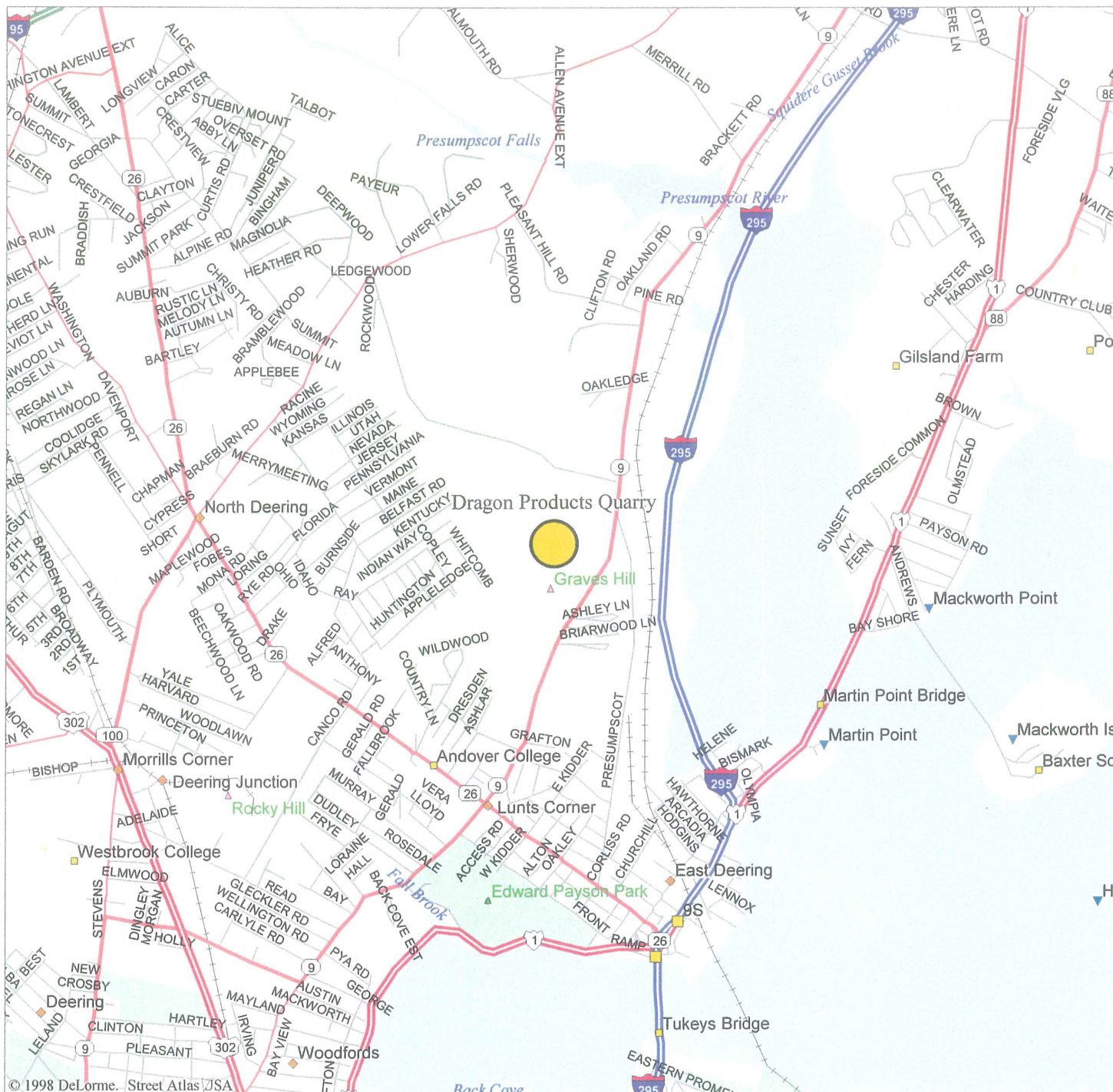
5

EDGE

WOOD

CRAYON



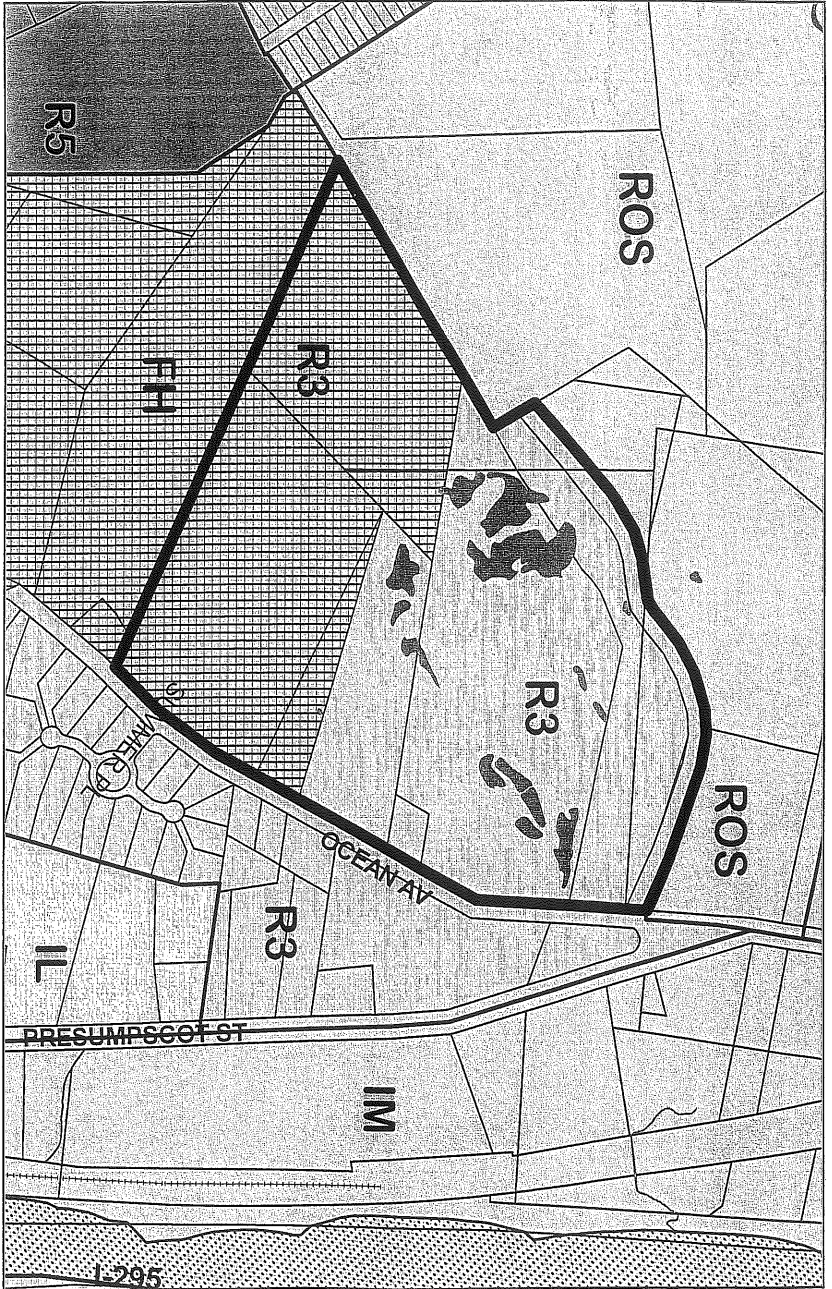


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Mag 14.00  
 Mon Nov 20 15:42 2000  
 Scale 1:31,250 (at center)  
 2000 Feet  
 1000 Meters

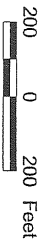
- |                           |                    |
|---------------------------|--------------------|
| Local Road                | Railroad           |
| Major Connector           | Point of Interest  |
| State Route               | Summit             |
| Interstate/Limited Access | Geographic Feature |
| Toll Highway              | Park/Reservation   |
| US Highway                | Locale             |
| Exit                      | Cemetery           |

## Dragon Products Company Quarry, Portland, ME



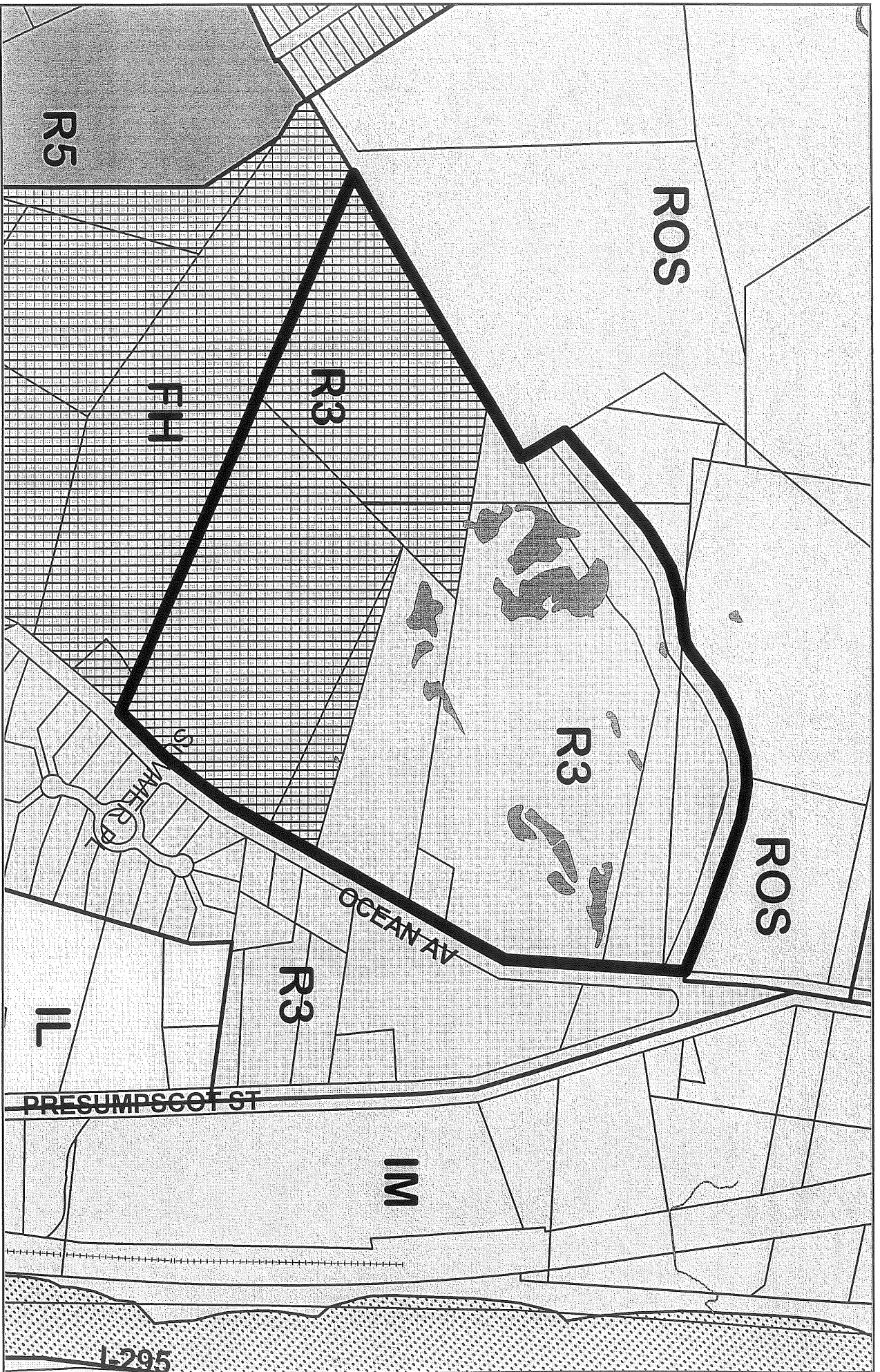
**PROPOSED DRAGON CONTRACT ZONE**

 **Proposed Contract Zone**



Map produced by the City of Portland's Department of Planning & Urban Development & the GIS Workgroup October 2001





# PROPOSED DRAGON CONTRACT ZONE



**Proposed Contract Zone**

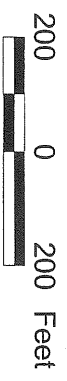




TABLE 8-2 Suggested Field Inspection Report

FIELD INSPECTION REPORT

BY \_\_\_\_\_  
(Type in name)

House Number and Street \_\_\_\_\_

Present During Inspection  
(yes) \_\_\_\_\_ (no) \_\_\_\_\_

Name of Occupant \_\_\_\_\_

Full name \_\_\_\_\_

I. DESCRIPTION OF HOUSE

Floors, one \_\_\_\_\_ or two \_\_\_\_\_  
Basement, full \_\_\_\_\_ or partial \_\_\_\_\_  
Number of rooms, up \_\_\_\_\_, down \_\_\_\_\_  
Type of construction, frame \_\_\_\_\_, brick \_\_\_\_\_,  
brick veneer \_\_\_\_\_, concrete block \_\_\_\_\_,  
stone veneer \_\_\_\_\_, shingle \_\_\_\_\_, stucco \_\_\_\_\_  
If brick, type of lintels, \_\_\_\_\_  
Roof, wood shingle \_\_\_\_\_, composition \_\_\_\_\_, or  
clay tile \_\_\_\_\_  
Chimney construction and type, \_\_\_\_\_  
Age of house, \_\_\_\_\_, condition \_\_\_\_\_, paint \_\_\_\_\_  
Any addition to house? \_\_\_\_\_ If so, is it same as original construction?

II. SKETCH OF FLOOR PLANS WITH IDENTIFYING ROOM NUMBERS

III. DESCRIPTION OF FOUNDATION AND BASEMENT

Excavated depth \_\_\_\_\_ or above ground \_\_\_\_\_  
Footings, concrete \_\_\_\_\_, block \_\_\_\_\_, brick \_\_\_\_\_  
Width of footings \_\_\_\_\_, proportional to loads \_\_\_\_\_  
Walls, concrete \_\_\_\_\_, concrete blocks \_\_\_\_\_, or \_\_\_\_\_  
brick \_\_\_\_\_, thickness \_\_\_\_\_  
Are the four corners level? Measure \_\_\_\_\_  
Is the first brick course level? \_\_\_\_\_  
Floor Joists  
Are both ends on masonry \_\_\_\_\_ or wood? \_\_\_\_\_ Size \_\_\_\_\_  
Length \_\_\_\_\_ Distance between floor joists \_\_\_\_\_ Size \_\_\_\_\_  
Are there double joists under unsupported partitions? \_\_\_\_\_  
Span and type of midspan support for joists \_\_\_\_\_

e  
g  
d  
←

or

IV. DESCRIPTION OF LOT

Level \_\_\_\_\_, sloping to front \_\_\_\_\_  
 to rear \_\_\_\_\_, or to side \_\_\_\_\_  
 Graded \_\_\_\_\_, or filled \_\_\_\_\_ area  
 Is area properly drained? \_\_\_\_\_  
 Provisions for handling water from roof? \_\_\_\_\_  
 Is subsoil drainage carried away from wall? \_\_\_\_\_  
 Are there large trees nearby? \_\_\_\_\_  
 Depth of water table \_\_\_\_\_  
 Any settlement of nearby structures? \_\_\_\_\_  
 COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

V. DESCRIPTION OF ROOM NUMBER \_\_\_\_\_ (reference drawing on sheet one)

Ceiling, plaster \_\_\_\_\_, wood lath \_\_\_\_\_, metal lath \_\_\_\_\_,  
 gypsum board \_\_\_\_\_  
 Walls, plaster \_\_\_\_\_, plaster and lath \_\_\_\_\_, or gypsum board \_\_\_\_\_  
 paper \_\_\_\_\_, paint \_\_\_\_\_  
 Ceiling: cracks? (Yes) \_\_\_\_\_ (No) \_\_\_\_\_  
 Location and size; state whether horizontal (H), vertical (V), slanting (S)  
 \_\_\_\_\_

Estimate age of cracks \_\_\_\_\_  
 Walls: cracks? (Yes) \_\_\_\_\_ (No) \_\_\_\_\_  
 Location and size; state whether horizontal (H), vertical (V), slanting (S):  
 where partition wall joins exterior wall \_\_\_\_\_

North	South	East	West
-------	-------	------	------

Corners of \_\_\_\_\_ windows

Corners of \_\_\_\_\_ doors

Others, i.e., \_\_\_\_\_ windows

Estimate age of cracks \_\_\_\_\_



PROPOSED DRAGON INDUSTRIAL ZONE

100' WIDE WOODED BUFFER STRIP

EXISTING QUARRY

PROPOSED EXPANSION

PROPOSED DRAGON INDUSTRIAL ZONE

200' WIDE EXISTING WOODED BUFFER STRIP TO REMAIN (NO CHANGE FROM R-1 ZONING)

SUBDIVISION

1962 (2717-446)

1932 (1409-483)

1937 (1516-475)

1962 (2717-446)

1985 (6995-251)

LEGEND  
CONTOUR LINES (10' INTERVALS) FOR 100' ELEVATION

NOTE:  
1. THIS MAP IS A PRELIMINARY MAP AND IS NOT TO BE USED FOR ANY PURPOSES OTHER THAN AS SHOWN.  
2. ALL RIGHTS RESERVED BY THE ENGINEER.  
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SCALE IN FEET  
0 100 200

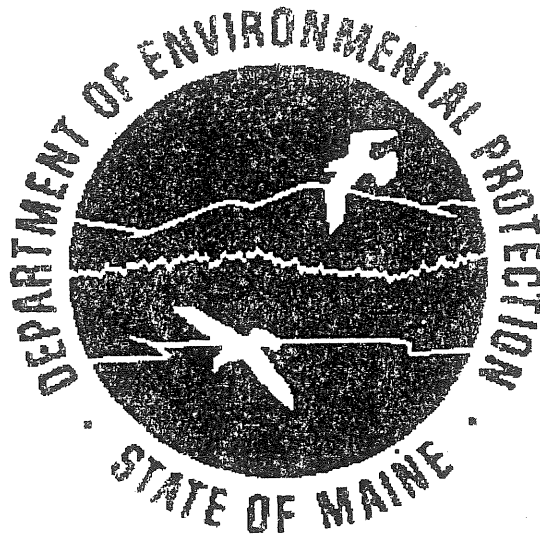
Robert G. Gerber, Inc.  
Professional Engineer  
1000 North Main Street  
Cincinnati, Ohio 45202  
Tel. 513-251-1111

DATE	10/1/85
PROJECT	INDUSTRIAL ZONE
SCALE	AS SHOWN
BY	R.G.G.
CHECKED BY	R.G.G.

DRAGON INDUSTRIAL ZONE

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Article 8  
Performance Standards for Quarries  
38 M.R.S.A. §§ 490-W to 490-EE



Bureau of Land and Water Quality  
DEPLW96-1

JULY 4, 1996



## PERFORMANCE STANDARDS FOR QUARRIES

38 MRSA §§490-W TO 490-EE

*Notes Concerning the Text*  
*July 4, 1996*

*The following text of Article 8 (Performance Standards for Quarries) includes amendments made by the One Hundredth and Seventeenth Legislature, Second Regular Session. The table of contents and footnotes have been added to this document by the Department of Environmental Protection and are not part of the statutory text.*

*All copyrights and other rights to statutory text are reserved by the State of Maine. The text included in this publication is current to the end of the Second Regular Session of the 117th Legislature but is subject to change without notice. It is a version that is presumed accurate but which has not been officially certified by the Secretary of State. Refer to the Maine Revised Statutes Annotated and supplements for certified text.*

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**ARTICLE 8-A**  
**PERFORMANCE STANDARDS FOR QUARRIES**

**§490-W. Definitions**

As used in this article, unless the context otherwise indicates, the following terms have the following meanings.

**1. Affected land.** "Affected land" means all reclaimed and unreclaimed land, land that has or will have the overburden removed, land on which stumps, spoil or other solid waste has or will be deposited and storage areas or other land, except natural buffer strips, that will be or has been used in connection with a quarry.

**2. Airblast.** "Airblast" means an atmospheric compression wave resulting from the detonation of explosives, whether resulting from the motion of blasted materials or the expansion of gases from the explosion.

**3. Blaster.** "Blaster" means a person qualified to be in charge of or responsible for the loading and firing of a blast.

✓ **4. Blasting.** "Blasting" means the use of explosives to break up or otherwise aid in the extraction or removal of a rock or other consolidated natural formation.

✓ **5. Blast site.** "Blast site" means the area where explosive material is handled during the loading of drilled blastholes, including the perimeter formed by the loaded blastholes and 50 feet in all directions from loaded blastholes.

**6. Detonating cord.** "Detonating cord" means a flexible cord containing a center core of high explosives that may be used to initiate other explosives.

**7. Explosive.** "Explosive" means any chemical compound or other chemical substance that contains oxidizing or combustible materials used for the purpose of producing an explosion intended to break or move rock, earth or other materials.

**8. Flyrock.** "Flyrock" means rock that is propelled through the air or across the ground as a result of blasting and that leaves the blast area.

**9. Matting.** "Matting" means a covering placed over load holes and adjacent areas in order to minimize generation of flyrock and limit airblast effects.

✓ **10. Natural buffer strip.** "Natural buffer strip" means an undisturbed area or belt of land that is covered with trees or other vegetation.

**11. Passenger car equivalents at peak hour.** "Passenger car equivalents at peak hour" means the number of passenger cars, or, in the case of nonpassenger vehicles, the number of passenger cars that would be displaced by nonpassenger vehicles, that pass through an intersection or on a roadway under prevailing roadway and traffic conditions at that hour of the day during which traffic volume generated by the development is higher than the volume during any other hour of the day. For purpose of this article, one tractor-trailer combination is the equivalent of 2 passenger cars.

**12. Peak particle velocity.** "Peak particle velocity" means the maximum rate of ground movement measured by any of the 3 mutually perpendicular components of ground motion.

**13. Preblast survey.** "Preblast survey" means documentation, prior to the initiation of blasting, of the condition of buildings, structures, wells or other infrastructures; protected natural resources; historic sites; and unusual natural areas.

**14. Private drinking water supply.** "Private drinking water supply" means a surface water supply, a dug well, a spring or a hole drilled, driven or bored into the earth that is used to extract drinking water for human consumption and that is not part of a public drinking water supply.

**15. Production blasting.** "Production blasting" means blasting conducted for the purpose of extracting or removing natural materials for commercial sale or beneficiation.

**16. Public drinking water source.** "Public drinking water source " means a groundwater well or a surface water source that directly or indirectly serves a water distribution system that has at least 15 service connections or regularly services an average of at least 25 individuals daily at least 60 days of the year.

✓ **17. Quarry.** "Quarry" means a place where rock is excavated.

**18. Reclamation.** "Reclamation" means the rehabilitation of the area of land affected by mining, including, but not limited to, the stabilization of slopes and creation of safety benches, the planting of forests, the seeding of grasses and legumes for grazing purposes, the planting of crops for harvest and the enhancement of wildlife and aquatic habitat and aquatic resources. "Reclamation" does not include the filling in of pits and the filling or sealing of shafts and underground workings with solid materials unless necessary for the protection of groundwater or for reasons of safety.

**19. Regulator.** "Regulator" means:

A. For a quarry located wholly within a municipality that is registered under section 490-DD to enforce this article, the municipality; and

B. For all other quarries, the Department of Environmental Protection.

20. **Rock.** "Rock" means a hard, nonmetallic material that requires cutting, blasting or similar methods of forced extraction.

21. **Stemming.** "Stemming" means inert material used in a blasthole to confine the gaseous products of detonation.

22. **Surface blasting.** "Surface blasting" means any blasting for which the blast area lies at the surface of the ground.

23. **Underground production blasting.** "Underground production blasting" means a blasting operation carried out beneath the surface of the ground by means of shafts, declines, adits or other openings leading to the natural material being mined or extracted.

#### §490-X. Applicability

This article applies to any quarry that is more than one acre in size, including reclaimed and unreclaimed areas, or at which underground production blasting is proposed.

The article does not apply to a quarry located wholly within the jurisdiction of the Maine Land Use Regulation Commission.

This article does not apply to an excavation or grading preliminary to a construction project, unless intended to circumvent this article.

A person with a valid permit for a quarry under article 6 must operate that quarry in compliance with the terms and conditions of that permit. Any modification of the permit must be in conformance with section 484. A person with a permit under article 6 may file a notice of intent to comply with this article. The permit issued under article 6 lapses as of the date a complete notice of intent is filed with the department. If the permittee chooses to substitute a notification pursuant to this article, all terms and conditions that applied to the permit issued pursuant to article 6 are incorporated into the notification approved pursuant to this article.

#### §490-Y. Notice of intent to comply

Except as provided in section 484-A, a person intending to create or operate a quarry under this article must file a notice of intent to comply before the total area of excavation of rock or overburden on the parcel exceeds one acre. Both reclaimed and unreclaimed areas are added together in determining whether this one-acre threshold is exceeded. A notice filed under this section must be complete, submitted on forms approved by the department and mailed to the <sup>1</sup>municipality where the quarry is located, <sup>2</sup>the department, the <sup>3</sup>Maine Historic Preservation Commission and <sup>4</sup>each abutting property owner. The notice that is mailed to the department must be sent by certified mail, return receipt requested. Upon receiving the postal receipt, the owner or operator may commence operation of the quarry.

A notice of intent to comply is not complete unless it includes the following:

**1. Name, address and telephone number.** The name, mailing address and telephone number of the owner of the quarry and, if different from the owner, the operator of the quarry;

**2. Map and site plan.** A location map and site plan drawn to scale showing property boundaries, stockpile areas, existing reclaimed and unreclaimed lands, proposed maximum acreage of all affected lands, all applicable private drinking water supplies or public drinking water sources and all existing or proposed solid waste disposal areas;

**3. Parcel description.** A description of the parcel including size and deed description;

**4. Legal interest.** A copy of the lease or other document showing that an operator who is not the owner has a legal right to excavate on the property. Stumpage information does not have to be shown;

**5. Information on abutters.** The names and addresses of abutting property owners;

**6. Signed statement.** A statement signed and dated by the owner or operator certifying that the quarry will be operated in compliance with this article; and

**7. Fees.** A fee paid to the department as provided by section 490-EE.

If the department determines that a notice filed under this section is not complete, the department must notify the owner or operator no later than 45 days after receiving the notice.

#### **§490-Z. Performance standards for quarries**

**1. Significant wildlife habitat.** Affected land may not be located in a significant wildlife habitat as defined in section 480-B, subsection 10 or in an area listed pursuant to the Natural Areas Program, Title 5, section 13076. The department may not grant a variance from the provisions of this subsection.

**2. Solid waste.** Solid waste, including stumps, wood waste and land-clearing debris generated on the affected land must be disposed of in accordance with chapter 13, including any rules adopted to implement those laws. The department may not grant a variance from the provisions of this subsection.

**3. Groundwater protection.** To ensure adequate groundwater protection, the following setback requirements must be met.

A. A 200-foot separation must be maintained between an excavation and a private drinking water supply that is point driven or dug and was in existence prior to the excavation.

B. A 100-foot separation must be maintained between an excavation and a private drinking water supply that is drilled into saturated bedrock and was in existence prior to the excavation.

C. Separation must be maintained between an excavation and a public drinking water source as follows:

(1) For systems serving a population of 500 persons or less, the minimum separation must be 300 feet;

(2) For systems serving a population of 501 persons up to 1,000 persons, the separation must be 500 feet;

(3) For systems serving a population of more than 1,000 persons, the separation must be 1,000 feet; and

(4) For any system that holds a valid filtration waiver in accordance with the federal Safe Drinking Water Act, 42 United States Code, Sections 300f to 300j-26 (1988), the separation must be 1,000 feet.

D. Refueling operations, oil changes, other maintenance activities requiring the handling of fuels, petroleum products and hydraulic fluids and other on-site activity involving storage or use of products that, if spilled, may contaminate groundwater, must be conducted in accordance with the department's spill prevention, control and countermeasures plan. Petroleum products and other substances that may contaminate groundwater must be stored and handled over impervious surfaces that are designed to contain spills. The spill prevention, control and countermeasures plan must be posted at the site.

E. In the event of excavation below the seasonal high water table, a 300-foot separation must be maintained between the limit of excavation and any predevelopment private drinking water supply and a 1000-foot separation must be maintained between the limit of excavation and any public drinking water source or area previously designated for potential use as a public drinking water source by a municipality or private water company.

The department may grant a variance from the provisions of paragraph C upon consultation with the persons or entity that controls the public drinking water supply affected by the excavation. The department may not grant a waiver from the provisions of paragraph A, B or D.

Excavation below the seasonal highwater table of an area previously designated for potential use as a public drinking water source by a municipality or private water company is prohibited. The department may grant a variance allowing excavation below the seasonal highwater table if the applicant demonstrates that the yield of groundwater flow to protected waters or wetlands or public drinking water sources or private drinking water supplies will not be adversely affected by the excavation.

In the event of excavation below the seasonal highwater table, the operator of a mining activity that affects by excavation activities a public drinking water source or private drinking water supply by contamination, interruption or diminution must restore or replace the affected water supply with an alternate source of water, adequate in quantity and quality for the purpose served by the supply. This provision is not intended to replace any independent action that a person may have whose water supply is affected by a mining activity.

**4. Natural buffer strip.** Existing vegetation within a natural buffer strip may not be removed. If vegetation within the natural buffer strip has been removed or disturbed by the excavation or activities related to operation of a quarry before submission of a notice of intent to comply, that vegetation must be reestablished as soon as practicable after filing the notice of intent to comply. The department may not grant a variance from the provisions of this subsection.

**5. Protected natural resources.** A natural buffer strip must be maintained between the working edge of an excavation and a river, stream, brook, great pond or coastal wetland as defined in section 480-B. A natural buffer strip must also be maintained between the working edge of an excavation and certain freshwater wetlands as defined in section 480-B and having the characteristics listed in paragraph B. Excavation activities conducted within 100 feet of a protected natural resource must comply with the applicable permit requirements under article 5-A. The width requirements for natural buffer strips are as follows.

A. A natural buffer strip at least 100 feet wide must be maintained between the working edge of the excavation and the normal high water line of a great pond classified as GPA or a river flowing to a great pond classified as GPA.

B. A natural buffer strip at least 75 feet wide must be maintained between the working edge of the excavation and a body of water other than as described in paragraph A, a river, stream or brook, coastal wetland or significant wildlife habitat contained within a freshwater wetland consisting of or containing:

(1) Under normal circumstances, at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation or open water, except for artificial ponds or impoundments; or

(2) Peat lands dominated by shrubs, sedges and sphagnum moss.

For purposes of this subsection, the width of a natural buffer strip is measured from the upland edge of a floodplain wetland. If no floodplain wetlands are present, the width is measured from the normal high water mark of the river, stream or brook. The width is measured from the normal high water mark of a great pond and upland edge of a freshwater or coastal wetland.

The department may not grant a variance from this subsection.

**6. Roads.** A natural buffer strip must be maintained between the working edge of an excavation and a road as follows.



A. A natural buffer strip at least 150 feet wide must be maintained between the working edge of an excavation and a road designated as a scenic highway by the Department of Transportation.

B. A natural buffer strip at least 100 feet wide must be maintained between the working edge of the excavation and any other public road.

C. A natural buffer strip at least 50 feet wide must be maintained between the working edge of an excavation and a private road or a right-of-way. If a private road is contained within a wider right-of-way, the buffer is measured from the edge of the right-of-way. The width of the natural buffer strip adjacent to a private road may be reduced if the applicant receives written permission from the persons having a right-of-way over the private road.

The department may not grant a variance from the provisions of paragraph A or C. The department may grant a variance from paragraph B if the variance does not result in the natural buffer strip being reduced to less than 50 feet between the working edge of the excavation and any road and if the owner or operator installs visual screening and safety measures as required by the department.

A distance specified in this subsection is measured from the outside edge of the shoulder of the road unless otherwise specifically provided.

**7. Property boundary.** A natural buffer strip at least 100 feet wide must be maintained between an excavation and any property boundary. This distance may be reduced to 10 feet with the written permission of the affected abutting property owner or owners, except that the distance may not be reduced to less than 25 feet from the boundary of a cemetery or burial ground. The natural buffer strip between quarries owned by abutting owners may be eliminated with the abutter's written permission if the elimination of this natural buffer strip does not increase the runoff from either excavation across the property boundary. All property boundaries must be identified in the field by markings such as metal posts, stakes, flagging or blazed trees. The department may not grant a variance from the provisions of this subsection.

**8. Erosion and sedimentation control.** All reclaimed and unreclaimed areas, except for access roads, must be naturally internally drained at all times unless a variance is obtained from the department. Stockpiles consisting of topsoil to be used for reclamation must be seeded, mulched or otherwise temporarily stabilized.

A. Sediment may not leave the parcel or enter a protected natural resource.

B. Grubbed areas not internally drained must be stabilized.

C. Erosion and sedimentation control for access roads must be conducted in accordance with the department's best management practices for erosion and sedimentation control.

The department may not grant a variance from the provisions of paragraph A, B or C.

**9. Surface water protection and storm water management.** Surface water discharges from areas not required to be naturally internally drained may not be increased as a result of storm water runoff from storms up to a level of a 25-year, 24-hour storm. Accumulated water from precipitation must be put into sheet flow and the discharge point must be directed to an undisturbed natural buffer strip. The discharge point must be at least 250 feet away from a protected natural resource. The slope of the discharge area may not exceed 5%.

Grading or other construction activity on the site may not alter natural drainageways so that the drainage, other than that which occurred before development, adversely affects an adjacent parcel of land or so that the drainageways flowing from an adjacent parcel of land to the parcel are impeded.

Structures such as detention ponds, retention ponds and undersized culverts may not be used to meet the standard in this subsection unless a variance is obtained from the department.

**10. Traffic.** The following provisions govern traffic.

A. Entrances and exits of the quarry must be located, posted and constructed in accordance with standards for roadways in rules adopted by the board. Adequate distances for entering, exiting and stopping must be maintained in accordance with these standards. The department may not grant a variance from the provisions of this subsection. This paragraph is repealed July 1, 1997.

B. Any excavation activity that generates 100 or more passenger car equivalents at peak hour must comply with the applicable permit requirements under article 6. This paragraph takes effect July 1, 1997.

**11. Noise.** Noise levels may not exceed applicable noise limits in rules adopted by the board.

**12. Dust.** Dust generated by activities at a quarry, including dust associated with traffic to and from a quarry, must be controlled by sweeping, paving, watering or other best management practices for control of fugitive emissions. Dust control methods may include calcium chloride as long as the manufacturer's labeling guidelines are followed. The department may not grant a variance from the provisions of this subsection.

**13. Reclamation.** The affected land must be restored to a condition that is similar to or compatible with the conditions that existed before excavation. Reclamation may be conducted in accordance with the department's best management practices for erosion and sedimentation control and must include the following.

A. Highwalls, or quarry faces, must be treated in such a manner as to leave them in a condition that minimizes the possibility of rock falls, slope failures and collapse. A highwall that is loose must be controlled by the use of blasting or scaling, the use of safety benches, the

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Article 10  
re DEP  
Site Act  
Regs.

use of flatter slopes or reduced face heights or the use of benching near the top of the face or rounding the edge of the face.

B. A vegetative cover must be established by seeding or planting within one year of the completion of excavation. Vegetative cover must be established on all affected land, including safety benches, except for quarry walls and flooded areas. Topsoil must be placed, seeded and mulched within 30 days of final grading. Vegetative cover is acceptable if within one year of seeding:

(1) The planting of trees and shrubs results in a permanent stand or a stand capable of regeneration and succession sufficient to ensure a 75% survival rate; and

(2) The planting of all material results in permanent 90% ground cover.

Vegetative cover used in reclamation must consist of grasses, legumes, herbaceous or woody plants, shrubs, trees or a mixture of these.

C. All structures, once no longer in use, and all access roads, haul roads and other support roads must be reclaimed.

D. All affected lands must be reclaimed within 2 years after final grading.

E. Topsoil that is stripped or removed must be stockpiled for use in reclaiming disturbed land areas. The department may grant a variance from this paragraph if the applicant demonstrates that the soil is not needed for reclamation purposes.

F. The department may require a bond payable to the State with sureties satisfactory to the department or such other security as the department determines adequately secures compliance with this article, conditioned upon the faithful performance of the requirements set forth in this article. Other security may include a security deposit with the State, an escrow account and agreement, insurance or an irrevocable trust. In determining the amount of the bond or the security, the department shall take into consideration the character and nature of the overburden, the future suitable use of the land involved and the cost of grading and reclamation required. All proceeds of forfeited bonds or other security must be expended by the department for the reclamation of the area for which the bond was posted and any remainder returned to the operator.

G. The board may adopt or amend rules to carry out this subsection, including rules relating to operational or maintenance plans; standards for determining the reclamation period; annual revisions of those plans; limits, terms and conditions on bonds or other security; proof of financial responsibility of a person engaged in excavation activity or the affiliated person who guarantees performance; estimation of reclamation costs; reports on reclamation activities; and the manner of determining when the bond or other security may be discharged.

**14. Blasting.** The applicant must ensure that the blasting is conducted in accordance with Title 25, section 2441.

A. The owner or operator shall use sufficient stemming, matting or natural protective cover to prevent flyrock from leaving property owned or under control of the owner or operator or from entering protected natural resources or natural buffer strips. Crushed rock or other suitable material must be used for stemming when available; native gravel, drill cuttings or other material may be used for stemming only if no other suitable material is available.

B. The maximum allowable airblast at any inhabited building not owned or controlled by the developer may not exceed 129 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz.

C. The maximum allowable airblast at an uninhabited building not owned or controlled by the developer may not exceed 140 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz.

D. Monitoring of airblast levels is required in all cases for which a preblast survey is required by paragraph F. The department may waive the monitoring requirement if the owner or operator secures the permission of affected property owners to increase allowable airblast levels on their property and the department determines that no protected natural resource will be adversely affected by the increased airblast levels.

E. If a blast is to be initiated by detonating cord, the detonating cord must be covered by crushed rock or other suitable cover to reduce noise and concussion effects.

F. A preblast survey is required for all production blasting and must extend a minimum radius of 2000 feet from the blast site. The preblast survey must document any preexisting damage to structures and buildings and any other physical features within the survey radius that could reasonably be affected by blasting. Assessment of features such as pipes, cables, transmission lines and wells and other water supply systems must be limited to surface conditions and other readily available data, such as well yield and water quality. The preblast survey must be conducted prior to the initiation of blasting at the operation. The owner or operator shall retain a copy of all preblast surveys for at least one year from the date of the last blast on the development site.

(1) The owner or operator is not required to conduct a preblast survey if the department determines that no protected natural resource within the limits of the otherwise required survey is likely to be affected by blasting and production blasting will not occur within 2000 feet of any building not owned or under the control of the developer.

(2) The owner or operator is not required to conduct a preblast survey on properties for which the owner or operator documents the rejection of an offer by registered letter, return receipt requested, to conduct a preblast survey. Any person owning a building within a preblast survey radius may voluntarily waive the right to a survey.

(3) The owner or operator is not required to conduct a preblast survey if the owner or operator agrees to design all blasts so that the weight of explosives per eight millisecond or greater delay does not exceed that determined by the equation  $W=(D/D_s)^2$ , where W is the maximum allowable weight of explosives per delay of 8 milliseconds or greater, D is the shortest distance between any area to be blasted and any inhabitable structure not owned or controlled by the developer and  $D_s$  equals 70 ft./ $(lb.)^{1/2}$ .

G. Blasting may not occur in the period between sundown and sunrise the following day or in the period 7:00 p.m. and 7:00 a.m., whichever is greater. Routine production blasting is not allowed in the daytime on Sunday. Detonation of misfires may occur outside of these times but must be reported to the department within 5 business days of the misfire detonation. Blasting may not occur more frequently than 4 times per day. Underground production blasting may be exempted from these requirements provided that a waiver is granted by the department.

H. Sound from blasting may not exceed the following limits at any protected location:

Number of Blast Per Day	Sound Level Limit
1	129 dbl
2	126 dbl
3	124 dbl
4	123 dbl

I. The maximum peak particle velocity at inhabitable structures not owned or controlled by the developer may not exceed the levels established in Table 1 in paragraph K and the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1. The department may grant a variance to allow ground vibration levels greater than 2 inches per second on undeveloped property not owned or controlled by the applicant if the department determines that no protected natural resource, unusual natural area or historic site will be adversely affected by the increased ground vibration levels. If inhabitable structures are constructed on the property after approval of the development and prior to completion of blasting, the developer immediately must notify the department and modify blasting procedures to remain in compliance with the standards of this subsection.

J. Based upon an approved engineering study, the department may grant a variance to allow higher vibration levels for certain buildings and infrastructures. In reviewing a variance application, the department shall take into account that the standards in this paragraph and paragraph I are designed to protect conventional low-rise structures such as churches, homes and schools. In cases of practical difficulty, the department may grant a variance from paragraph I if it can be demonstrated that no adverse impacts on existing infrastructures or protected natural resources, unusual natural areas or historic sites will result.

K. Table 1 of this paragraph or the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 must be used to evaluate ground vibration effects for those blasts for which a preblast survey is required.

(1) Either Table 1 of this paragraph or graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 may be used to evaluate ground vibration effects when blasting is to be monitored by seismic instrumentation.

(2) Blasting measured in accordance with Table 1 of this paragraph must be conducted so that the peak particle velocity of any one of the 3 mutually perpendicular components of motion does not exceed the ground vibration limits at the distances specified in Table 1 of this paragraph.

(3) Seismic instruments that monitor blasting in accordance with Table 1 of this paragraph must have the instrument's transducer firmly coupled to the ground.

(4) An owner or operator using Table 1 of this paragraph must use the scaled-distance equation,  $W=(D/D_s)^2$ , to determine the allowable charge weight of explosives to be detonated in any 8 millisecond or greater delay period without seismic monitoring, where W is equal to the maximum weight of explosives, in pounds, and D and  $D_s$  are defined as in Table 1 of this paragraph. The department may authorize use of a modified scaled-distance factor for production blasting if the owner or operator can demonstrate to a 95% confidence level, based upon records of seismographic monitoring at the specific site of the mining activity covered by the permit, that use of the modified scaled-distance factor will not cause the ground vibration to exceed the maximum allowable peak particle velocities of Table 1 of this paragraph.

(5) Blasting monitored in accordance with the graph published by the United States Department of the Interior in "Bureau of Mines Report of Investigations 8507," Appendix B, Figure B-1 must be conducted so that the continuously variable particle velocity criteria are not exceeded.

The owner or operator may apply for a variance of the ground vibration monitoring requirement prior to conducting blasting at the development site if the owner or operator agrees to design all blasts so that the weight of explosives per 8 millisecond or greater delay does not exceed that determined by the equation  $W=(D/D_s)^2$ , where W is the maximum allowable weight of explosives per delay of 8 milliseconds or greater, D is the shortest distance between any area to be blasted and any inhabitable structure not owned or controlled by the developer and  $D_s$  equals 70 ft./lb.<sup>1/2</sup>. As a condition of the variance, the department may require submission of records certified as accurate by the blaster and may require the owner or operator to document compliance with the conditions of this paragraph.

The following is Table 1.

Distance versus Peak Particle Velocity Method

Distance (D) from the blast area (feet)	Maximum allowable peak particle velocity (Vmax) for ground vibration (in./sec.)	Scaled-distance factor (Ds) to be applied without seismic monitoring
0 to 300	1.25	50
301-5000	1.00	55
Greater than 5000	0.75	65

L. A record of each blast, including seismographic data, must be kept for at least one year from the date of the last blast, must be available for inspection at the development or at the offices of the owner or operator if the development has been closed, completed or abandoned before the one-year limit has passed and must contain at a minimum the following data:

- (1) Name of blasting company or blasting contractor;
- (2) Location, date and time of blast;
- (3) Name, signature and social security number of blaster;
- (4) Type of material blasted;
- (5) Number and spacing of holes and depth of burden or stemming;
- (6) Diameter and depth of holes;
- (7) Type of explosives used;
- (8) Total amount of explosives used;
- (9) Maximum amount of explosives used per delay period of 8 milliseconds or greater;
- (10) Maximum number of holes per delay period of 8 milliseconds or greater;
- (11) Method of firing and type of circuit;

- (12) Direction and distance in feet to the nearest dwelling, public building, school, church or commercial or institutional building neither owned nor controlled by the developer;
- (13) Weather conditions, including such factors as wind direction and cloud cover;
- (14) Height or length of stemming;
- (15) Amount of mats or other protection used;
- (16) Type of detonators used and delay periods used;
- (17) The exact location of each seismograph and the distance of each seismograph from the blast;
- (18) Seismographic readings;
- (19) Name and signature of the person operating each seismograph; and
- (20) Names of the person and the firm analyzing the seismographic data.

M. All field seismographs must record the full analog wave form of each of the 3 mutually perpendicular components of motion in terms of particle velocity. All seismographs must be capable of sensor check and must be calibrated according to the manufacturer's recommendations.

#### **§490-AA. Inspections**

The department may periodically inspect a site, examine relevant records of the owner or operator of a quarry, take samples and perform tests necessary to determine compliance with the provisions of this article.

#### **§490-BB. Enforcement and penalties**

The department shall administer and enforce the provisions of this article.

**1. Stop-work order.** The department may order the owner or operator of a quarry that is not operating in compliance with this article to cease operations until the noncompliance is corrected.

**2. Penalty.** A person who violates a provision of this article commits a civil violation and is subject to the penalties established under section 349. Penalties assessed for enforcement actions taken by the State are payable to the State.



**3. Reclamation.** If, after an opportunity for a hearing, the commissioner determines that the owner of an excavation site or the person who was engaged in the excavation activity at the excavation site has violated this article, the commissioner shall direct the department staff or contractors under the supervision of the commissioner to enter on the property and carry out the necessary reclamation. The person engaged in mining or any affiliated person who guarantees performance at the excavation site is liable for the reasonable expenses of this necessary reclamation. The commissioner may use the bond or other security paid under section 490-Z, subsection 13, paragraph F to meet the reasonable expenses of reclamation.

#### **§490-CC. Variances**

An owner or operator must comply with the performance standards in section 490-Z unless a variance from those performance standards is approved by the department. Except when prohibited by section 490-Z, the department may grant a variance from the performance standards in this article if the owner or operator affirmatively demonstrates to the department that the variance does not adversely affect natural resources or existing uses and does not adversely affect the health, safety and general welfare of the public. A variance application must include any fee applicable under section 490-EE. The department shall process the variance application according to chapter 2 and the rules adopted by the department for processing an application. An applicant for a variance under this article shall hold a public informational meeting as described in those rules.

The department shall publish a timetable for responding to variance applications in the same manner prescribed in section 344-B. A variance is not valid unless approved by the department and, if a municipality is the regulator, the municipality. In making its decision on a variance application, the department shall consider comments or information received and the compliance record of the owner or operator. The department shall inform the owner or operator of any significant concerns or issues raised.

#### **§ 490-DD. Municipal enforcement; registration**

A municipality may register for authority to enforce this article by adopting and submitting to the commissioner an ordinance that meets or exceeds the provisions of this article. The commissioner shall review that ordinance to determine whether that ordinance meets the provisions of this article and if the municipality has adequate resources to enforce the provisions of this article. If the commissioner determines that the ordinance meets the provisions of this article and that the municipality has the resources to enforce this article, the commissioner shall register that municipality for authority to enforce this article. Immediately upon approval by the commissioner, primary enforcement authority for this article vests in that municipality. The commissioner may not approve an ordinance under this section unless the ordinance requires that any request for a variance from the standards in the article be approved by the commissioner before the variance is valid.

**1. Relation to home rule.** This section may not be construed to limit a municipality's authority under home rule to adopt ordinances regulating quarries.

**2. Optional participation.** This article may not be construed to require a municipality to adopt any ordinance.<sup>1</sup>

**3. Suspension of approval.** The commissioner may act to enforce any provision of this article or suspend the registration of a municipality if the commissioner determines that a municipal ordinance no longer conforms to the provisions of this article or that the municipality is not adequately enforcing this article. The commissioner shall notify a municipality of any such determination in writing. Suspension of municipal registration by the commissioner does not void or in any way affect a municipal ordinance or in any way limit the municipality's authority to enforce the provisions of its ordinance.

**4. Appeal.** A municipality may appeal to the board any decision of the commissioner under this section. Any decision by the board on appeal by a municipality constitutes final agency action.

**§ 490-EE. Transfer of ownership or operation, review before expansion; fees**

**1. Review before expansion.** Before expanding a quarry beyond an area that exceeds a total of 10 acres of reclaimed and unreclaimed land and before each additional 10-acre expansion, the owner or operator shall notify the regulator of the owner's or operator's intent to expand and must request an inspection. In the same manner as prescribed in section 344-B, the department shall publish a timetable for responding to inspection requests and shall inspect the site within that time period to determine the quarry's compliance with this article and other applicable laws administered by the department. The department may defer an inspection for a reasonable period when winter conditions at the site prevent the department from evaluating an expansion request. The department shall notify the owner or operator of a deferral under this section. Excavation activities may continue after the filing of a notice of an intent to expand. The failure of a regulator to conduct a site visit within a published time period is not a sufficient basis for a stop-work order under section 490-BB, subsection 1.

At the time of filing a notification of intent to expand, the owner or operator shall pay any fee required by this section.

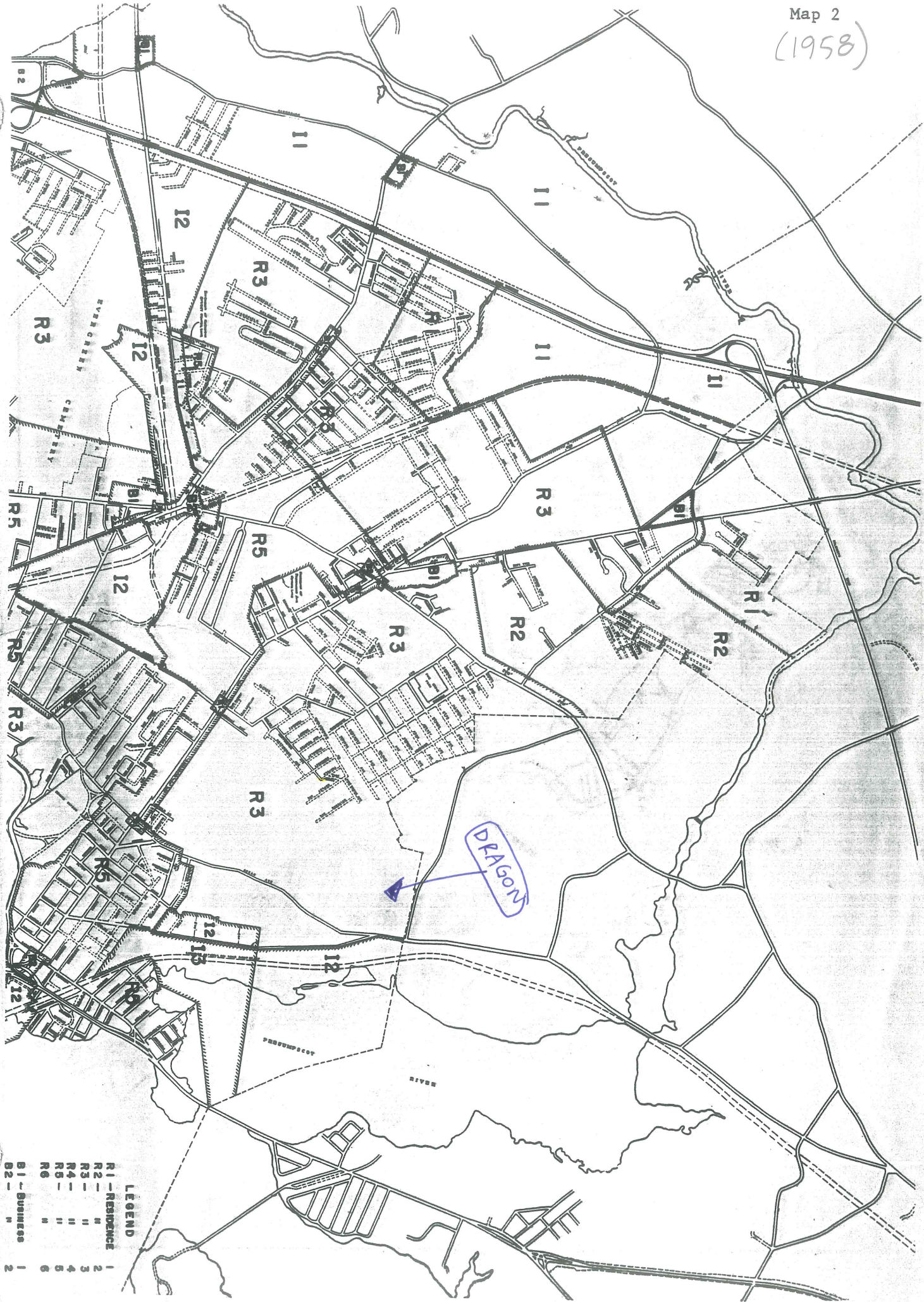
**2. Transfer of ownership or operation.** A person who purchases a quarry that is operated under a notice of intent to comply, as established under section 490-Y, or who obtains operating authority of a quarry that operates under a notice of intent to comply must file within 2 weeks after the purchase or the obtaining of operating authority a notice of intent to comply on a form developed by the department. The new owner or operator may operate the quarry during this 2-week period without having filed a notice of intent to comply if the new owner or operator complies with all standards of this article.

**3. Fees.** The owner or operator a quarry shall pay the regulator:

---

1





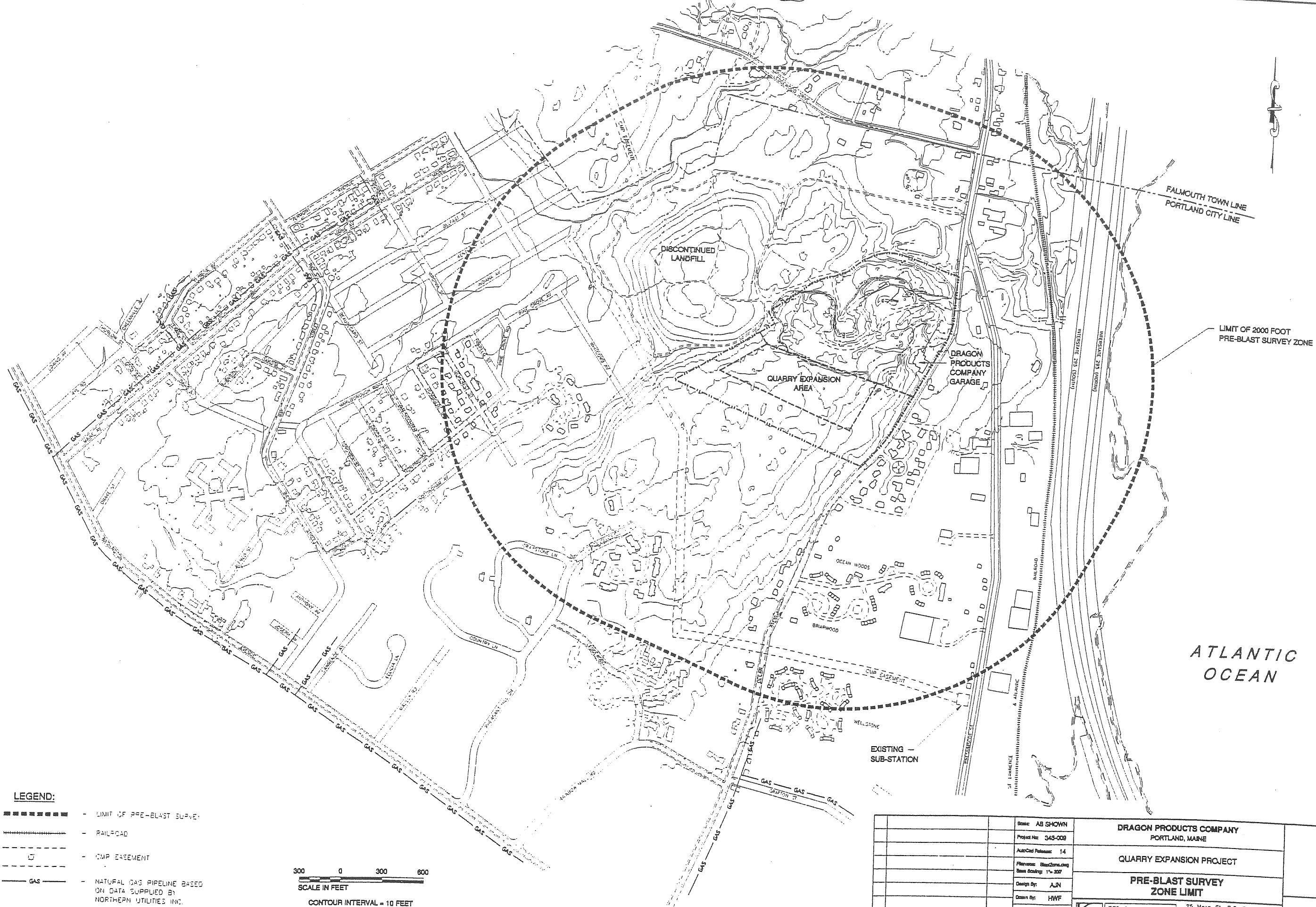
LEGEND

R1 -	Residence	1
R2 -	"	2
R3 -	"	3
R4 -	"	4
R5 -	"	5
R6 -	"	6
B1 -	Business	1
B2 -	"	2



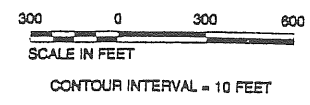
	<u>Existing Dragon Site</u>	<u>Proposed Dragon Site</u>	<u>Noise</u>	<u>Vibration</u>	<u>Dust</u>	<u>Appearance</u>
1.	Open Concrete Plant on Ocean Avenue	Enclosed Concrete Plant 400 feet from road at bottom of quarry	Far Less Noise (++)	Less Vibration on Ocean Ave. (+)	Less Dust (+)	Plant no longer visible (++)
2.	1,000 Cement Trucks on roads	1,000 Cement Trucks on roads	No Change	No Change	No Change	No Change
3.	1,000 Cement Trucks unloading near Ocean Avenue	1,000 Cement Trucks unloading at new plant	Far Less Noise (++)	No Change	Less Dust (+)	No longer visible (+)
4.	4,000 Sand Trucks on roads	4,000 Sand Trucks on roads	No Change	No Change	No Change	No Change
5.	4,000 Sand Trucks unload near Ocean Avenue	4,000 Sand Trucks unload at new plant	Less Noise (+)	Less Vibration (+)	Less Dust (+)	No longer visible (+)
6.	5,000 Stone Trucks on roads	No Stone Trucks	Far Less Noise (++)	Far Less Vibration (++)	Less Dust (+)	No longer visible (+)
7.	5,000 Stone Trucks unload near Ocean Avenue	No Stone Trucks	Less Noise (+)	Far Less Vibration (++)	Less Dust (+)	Improved View (+)
8.	12,000 Concrete Trucks leave current plant	12,000 Concrete Trucks exit new driveway	No Change	No Change	Less Dust (+)	No Change
9.	No Drilling for Blasting	Drilling for Blasting	New Noise < 65 decibels (-)	None Off Site	Minimal Dust (-)	No Change
10.	No Blasting	Blasting Stone per Me DEP Standards	20 blasts/year 1 second/blast (-)	20 blasts/year (slamming door nearby) (-)	20 blasts/year (-)	No Change
11.	Old Rock Crusher near Ocean Avenue	New enclosed rock crusher 750' from Ocean Avenue	New noise < 65 decibels (-)	None felt off-site	Most dust contained in enclosure (-)	No longer visible (+)
12.	Entrance to plant on Ocean Avenue hill	New Entrance at bottom of hill	No Change	No Change	Less Dust (+)	Improved Entrance (+)
13.	Two Lanes on Ocean Avenue	Third Travel Lane going up hill	No Change	No Change	No Change	Improved roadside (+)
14.	Poor Surface Water Drainage on Ocean Avenue	New Drainage Ditch on Ocean Avenue - Operations drain internally	No Change	No Change	No Plant run off (+)	Improved roadside (+)
15.	Old Equipment and Walls on Ocean Avenue	New landscaped berm on Ocean Avenue	Noise barrier (+)	Air blast barrier (+)	Dust barrier (+)	Much Improved View (++)

	<u>Existing Dragon Site</u>	<u>Proposed Dragon Site</u>	<u>Noise</u>	<u>Vibration</u>	<u>Dust</u>	<u>Appearance</u>
1.	Open Concrete Plant on Ocean Avenue	Enclosed Concrete Plant 400 feet from road at bottom of quarry	Far Less Noise (++)	Less Vibration on Ocean Ave. (+)	Less Dust (+)	Plant no longer visible (++)
2.	1,000 Cement Trucks on roads	1,000 Cement Trucks on roads	No Change	No Change	No Change	No Change
3.	1,000 Cement Trucks unloading near Ocean Avenue	1,000 Cement Trucks unloading at new plant	Far Less Noise (++)	No Change	Less Dust (+)	No longer visible (+)
4.	4,000 Sand Trucks on roads	4,000 Sand Trucks on roads	No Change	No Change	No Change	No Change
5.	4,000 Sand Trucks unload near Ocean Avenue	4,000 Sand Trucks unload at new plant	Less Noise (+)	Less Vibration (+)	Less Dust (+)	No longer visible (+)
6.	5,000 Stone Trucks on roads	No Stone Trucks	Far Less Noise (++)	Far Less Vibration (++)	Less Dust (+)	No longer visible (+)
7.	5,000 Stone Trucks unload near Ocean Avenue	No Stone Trucks	Less Noise (+)	Far Less Vibration (++)	Less Dust (+)	Improved View (+)
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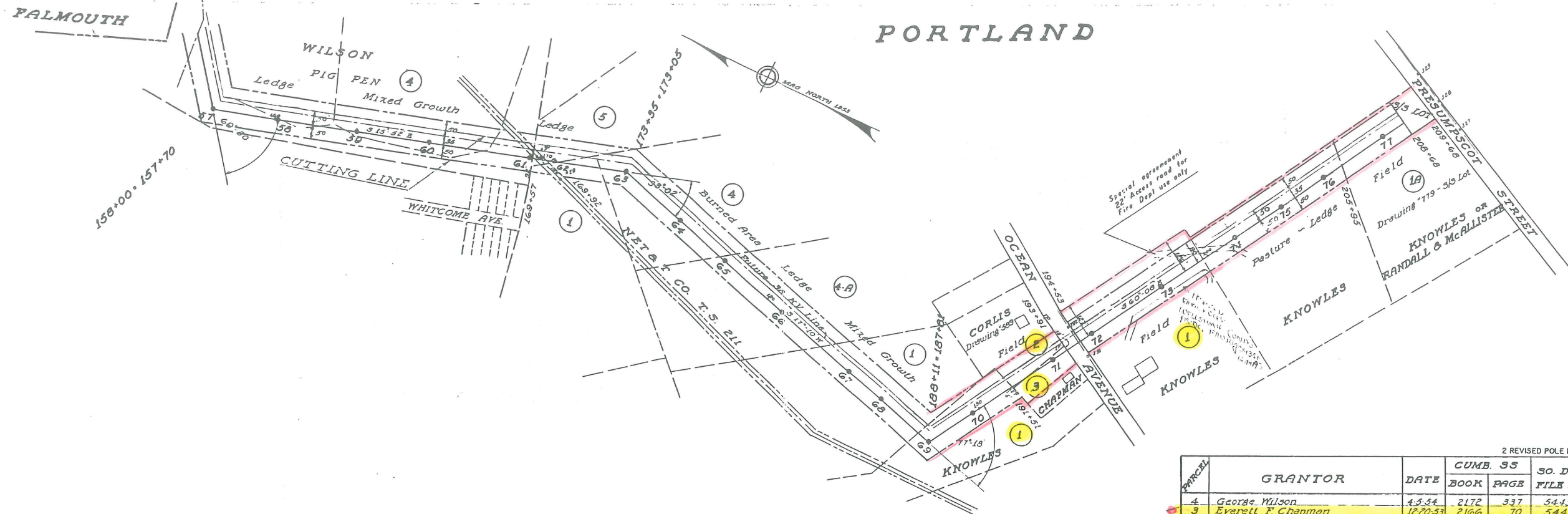


**LEGEND:**

- LIMIT OF PRE-BLAST SURVEY
- ==== RAILROAD
- - - - - CMP EASEMENT
- GAS — NATURAL GAS PIPELINE BASED ON DATA SUPPLIED BY NORTHERN UTILITIES INC.

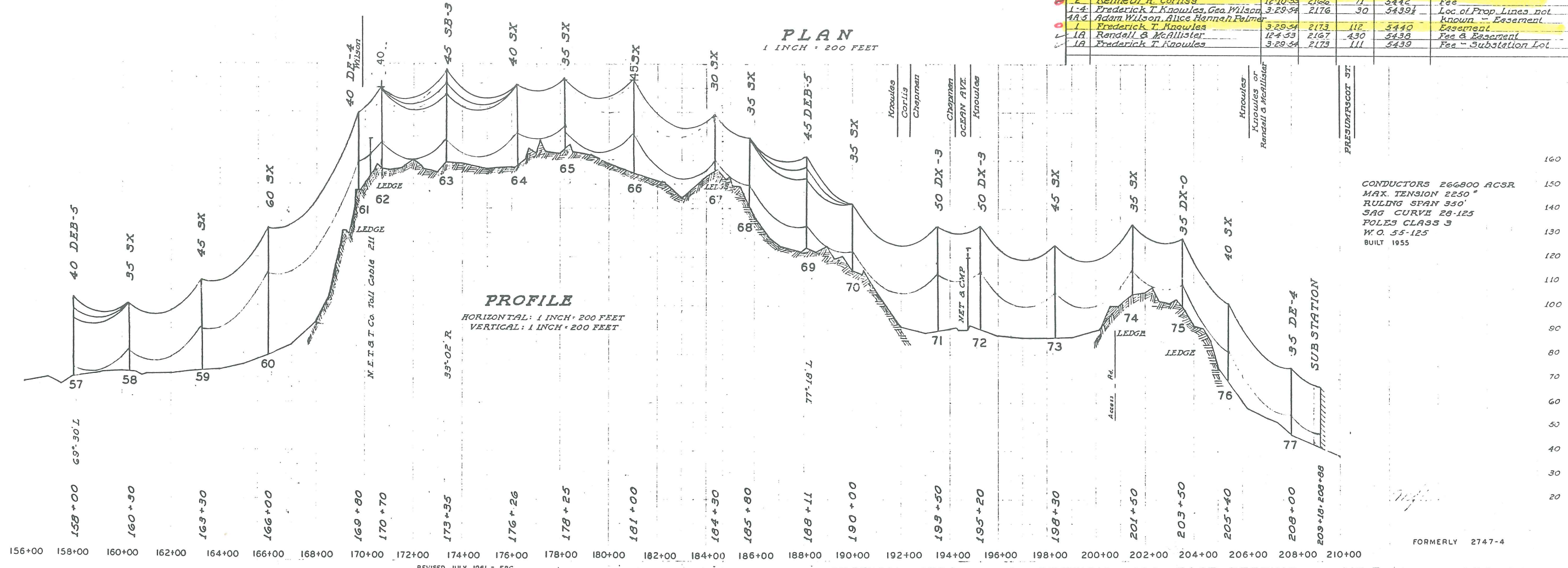


		Base: AS SHOWN	<b>DRAGON PRODUCTS COMPANY</b> PORTLAND, MAINE
		Project No: 343-009	
		AutoCad Release: 14	<b>QUARRY EXPANSION PROJECT</b>  <b>PRE-BLAST SURVEY</b> <b>ZONE LIMIT</b>
		Plotted: Blue/Coloring Base Scaling: 1" = 300'	
		Design By: AJN	<b>Kleinschmidt Associates</b> 75 Main St. P.O. Box 974 Pittsfield, Maine 04987 Telephone: (603) 885-1111
		Drawn By: HWF	
		Checked By: AJN	
1	ADDED GAS LINES	11-7-00	<b>D 1</b>
No.	Revision		



2 REVISED POLE HT. 03/29/96 DFW

PARCEL	GRANTOR	DATE	CUMB. 55		SO. DIV. FILE NO.	REMARKS
			BOOK	PAGE		
4	George Wilson	4-5-54	2172	337	5443	Easement
3	Frederick T. Knowles	12-20-53	2166	70	5441	Fee - Entire Lot
2	Kenneth K. Corliss	12-10-53	2166	71	5442	Fee
1-4	Frederick T. Knowles, Geo. Wilson	3-29-54	2176	30	5439	Loc. of Prop. Lines not known - Easement
AA-3	Adam Wilson, Alice Hannah Palmer	3-29-54	2173	112	5440	Easement
1	Frederick T. Knowles	12-4-53	2167	430	5438	Fee & Easement
1A	Randall & McAllister	3-29-54	2173	111	5439	Fee - Substation Lot



1953  
1955  
1955  
1955  
1955  
1955  
1955  
1955

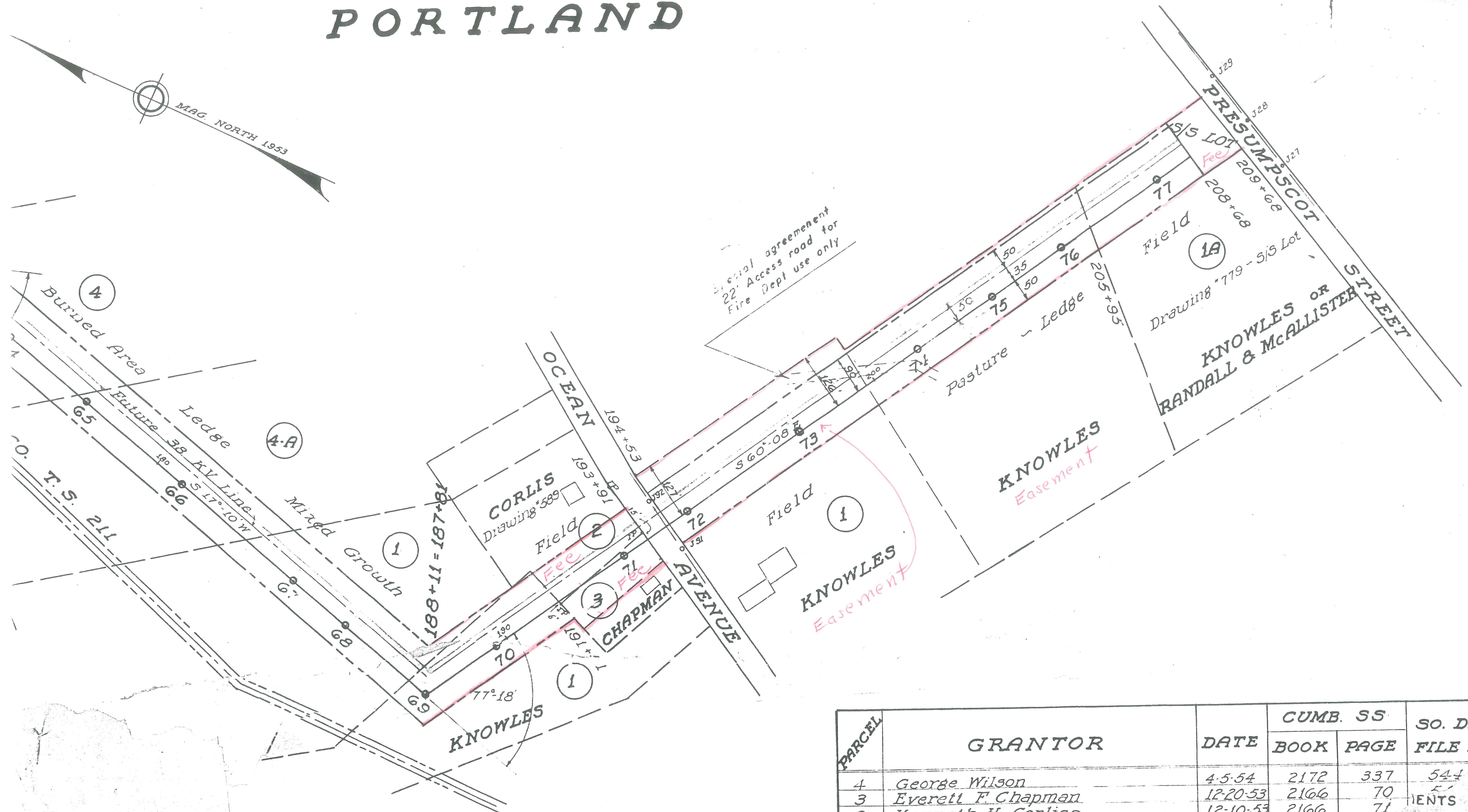
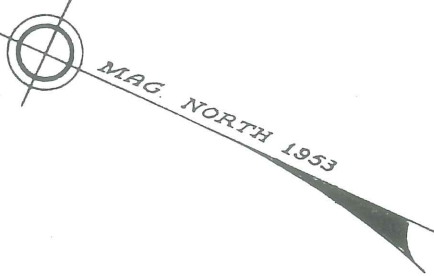
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EQUATION: -30

REVISED JULY 1961 - FBC



# PORTLAND



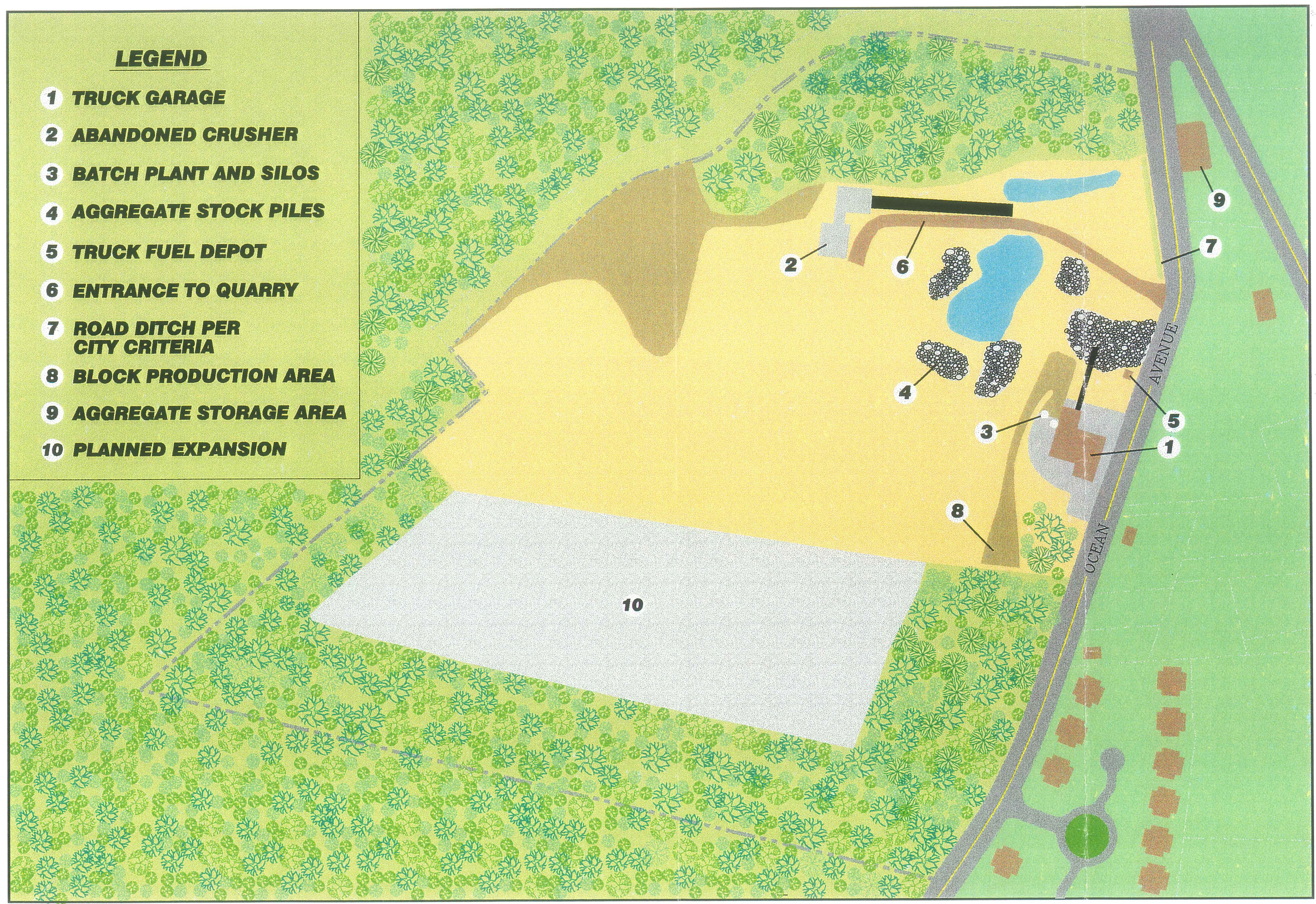
PARCEL	GRANTOR	DATE	CUMB. SS		SO. DIV. FILE NO
			BOOK	PAGE	
4	George Wilson	4-5-54	2172	337	544
3	Everett F. Chapman	12-20-53	2166	70	MENTS
2	Kenneth H. Corliss	12-10-53	2166	71	
1-4	Frederick T. Knowles, Geo. Wilson	3-29-54	2176		
4A-5	Adam Wilson, Alice Hannah Palmer				
1	Frederick T. Knowles	3-29-54			
1A	Frederick T. Knowles				

OPPOSITE DIRECTION



**LEGEND**

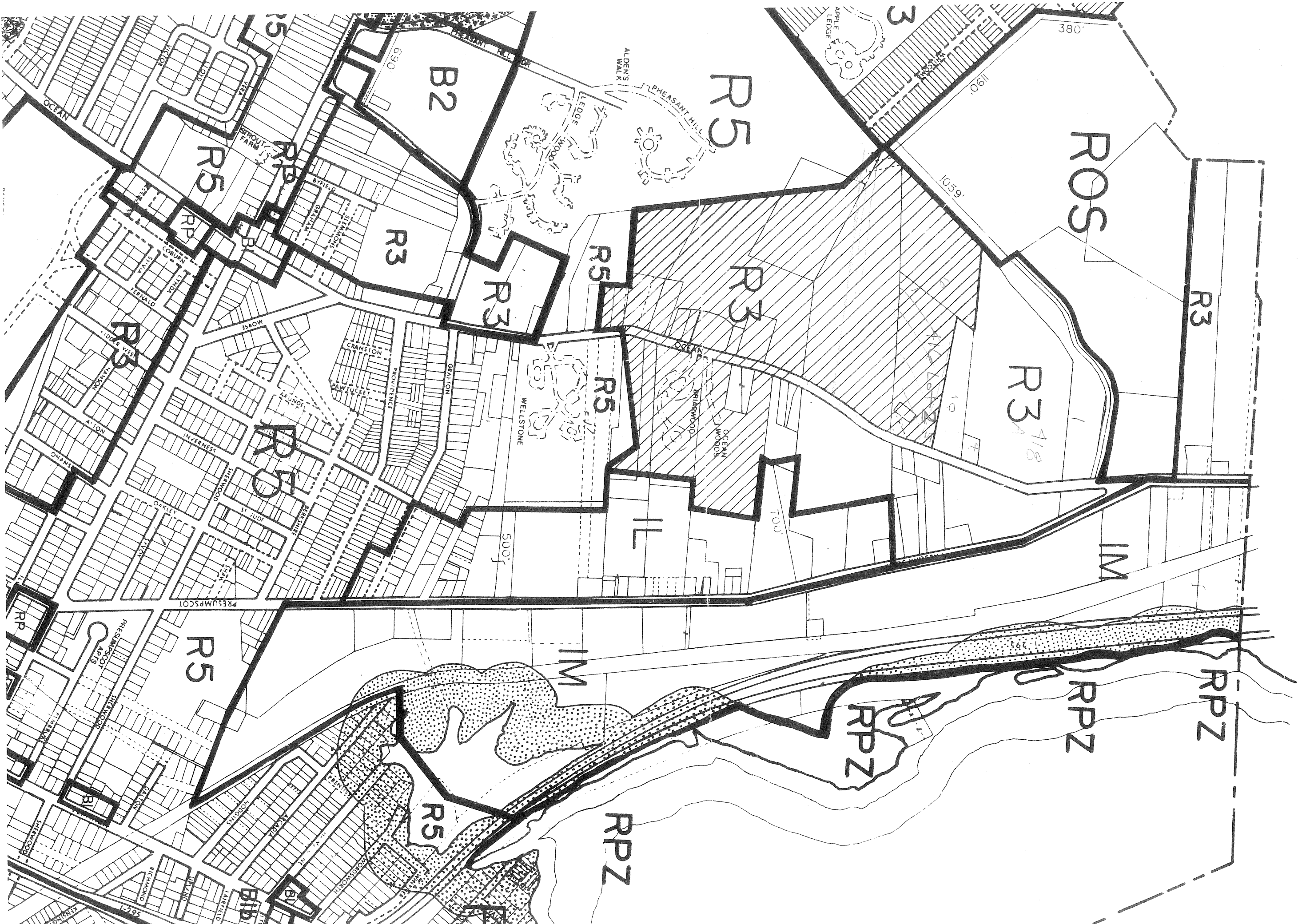
- 1 TRUCK GARAGE**
- 2 ABANDONED CRUSHER**
- 3 BATCH PLANT AND SILOS**
- 4 AGGREGATE STOCK PILES**
- 5 TRUCK FUEL DEPOT**
- 6 ENTRANCE TO QUARRY**
- 7 ROAD DITCH PER CITY CRITERIA**
- 8 BLOCK PRODUCTION AREA**
- 9 AGGREGATE STORAGE AREA**
- 10 PLANNED EXPANSION**







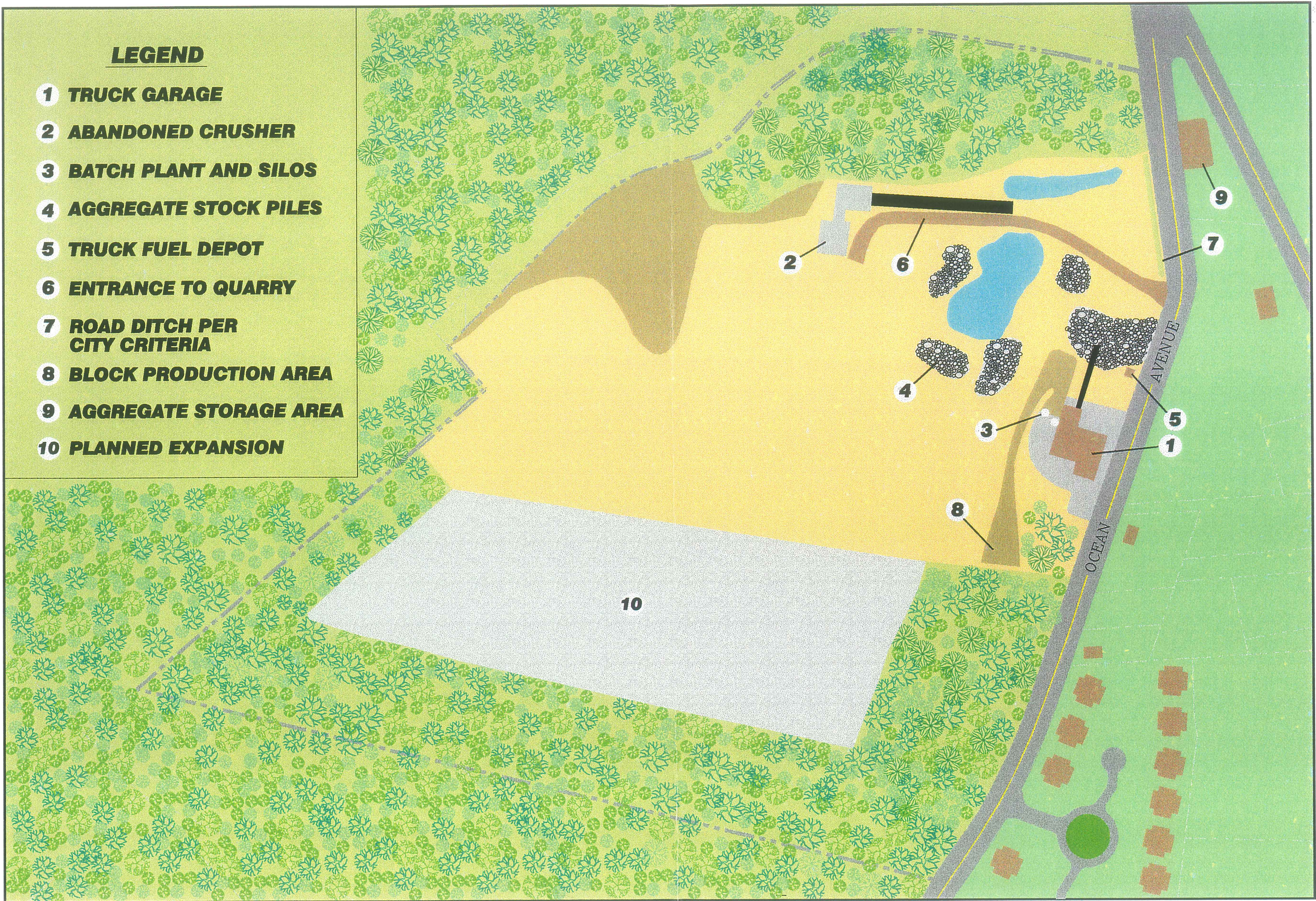
NOTE: A SHORELAND ZONE IS 250FT WIDE, WHILE A STREAM PROTECTION DISTRICT IS 75FT ON EITHER SIDE OF A STREAM.





**LEGEND**

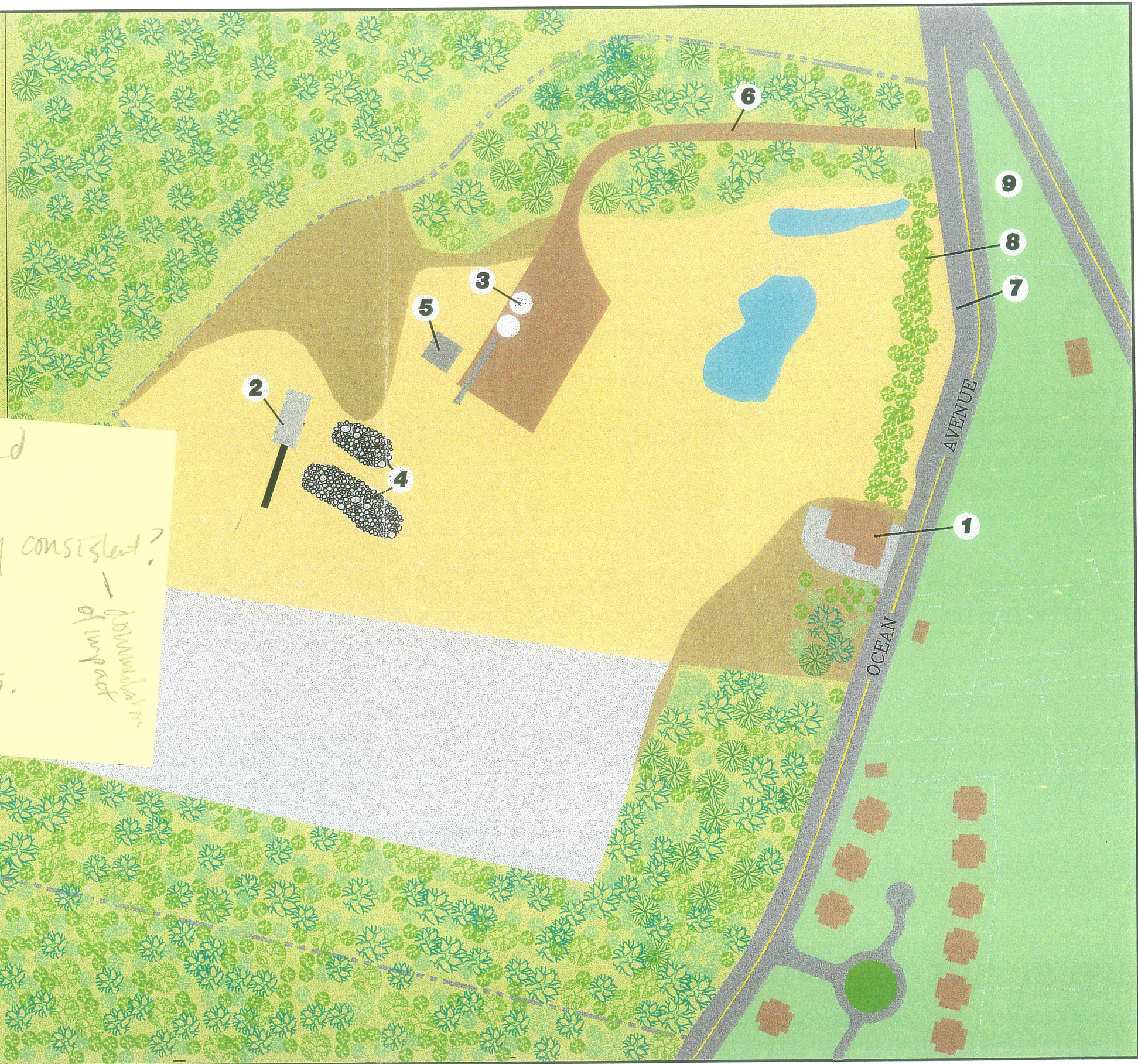
- 1 TRUCK GARAGE**
- 2 ABANDONED CRUSHER**
- 3 BATCH PLANT AND SILOS**
- 4 AGGREGATE STOCK PILES**
- 5 TRUCK FUEL DEPOT**
- 6 ENTRANCE TO QUARRY**
- 7 ROAD DITCH PER CITY CRITERIA**
- 8 BLOCK PRODUCTION AREA**
- 9 AGGREGATE STORAGE AREA**
- 10 PLANNED EXPANSION**





**LEGEND**

- 1 TRUCK GARAGE**
- 2 ENCLOSED CRUSHER**
- 3 BATCH PLANT AND SILOS**
- 4 AGGREGATE STOCK PILES**
- 5 TRUCK FUEL DEPOT**
- 6 ENTRANCE DRIVEWAY**



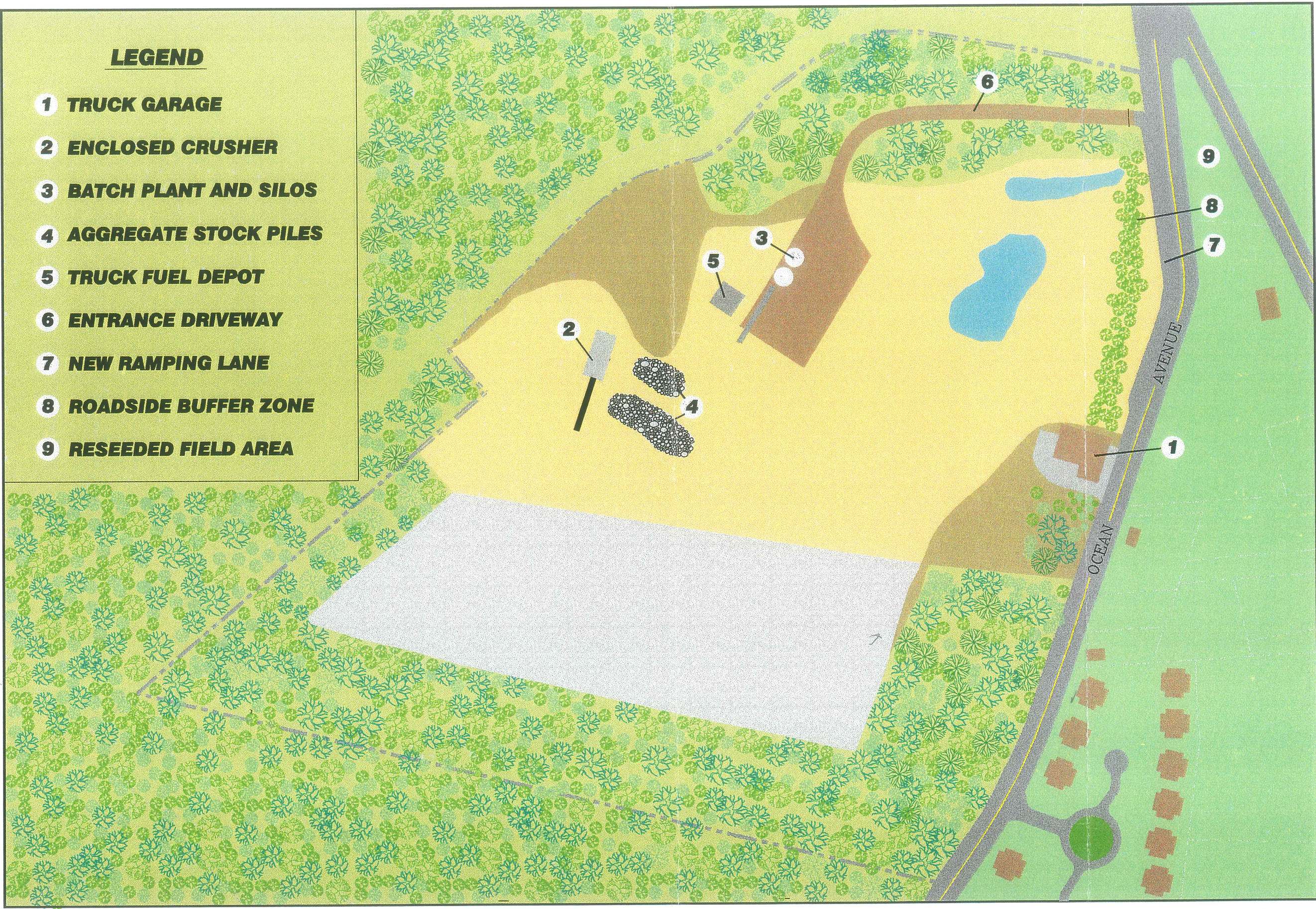
Dana - purchase of land from Cook  
is new driveway consistent?  
location of driveway  
- need full site plan.  
- need to know impacts.  
- possible ROW issues.

↓  
consideration of impact

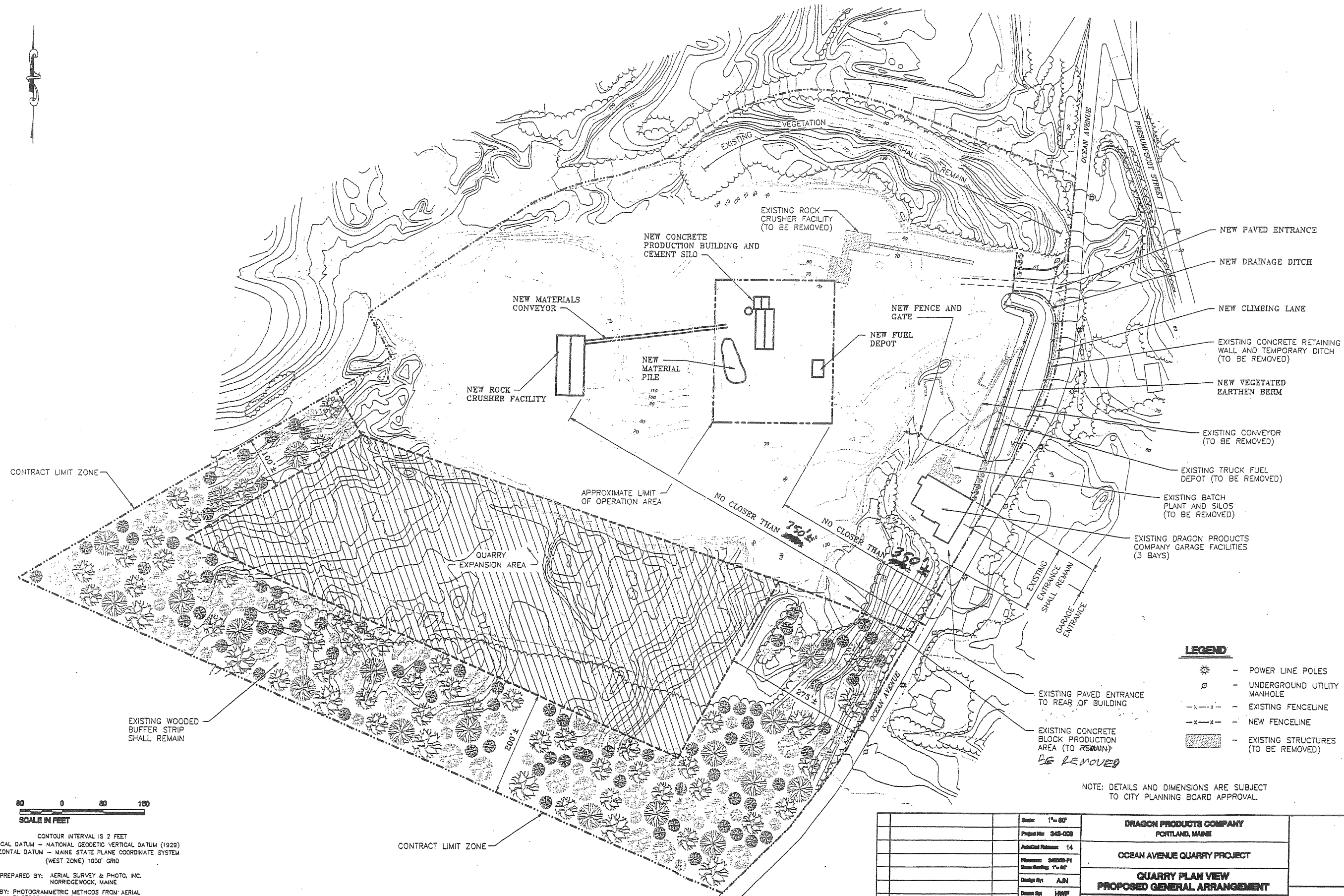


**LEGEND**

- 1 TRUCK GARAGE**
- 2 ENCLOSED CRUSHER**
- 3 BATCH PLANT AND SILOS**
- 4 AGGREGATE STOCK PILES**
- 5 TRUCK FUEL DEPOT**
- 6 ENTRANCE DRIVEWAY**
- 7 NEW RAMPING LANE**
- 8 ROADSIDE BUFFER ZONE**
- 9 RESEEDED FIELD AREA**







- LEGEND**
- ☼ - POWER LINE POLES
  - ⊙ - UNDERGROUND UTILITY MANHOLE
  - x-x- - EXISTING FENCELINE
  - x-x- - NEW FENCELINE
  - ▨ - EXISTING STRUCTURES (TO BE REMOVED)

NOTE: DETAILS AND DIMENSIONS ARE SUBJECT TO CITY PLANNING BOARD APPROVAL.



CONTOUR INTERVAL IS 2 FEET  
 VERTICAL DATUM - NATIONAL GEODETIC VERTICAL DATUM (1929)  
 HORIZONTAL DATUM - MAINE STATE PLANE COORDINATE SYSTEM (WEST ZONE) 1000' GRID

PREPARED BY: AERIAL SURVEY & PHOTO, INC.  
 NORRIDGEWOCK, MAINE  
 BY: PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED 4-28-93

Dragon Products Company Portland, Maine	
OCEAN AVENUE QUARRY PROJECT	
QUARRY PLAN VIEW PROPOSED GENERAL ARRANGEMENT	
75 Main St. P.O. Box 578 Pittsfield, Maine 04967 Telephone: (207) 487-3385 Fax: (207) 487-3124 www.kasociates.com	
No.	Revision
Date	Date
Drawn By: HWP	Checked By: A/JN
Design By: A/JN	Project No: 048-008
Plan Scale: 1" = 80'	Project Title: 048-008
Sheet Scale: 1" = 80'	Sheet No: 14
Scale: 1" = 80'	Sheet: 1" = 80'
Date: 04-03-03	Sheet: 1" = 80'

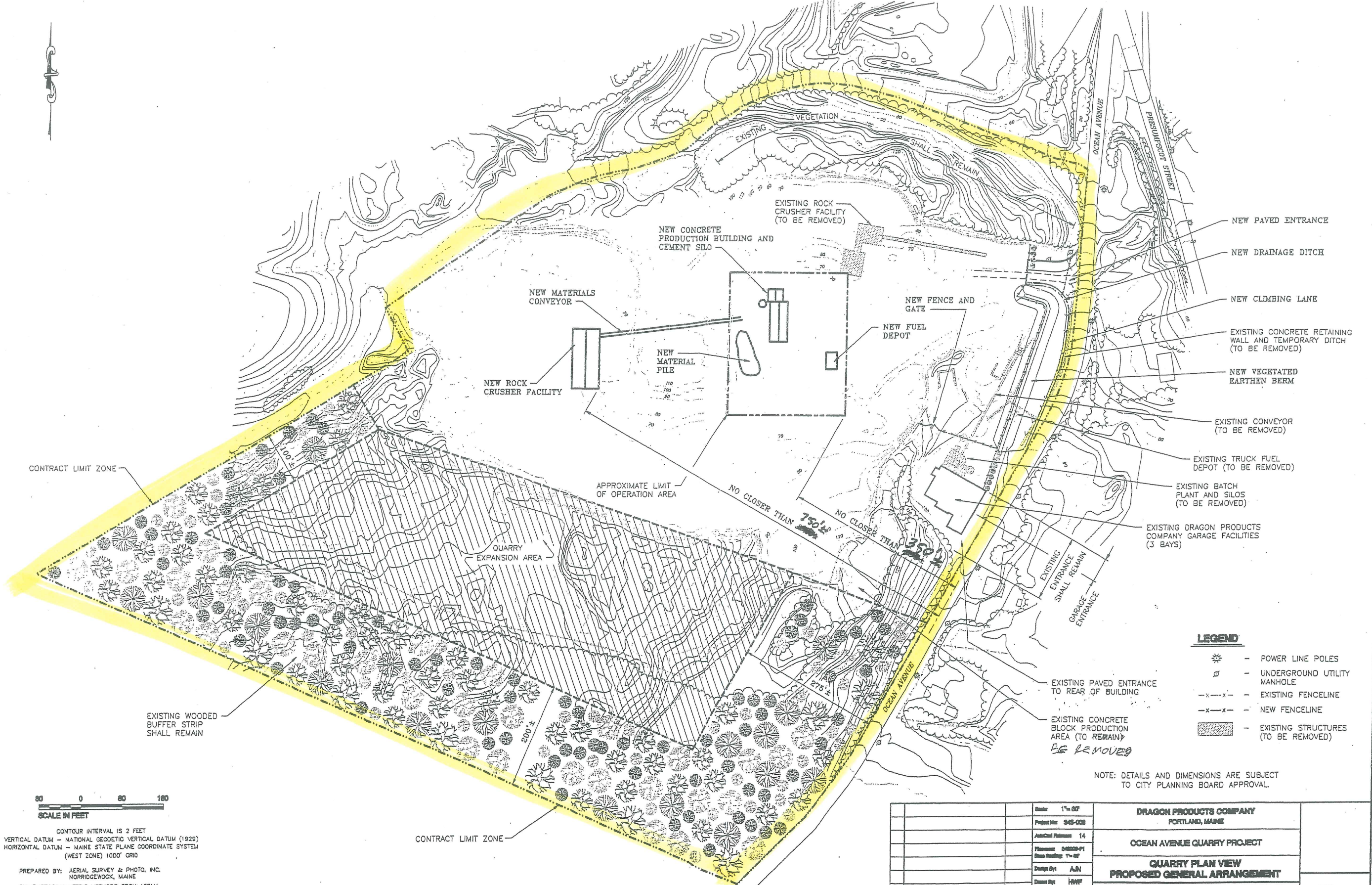
**F-1**











CONTRACT LIMIT ZONE

EXISTING WOODED BUFFER STRIP SHALL REMAIN

CONTRACT LIMIT ZONE

SCALE IN FEET  
0 80 160

CONTOUR INTERVAL IS 2 FEET  
VERTICAL DATUM - NATIONAL GEODETIC VERTICAL DATUM (1929)  
HORIZONTAL DATUM - MAINE STATE PLANE COORDINATE SYSTEM (WEST ZONE) 1000' GRID

PREPARED BY: AERIAL SURVEY & PHOTO, INC.  
NORRIDGEWOCK, MAINE  
BY: PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED 4-28-93

**LEGEND**

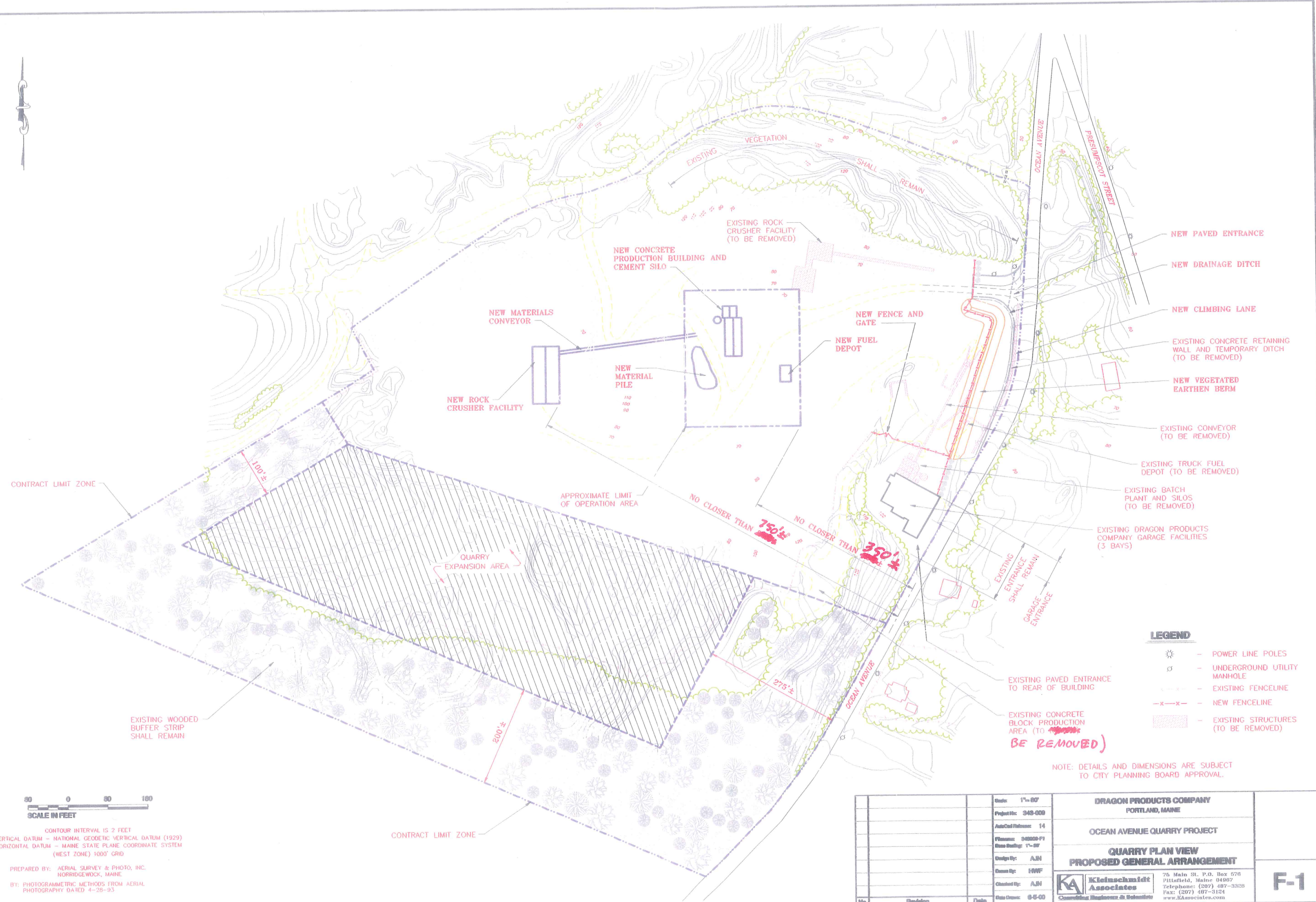
- POWER LINE POLES
- UNDERGROUND UTILITY MANHOLE
- EXISTING FENCELINE
- NEW FENCELINE
- EXISTING STRUCTURES (TO BE REMOVED)

EXISTING PAVED ENTRANCE TO REAR OF BUILDING  
EXISTING CONCRETE BLOCK PRODUCTION AREA (TO REMAIN)  
**BE REMOVED**

NOTE: DETAILS AND DIMENSIONS ARE SUBJECT TO CITY PLANNING BOARD APPROVAL.

Date: 11-07 Project No: 045-008 Associated Plans: 14 Filename: 040000-01 Date Issued: 11-07 Design By: A.J.N. Drawn By: H.W.P. Checked By: A.J.N. Date Drawn: 04-00		<b>DRAGON PRODUCTS COMPANY</b> PORTLAND, MAINE  <b>OCEAN AVENUE QUARRY PROJECT</b>  <b>QUARRY PLAN VIEW</b> <b>PROPOSED GENERAL ARRANGEMENT</b>	<b>F-1</b>
No.      Revision      Date		<b>Kleinschmidt Associates</b> Consulting Engineers & Scientists 75 Main St. P.O. Box 678 Pittsfield, Maine 04967 Telephone: (207) 487-3388 Fax: (207) 487-3124 www.klassociates.com	





- LEGEND**
- POWER LINE POLES
  - UNDERGROUND UTILITY MANHOLE
  - EXISTING FENCELINE
  - NEW FENCELINE
  - EXISTING STRUCTURES (TO BE REMOVED)

NOTE: DETAILS AND DIMENSIONS ARE SUBJECT TO CITY PLANNING BOARD APPROVAL.

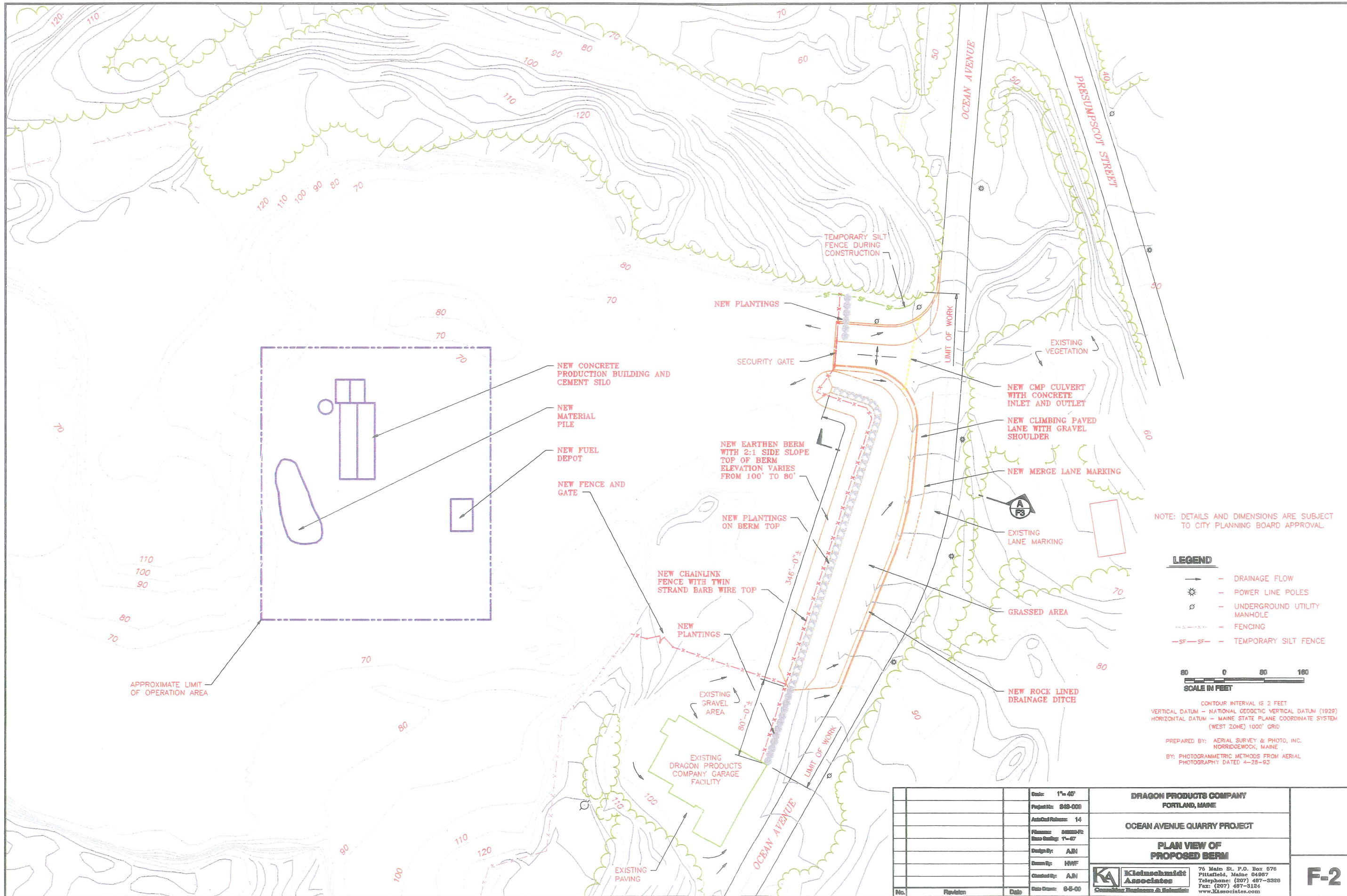


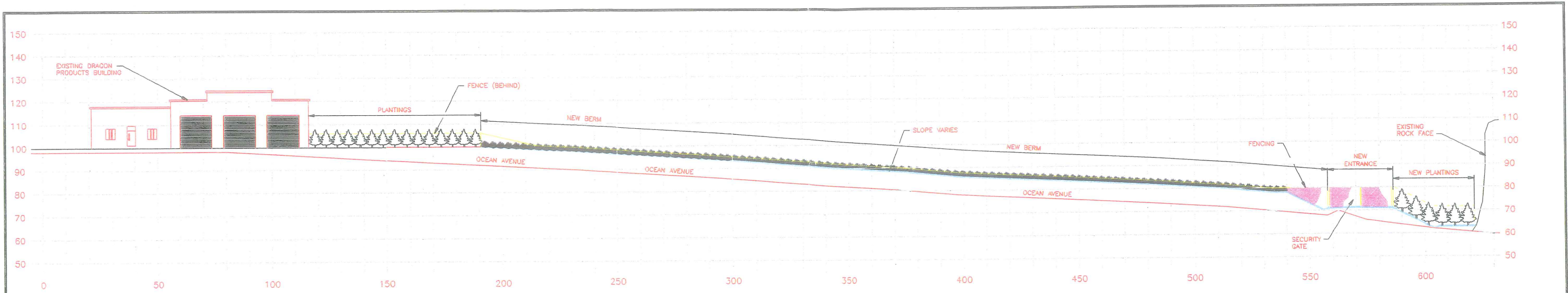
CONTOUR INTERVAL IS 2 FEET  
 VERTICAL DATUM - NATIONAL GEODETIC VERTICAL DATUM (1929)  
 HORIZONTAL DATUM - MAINE STATE PLANE COORDINATE SYSTEM  
 (WEST ZONE) 1000' GRID

PREPARED BY: AERIAL SURVEY & PHOTO, INC.  
 NORRIDGEWOCK, MAINE  
 BY: PHOTOGRAMMETRIC METHODS FROM AERIAL  
 PHOTOGRAPHY DATED 4-28-93

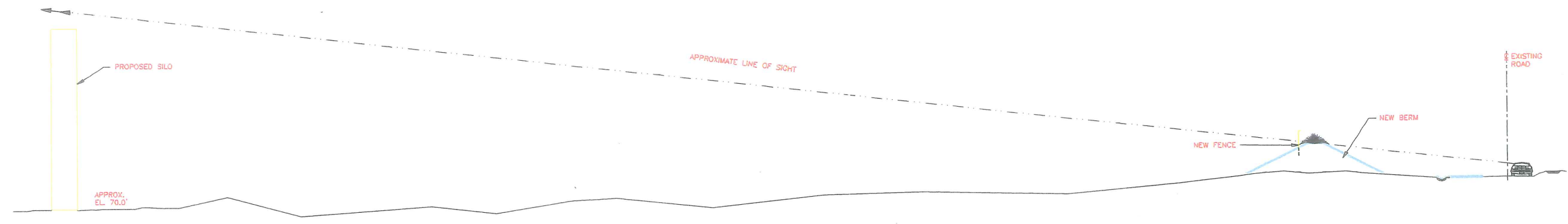
Scale: 1"=80' Project No: 348-000 AutoCad Release: 14 Filename: 348000-F1 Date: 04-28-93 Design By: AJN Drawn By: HWF Checked By: AJN Date Drawn: 04-05-00		<b>DRAGON PRODUCTS COMPANY</b> PORTLAND, MAINE  <b>OCEAN AVENUE QUARRY PROJECT</b>  <b>QUARRY PLAN VIEW</b> <b>PROPOSED GENERAL ARRANGEMENT</b>	<b>F-1</b>
No.    Revision    Date		76 Main St., P.O. Box 570 Pittsfield, Maine 04987 Telephone: (207) 487-3325 Fax: (207) 487-3124 www.KAAssociates.com	



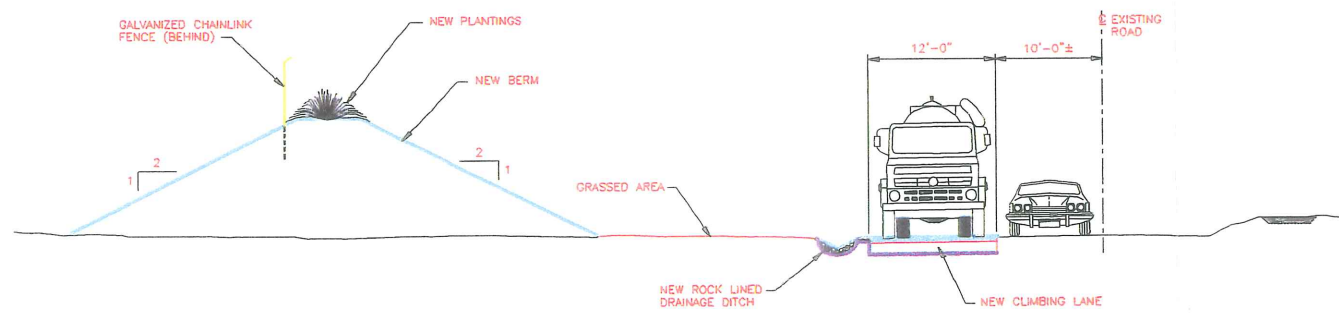




**LONGITUDINAL PROFILE**  
 1" = 20'  
 SCALE IN FEET



**LONGITUDINAL PROFILE - LINE OF SIGHT**  
 1" = 20'  
 SCALE IN FEET

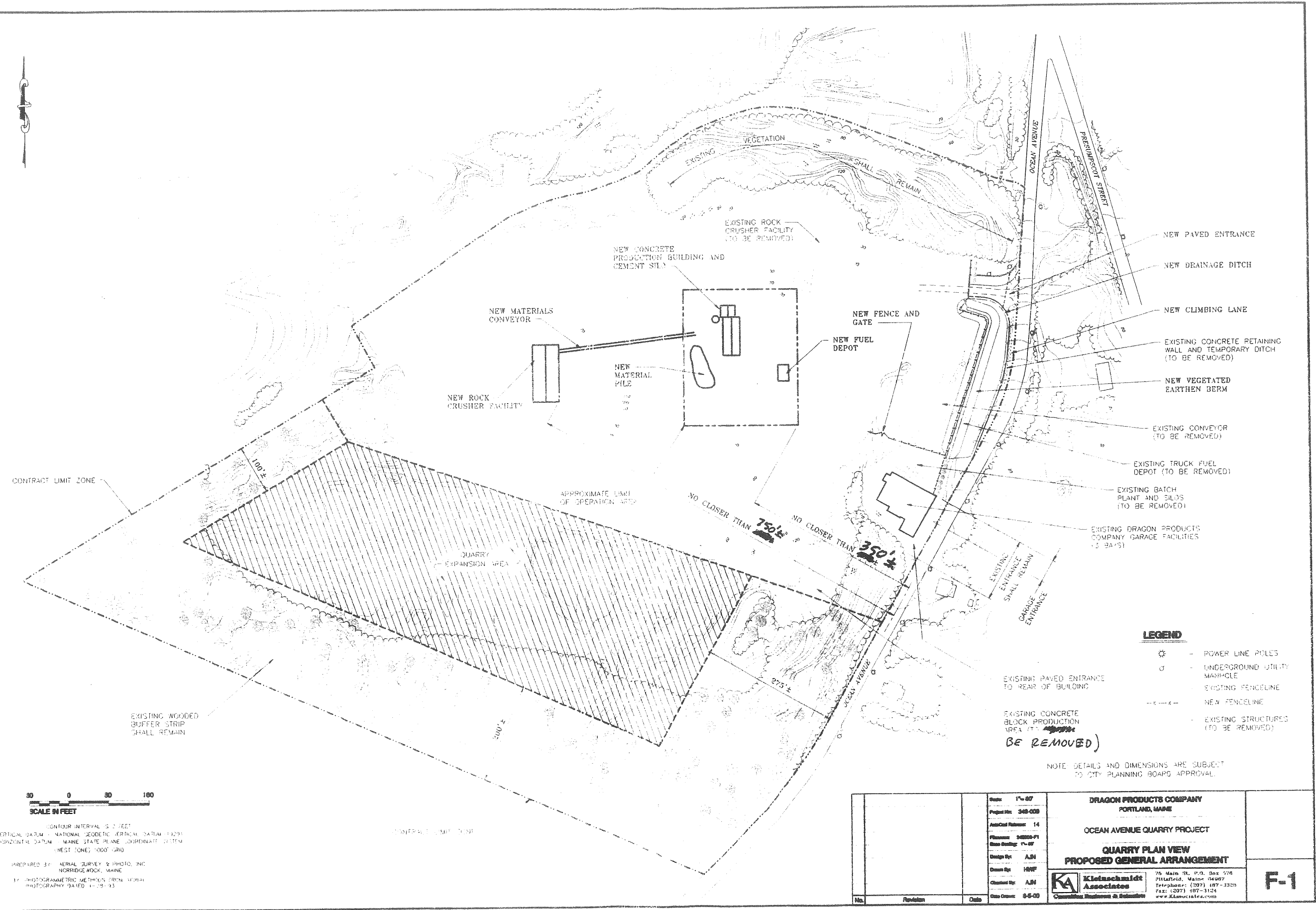


**SECTION A-3**  
 1/8" = 1'-0"  
 SCALE IN FEET

NOTE: DETAILS AND DIMENSIONS ARE SUBJECT TO CITY PLANNING BOARD APPROVAL

Date: 1-4-20 Project No: 348-000 AutoCad Release: 14 Plotname: 34800-FO Date Plotted: 1-27 Design By: A.J.N. Drawn By: H.W.F. Checked By: A.J.N. Date Printed: 0-5-00		<b>DRAGON PRODUCTS COMPANY</b> FORTLAND, MAINE <b>OCEAN AVENUE QUARRY PROJECT</b> <b>OCEAN AVENUE LONGITUDINAL AND CROSS SECTIONS</b>	<b>F-3</b>
No.      Revision      Date		<b>KleinSchmidt Associates</b> Consulting Engineers & Geologists 76 Main St. P.O. Box 576 Pittsfield, Maine 04857 Telephone: (207) 487-3328 Fax: (207) 487-3124 www.kasassociates.com	





CONTRACT LIMIT ZONE



CONTOUR INTERVAL IS 2 FEET  
 VERTICAL DATUM - NATIONAL GEODETIC VERTICAL DATUM 1929  
 HORIZONTAL DATUM - MAINE STATE PLANE COORDINATE SYSTEM  
 (WEST ZONE) 1000' GRID

PREPARED BY: AERIAL SURVEY & PHOTO, INC.  
 NORBRIDGE WOOD, MAINE  
 BY: PHOTOGRAMMETRIC METHODS FROM AERIAL  
 PHOTOGRAPHY DATED 11-28-93

CONTRACT LIMIT ZONE

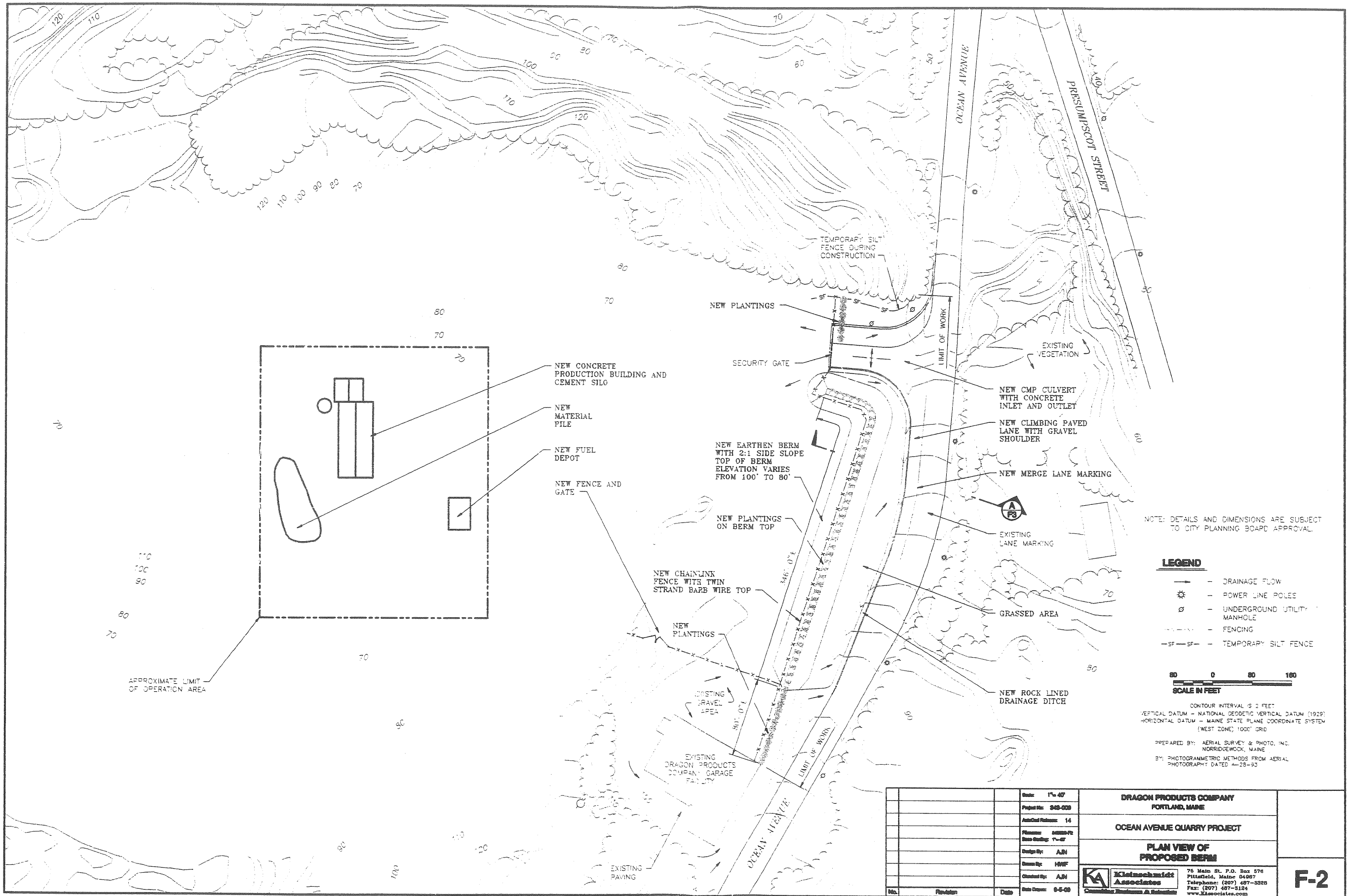
**LEGEND**

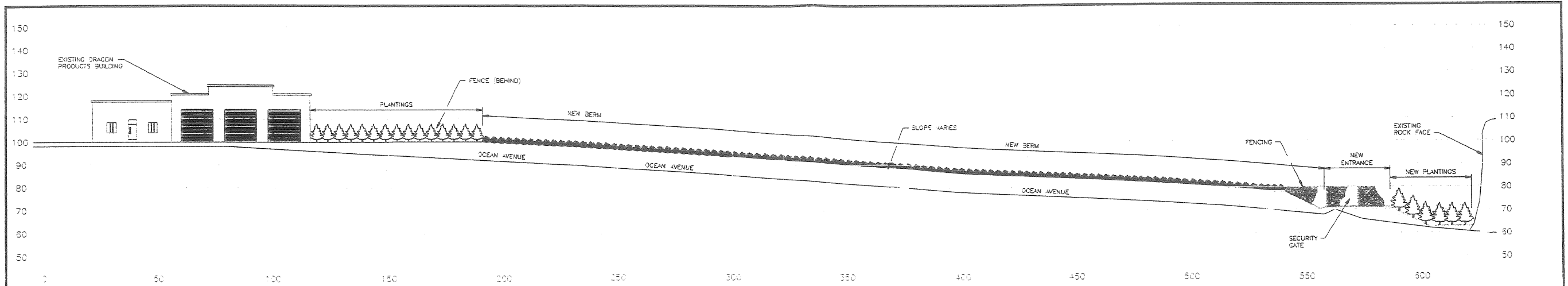
- ⊙ - POWER LINE POLES
- ⊕ - UNDERGROUND UTILITY MARKER
- - - - - EXISTING FENCELINE
- - - - - NEW FENCELINE
- - - - - EXISTING STRUCTURES (TO BE REMOVED)

EXISTING PAVED ENTRANCE TO REAR OF BUILDING  
 EXISTING CONCRETE BLOCK PRODUCTION AREA (TO BE REMOVED)

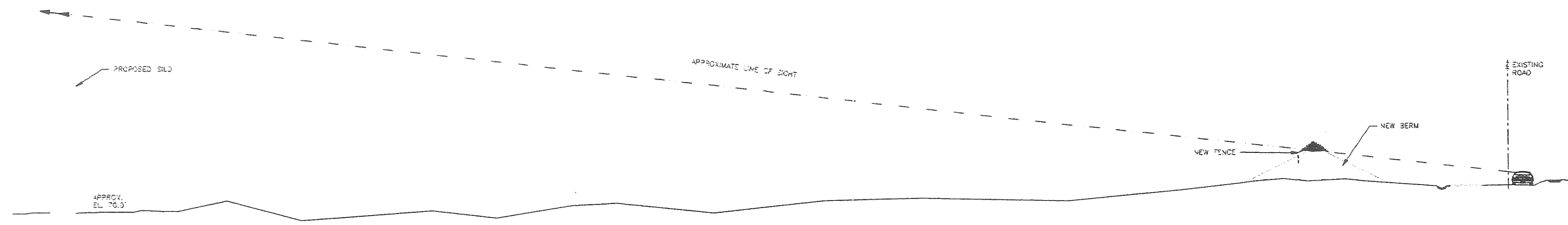
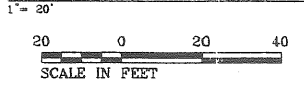
NOTE: DETAILS AND DIMENSIONS ARE SUBJECT TO CITY PLANNING BOARD APPROVAL.

Scale: 1"=50' Project No: 348-008 Assoc. Release: 14 Plan No: 348000-P1 Date Issued: 11-07 Design By: AJN Drawn By: HWF Checked By: AJN Date Closed: 04-00		<b>DRAGON PRODUCTS COMPANY</b> PORTLAND, MAINE  <b>OCEAN AVENUE QUARRY PROJECT</b>  <b>QUARRY PLAN VIEW</b> <b>PROPOSED GENERAL ARRANGEMENT</b>	<b>F-1</b>
No.      Revision      Date		75 Main St., P.O. Box 576 Pittsfield, Maine 04972 Telephone: (207) 487-3328 Fax: (207) 487-3124 www.kleinschmidt.com	

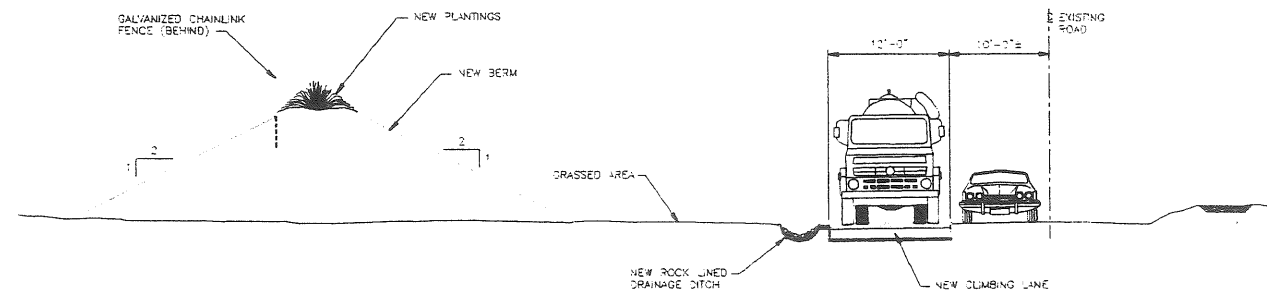




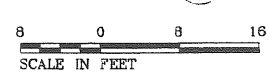
LONGITUDINAL PROFILE



LONGITUDINAL PROFILE - LINE OF SIGHT



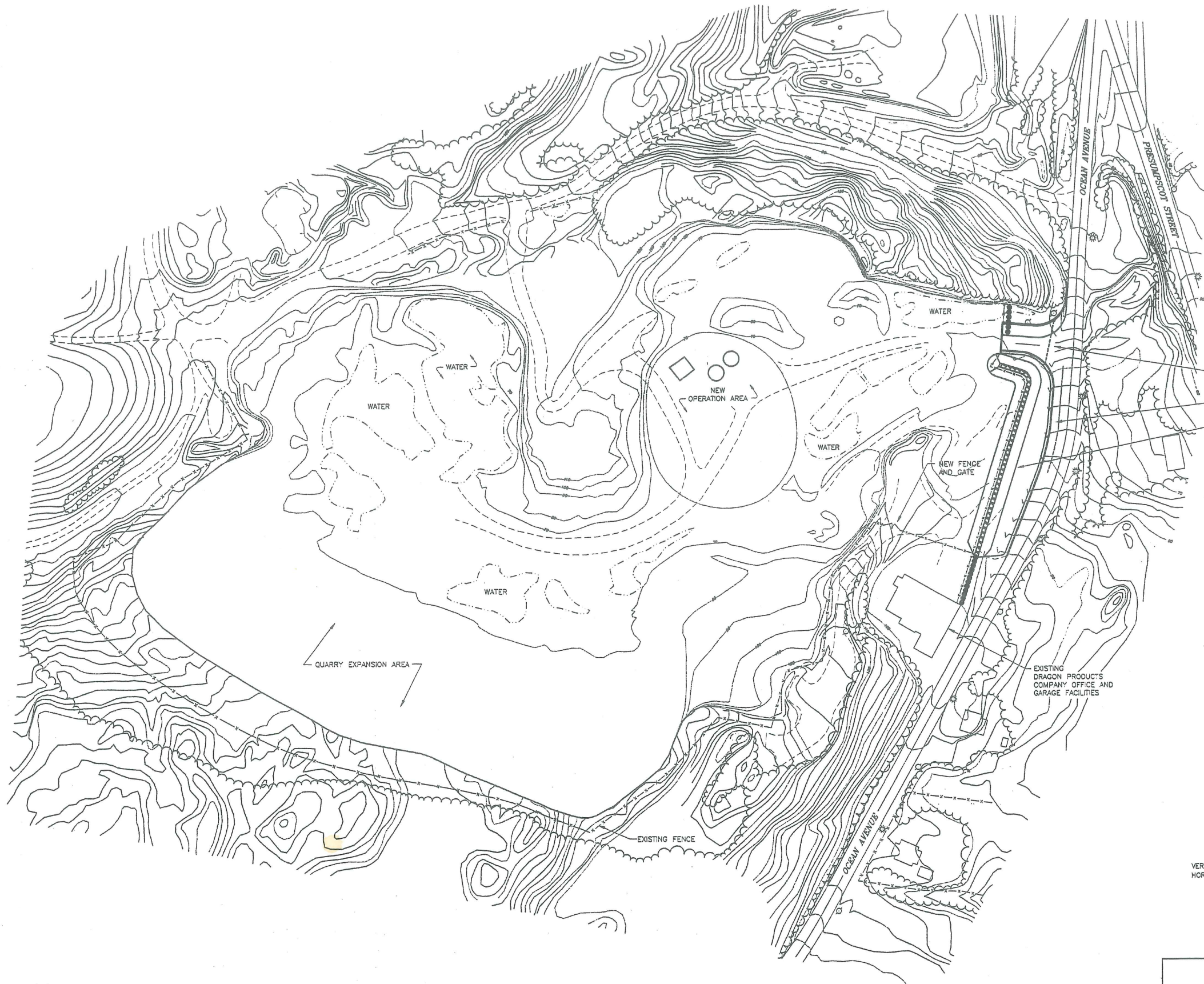
SECTION A



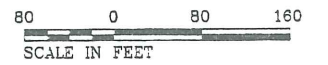
NOTE: DETAILS AND DIMENSIONS ARE SUBJECT TO CITY PLANNING BOARD APPROVAL

Scale: 1" = 20'		DRAGON PRODUCTS COMPANY PORTLAND, MAINE	
Project No: 348-008		OCEAN AVENUE QUARRY PROJECT	
Approved Release: 14		OCEAN AVENUE LONGITUDINAL AND CROSS SECTIONS	
Planner: 045528-00		75 Main St. P.O. Box 576 Pittsfield, Maine 04987 Telephone: (207) 487-3328 Fax: (207) 487-3124 www.kassociates.com	
Base Graph: 1'-0"			
Design By: AJN			
Drawn By: HWF			
Checked By: AJN		<b>F-3</b>	
Date Drawn: 6-6-00			
No.	Revision	Date	





NEW ENTRANCE  
 NEW MERGING LANE  
 NEW BERM



CONTOUR INTERVAL IS 2 FEET  
 VERTICAL DATUM - NATIONAL GEODETIC VERTICAL DATUM (1929)  
 HORIZONTAL DATUM - MAINE STATE PLANE COORDINATE SYSTEM  
 (WEST ZONE) 1000' GRID

PREPARED BY: AERIAL SURVEY & PHOTO, INC.  
 NORRIDGEWOCK, MAINE  
 BY: PHOTOGRAMMETRIC METHODS FROM AERIAL  
 PHOTOGRAPHY DATED 4-28-93

DRAGON PRODUCTS COMPANY  
 PORTLAND, MAINE

OCEAN AVENUE QUARRY PROJECT

PLAN VIEW OF PROPOSED  
 BERM

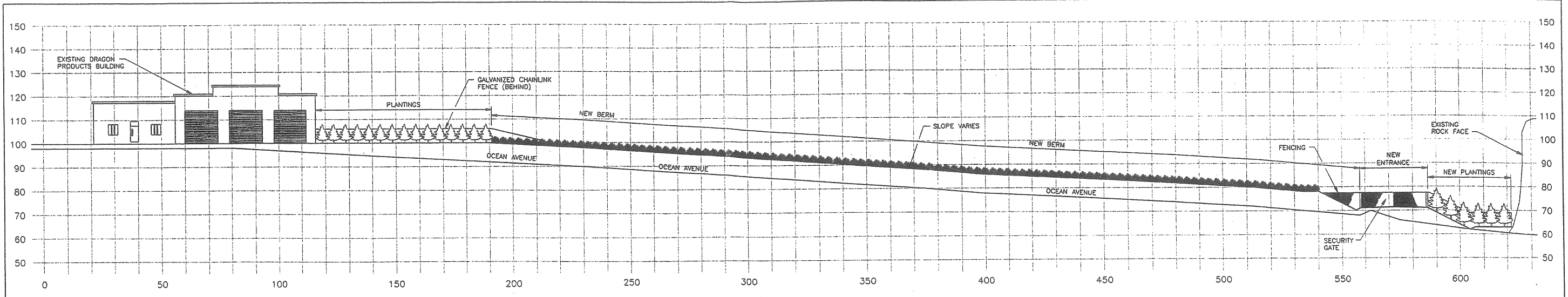
Date	Chkd.	Revision
1-3-00	HWP	Date: 1-3-00
1-18-00	AJN	Date: 1-18-00
		Date:

Scale: 1" = 80'

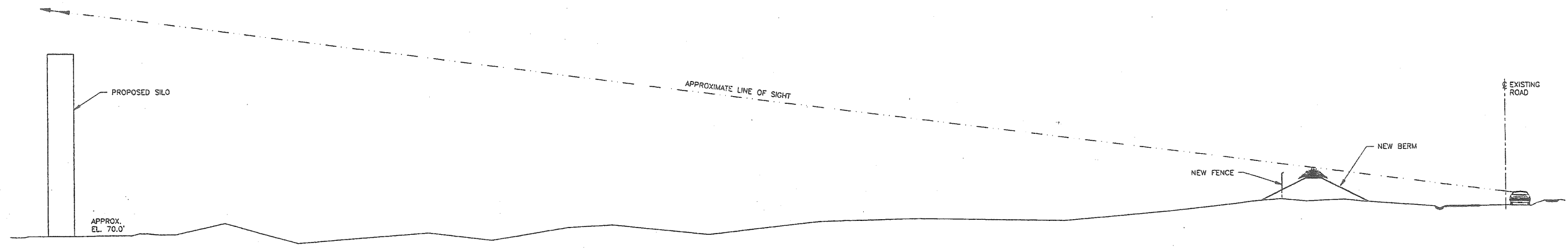
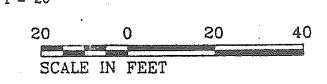
**KA** Kleinschmidt Associates  
 Consulting Engineers  
 and Scientists  
 Pittsfield, Maine

SHEET NO.  
 1  
 343-009

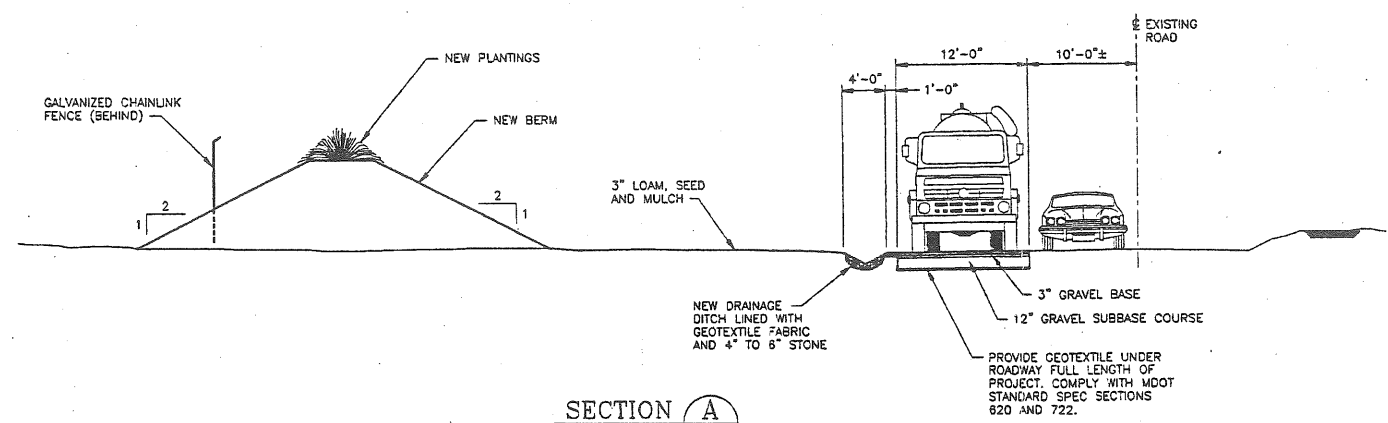
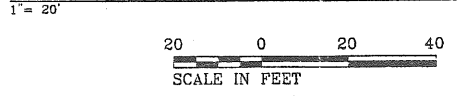
entire site: © 2000 Dragon Products, Inc.  
 © 2000 Dragon Products, Inc.



**LONGITUDINAL PROFILE**




**LONGITUDINAL PROFILE - LINE OF SIGHT**



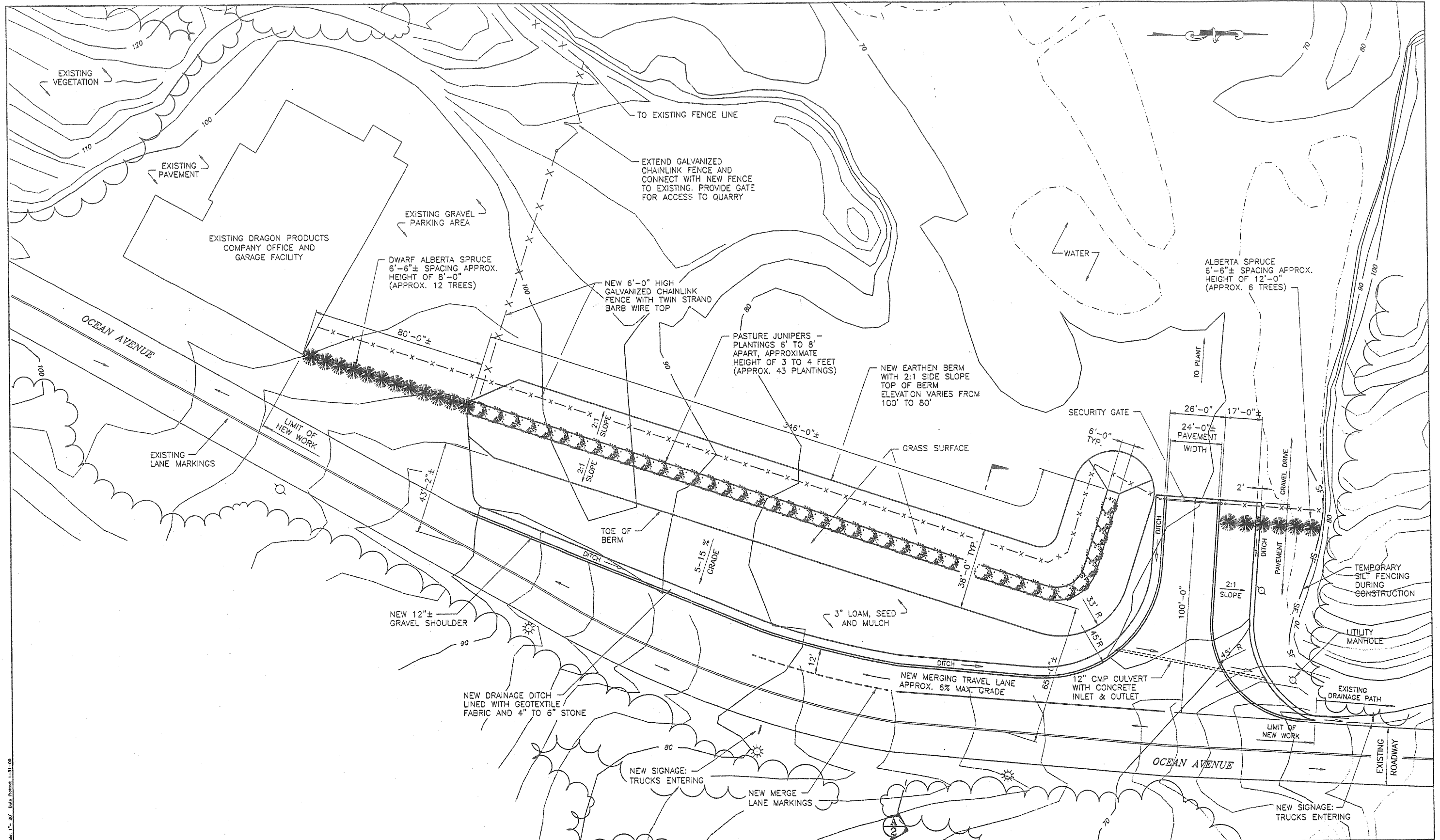
**SECTION A-3**



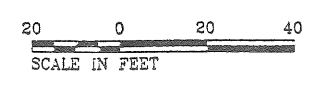
<p>DRAGON PRODUCTS COMPANY PORTLAND, MAINE</p>	
<p>OCEAN AVENUE QUARRY PROJECT</p>	
<p>OCEAN AVENUE LONGITUDINAL AND CROSS SECTIONS</p>	
<p>Date: _____</p>	<p>Chkd.: _____</p>
<p>Drawn by: <u>HWF</u></p>	<p>Date: <u>1-5-00</u></p>
<p>Designed by: <u>AJN</u></p>	<p>Date: <u>1-18-00</u></p>
<p>Checked by: _____</p>	<p>Date: _____</p>
<p>Scale: <u>1" = 20'</u></p>	<p>Revision: _____</p>
 <p>Kleinschmidt Associates Consulting Engineers and Scientists Pittsfield, Maine</p>	<p>SHEET NO. <u>2</u> 343-009</p>

3-15-00 10:50 AM 343-009 Ocean Avenue Quarry Project 1" = 20' Date Plotted: 1-21-00



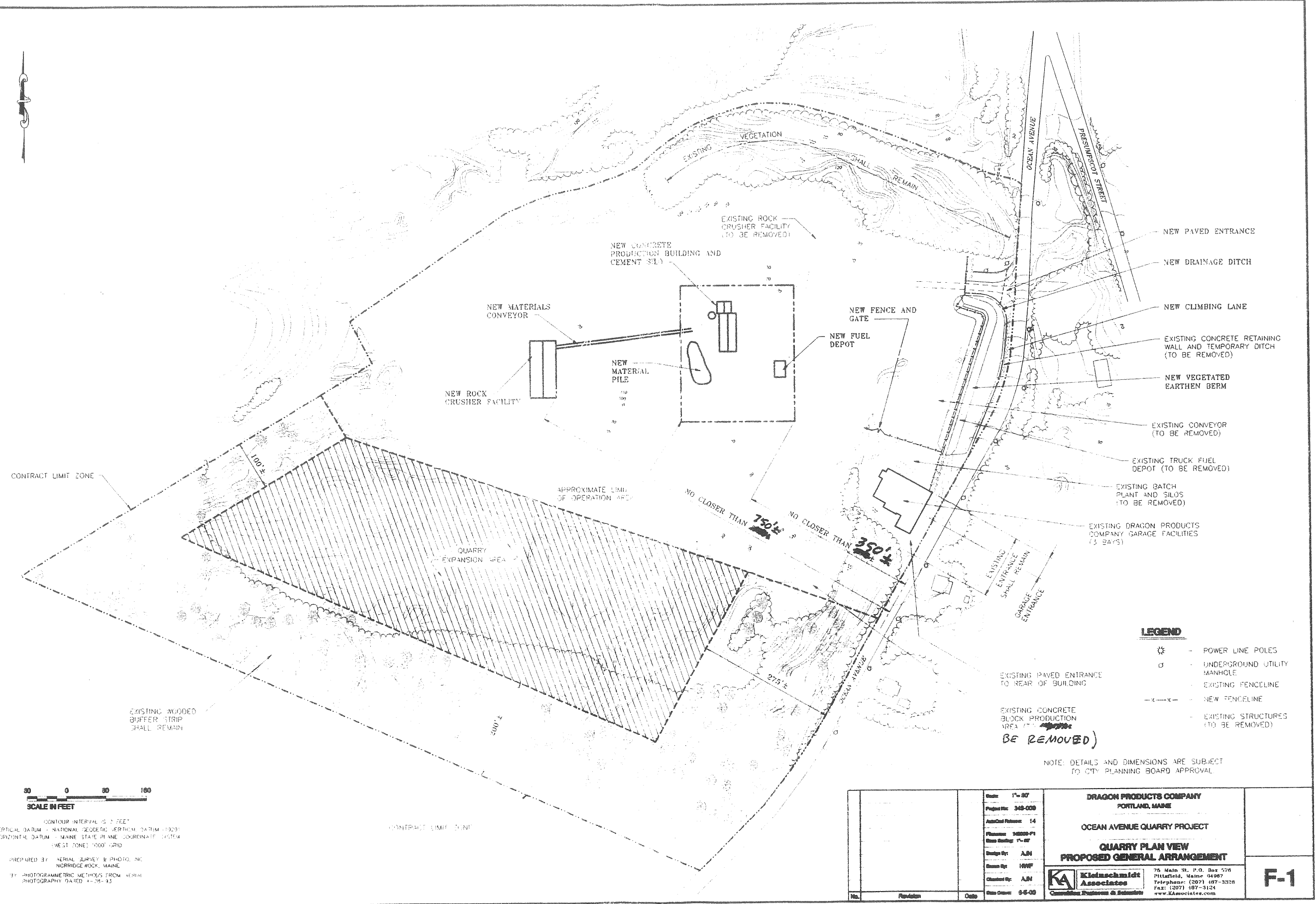


- LEGEND**
- DRAINAGE FLOW
  - POWER LINE POLES
  - UNDERGROUND UTILITY MANHOLE
  - FENCING
  - TEMPORARY SILT FENCE



<b>DRAGON PRODUCTS COMPANY</b> PORTLAND, MAINE		
OCEAN AVENUE QUARRY PROJECT		
<b>QUARRY ENTRANCE WITH BERM AND MERGING LANE</b>		
<b>Date</b>	<b>Chkd.</b>	<b>Revision</b>
Drawn by: <u>HWF</u>	Date: <u>1-7-00</u>	
Designed by: <u>AJN</u>	Date: <u>1-18-00</u>	
Checked by:	Date:	
Scale: 1" = 20'		
Kleinschmidt Associates Consulting Engineers and Scientists Pittsfield, Maine		SHEET NO. <b>3</b> 343-009

343-009-30-00, Plansheet, 343009-NonRoadway, Base Scale: 1" = 20', Date Printed: 1-31-00

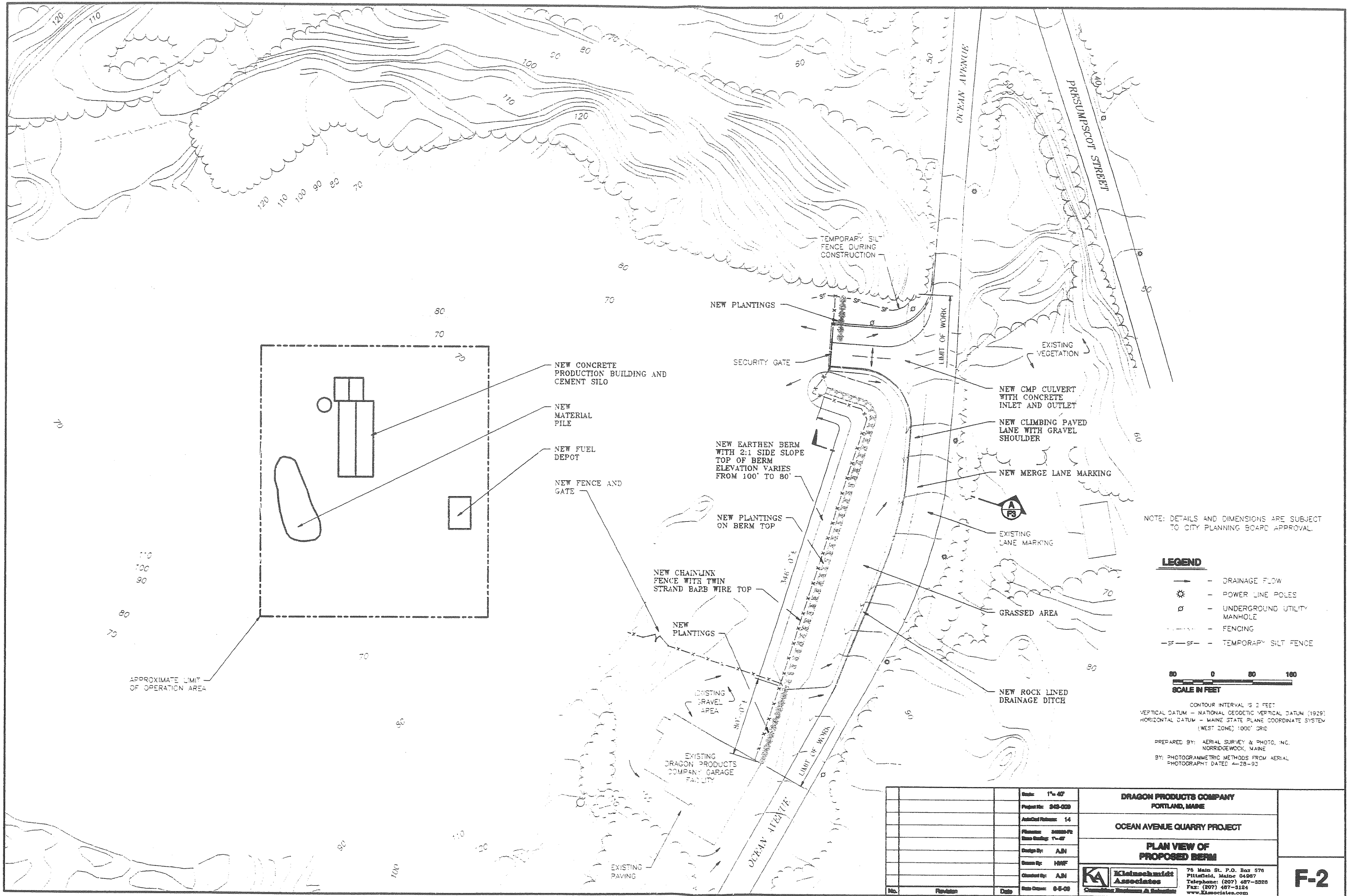


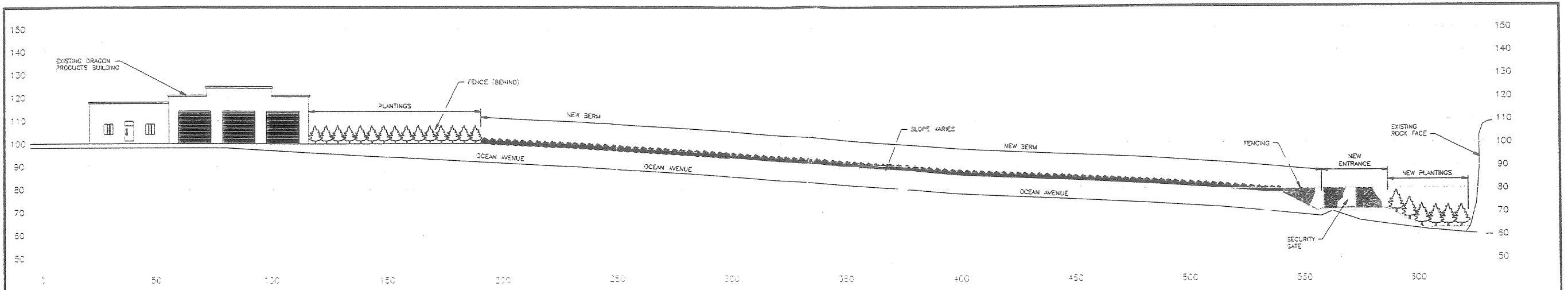
0 30 60 90 120 150  
**SCALE IN FEET**  
 CONTOUR INTERVAL IS 2 FEET  
 VERTICAL DATUM - NATIONAL GEODESIC VERTICAL DATUM (1929)  
 HORIZONTAL DATUM - MAINE STATE PLANE COORDINATE SYSTEM  
 (WEST ZONE) 1000' GRID  
 PREPARED BY: AERIAL SURVEY & PHOTO, INC.  
 NORRIDGE WOOD, MAINE  
 BY PHOTOGRAMMETRIC METHODS FROM AERIAL  
 PHOTOGRAPHY DATED 4-28-13

- LEGEND**
- ⊙ - POWER LINE POLES
  - ⊠ - UNDERGROUND UTILITY MANHOLE
  - - - - - EXISTING FENCELINE
  - x-x-x- NEW FENCELINE
  - - - - - EXISTING STRUCTURES (TO BE REMOVED)

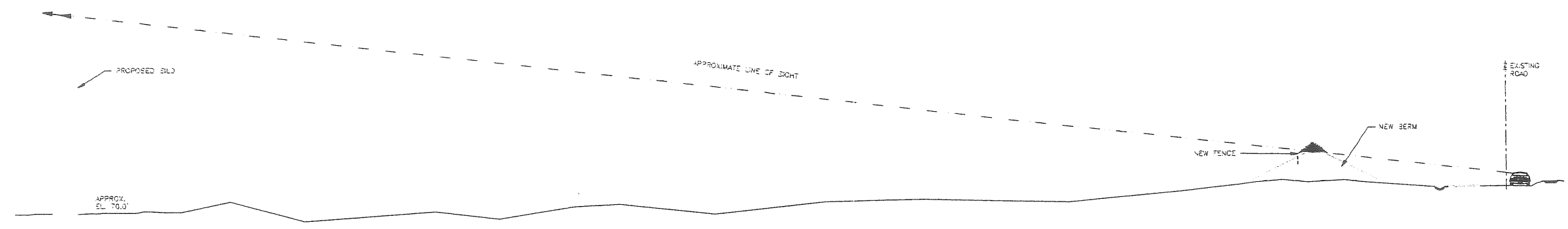
NOTE: DETAILS AND DIMENSIONS ARE SUBJECT TO CITY PLANNING BOARD APPROVAL

No. _____ Revision _____ Date _____		Scale: 1"=80' Project No: 348-020 AutoCad Release: 14 Plotting: 3/20/09-09 Sheet Number: 1 of 17 Design By: A.J.M. Drawn By: J.W.F. Checked By: A.J.M. Date Drawn: 04-08	<b>DRAGON PRODUCTS COMPANY</b> PORTLAND, MAINE  <b>OCEAN AVENUE QUARRY PROJECT</b>  <b>QUARRY PLAN VIEW</b> <b>PROPOSED GENERAL ARRANGEMENT</b>	<b>F-1</b>
75 Main St. P.O. Box 576 Pittsfield, Maine 04987 Telephone: (207) 487-3328 Fax: (207) 487-3124 www.KAassociates.com		<b>KA Kleinschmidt Associates</b> Consulting Engineers & Architects		

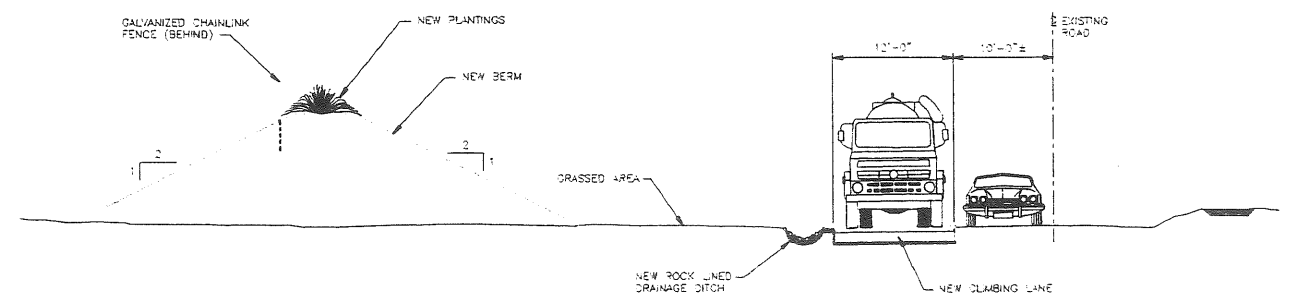




**LONGITUDINAL PROFILE**  
 1" = 20'  
 SCALE IN FEET



**LONGITUDINAL PROFILE - LINE OF SIGHT**  
 1" = 20'  
 SCALE IN FEET

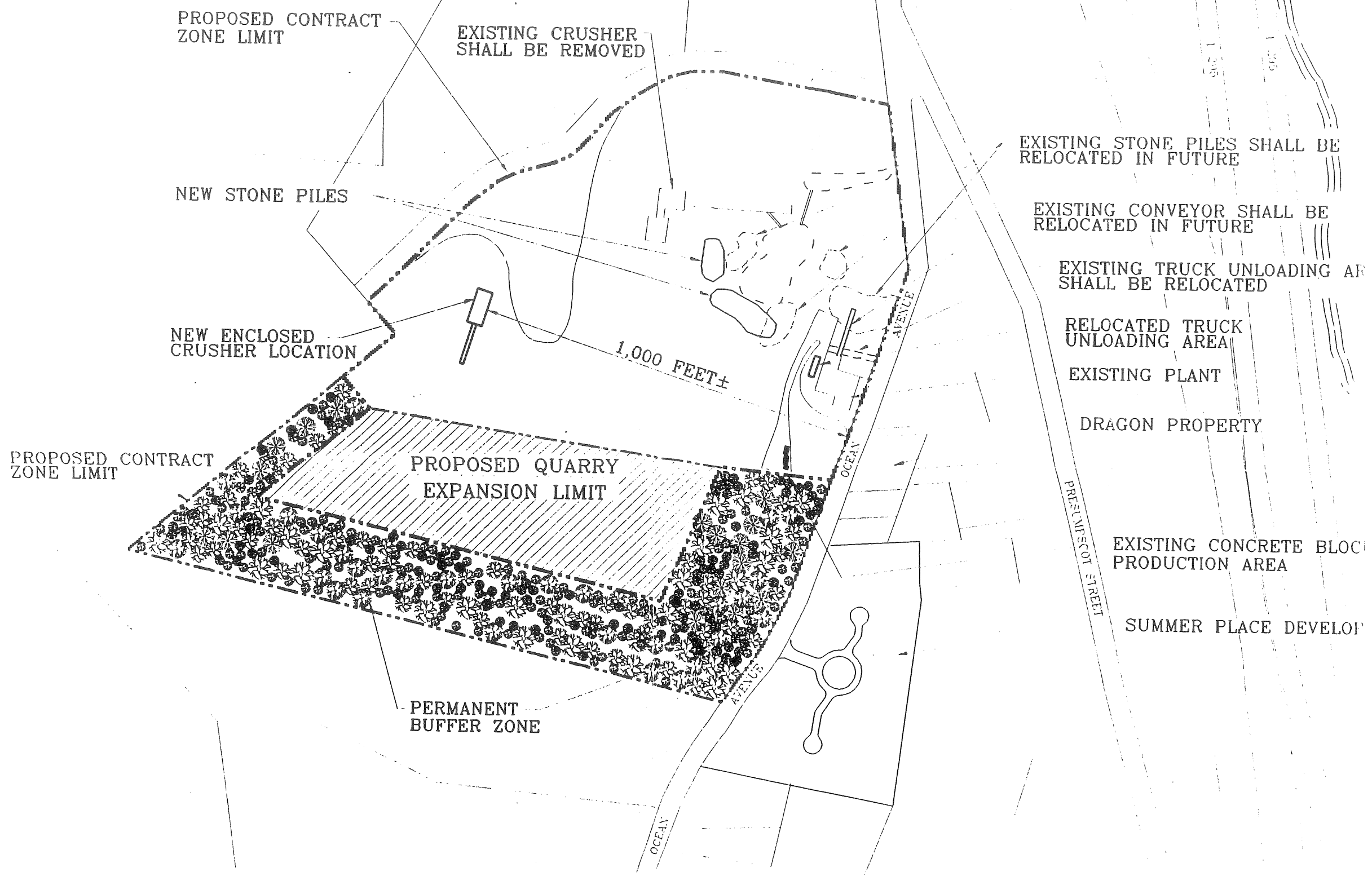


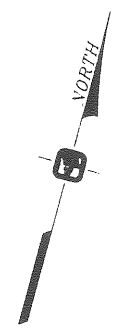
**SECTION A**  
 1/8" = 1'-0"  
 SCALE IN FEET

NOTE: DETAILS AND DIMENSIONS ARE SUBJECT TO CITY PLANNING BOARD APPROVAL

Scale: 1" = 20'		<b>DRAGON PRODUCTS COMPANY</b> PORTLAND, MAINE	<b>F-3</b>
Project No: 348-009			
Attached Sheets: 14		<b>OCEAN AVENUE QUARRY PROJECT</b>	
Planner: 2/2008-PB		<b>OCEAN AVENUE LONGITUDINAL AND CROSS SECTIONS</b>	
Sheet Number: F-03		76 Main St. P.O. Box 576 Pittsfield, Maine 04907 Telephone: (207) 487-3328 Fax: (207) 487-3124 www.KAassociates.com	
Design By: A.J.N.	Drawn By: H.W.F.		
Checked By: A.J.N.	Date: 8-6-08		
No.	Revision	Date	







RECREATION  
OPEN SPACE ZONING

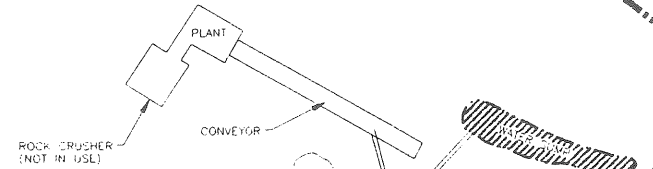
100' WIDE WOODED  
BUFFER STRIP

200' WIDE EXISTING WOODED  
BUFFER STRIP TO REMAIN -  
(NO CHANGE FROM R3 ZONING)

PROPOSED DRAGON  
INDUSTRIAL ZONE

N8

N7



EXISTING  
QUARRY

PROPOSED DRAGON  
INDUSTRIAL ZONE

N3

PROPOSED  
EXPANSION

PROPOSED DRAGON  
INDUSTRIAL ZONE

N6



CONCRETE  
PLANT

PLANT  
ENTRANCE

B1/N1

B2/N2

N4

SUBDIVISION

AVENUE

OCEAN

LEGEND

● N4 SOUND LEVEL MONITORING LOCATION POINTS

NOTES:

1. MONITORING EXISTING SOUND LEVELS LOCATION PLAN WAS PREPARED FROM A 1"=100' SCALE PLAN OF THE SITE ENTITLED "PROPOSED DRAGON INDUSTRIAL ZONE," PREPARED BY KLEINSCHMIDT ASSOCIATES CONSULTING ENGINEERS, DATED 2/18/97, REVISED 9/97.

2. THE LOCATIONS OF MONITORING POINTS HAVE BEEN APPROXIMATELY DETERMINED IN THE FIELD IN RELATION TO EXISTING SITE FEATURES.

# SOUND LEVELS READING LOCATIONS

MONITORING EXISTING SOUND LEVELS  
DRAGON PRODUCTS COMPANY  
OCEAN AVENUE QUARRY  
prepared for  
KLEINSCHMIDT ASSOCIATES

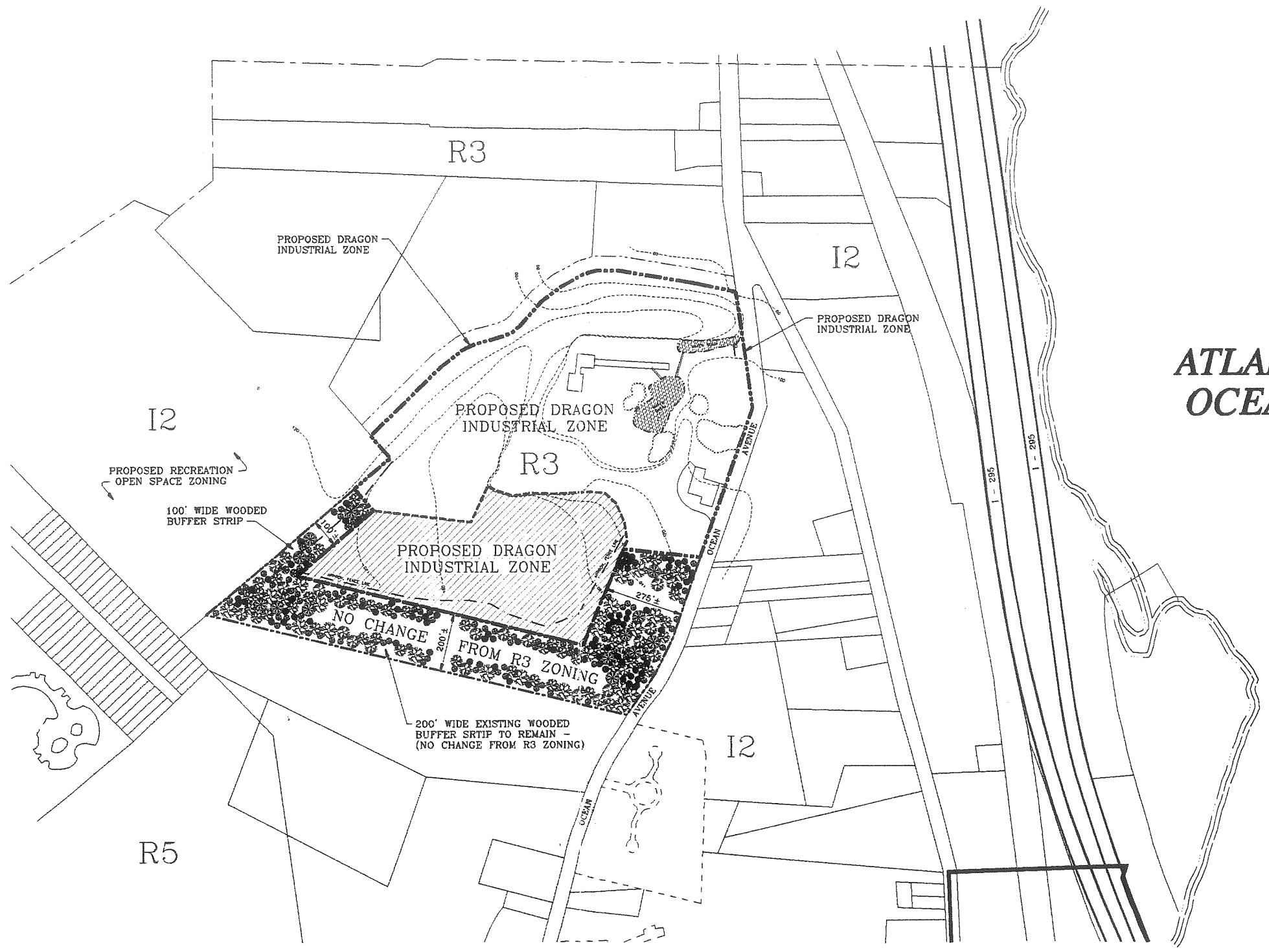
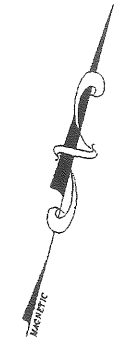


**Robert G. Gerber, Inc.**  
a Jacques Whitford Company  
Consulting Engineers and Environmental Scientists

DRAWN BY:	CEM	DATE:	11/20/97
APPROVED BY:		SCALE:	AS SHOWN
PROJECT NUMBER:	97016	FIGURE NUMBER:	1

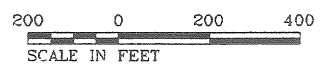


CSW

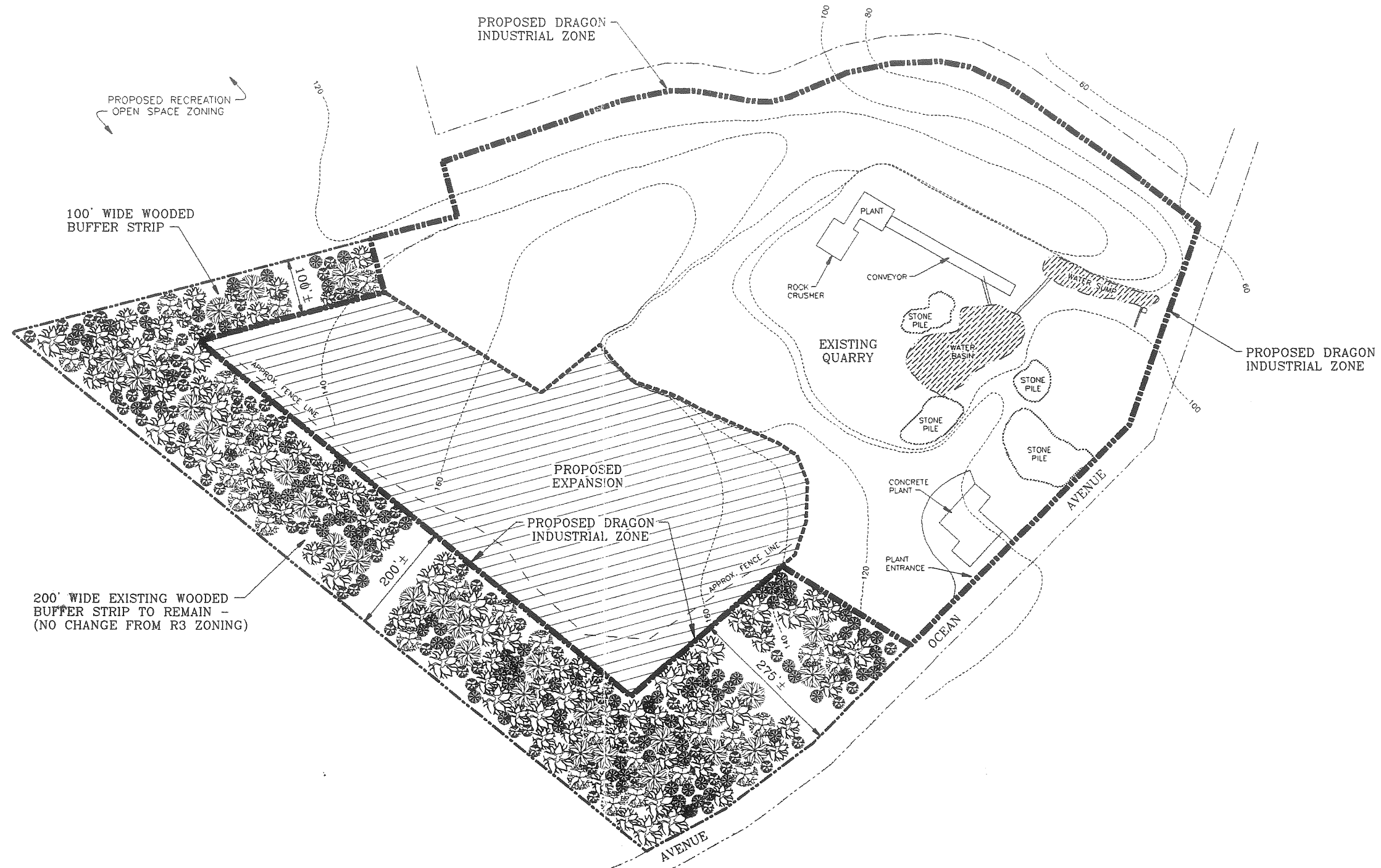


**ATLANTIC  
OCEAN**

15-000-01-00: file name: 112007.dwg, user: JAC, date: 11-20-97



DRAGON PRODUCTS COMPANY PORTLAND, MAINE		
OCEAN AVENUE QUARRY		
PROPOSED DRAGON INDUSTRIAL ZONE		
Kleinschmidt Associates Consulting Engineers Pittsfield, Maine		SHEET NO. 2-2 343-009-001
Date	Chkd.	Revision
Drawn by: HWP	Date: 2-18-97	
Designed by:	Date:	
Checked by:	Date:	
Scale: 1" = 200'		



100' WIDE WOODED BUFFER STRIP

200' WIDE EXISTING WOODED BUFFER STRIP TO REMAIN - (NO CHANGE FROM R3 ZONING)

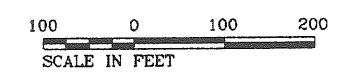
PROPOSED DRAGON INDUSTRIAL ZONE

PROPOSED EXPANSION

PROPOSED DRAGON INDUSTRIAL ZONE

PROPOSED DRAGON INDUSTRIAL ZONE

SUBDIVISION



DRAGON PRODUCTS COMPANY  
PORTLAND, MAINE

OCEAN AVENUE QUARRY

PROPOSED DRAGON INDUSTRIAL ZONE

Date	Chkd.	Revision
Drawn by: HWP		Date: 2-18-97
Designed by:		Date:
Checked by:		Date:
Scale: 1" = 100'		



Kleinschmidt Associates  
Consulting Engineers  
Pittsfield, Maine

SHEET NO.  
1-2  
343-009-01

343-009-01-01; file name: 343009.dwg; plot date: 9/1/97; 48x64; printer: 9-1-97



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KA 343-009 1/98



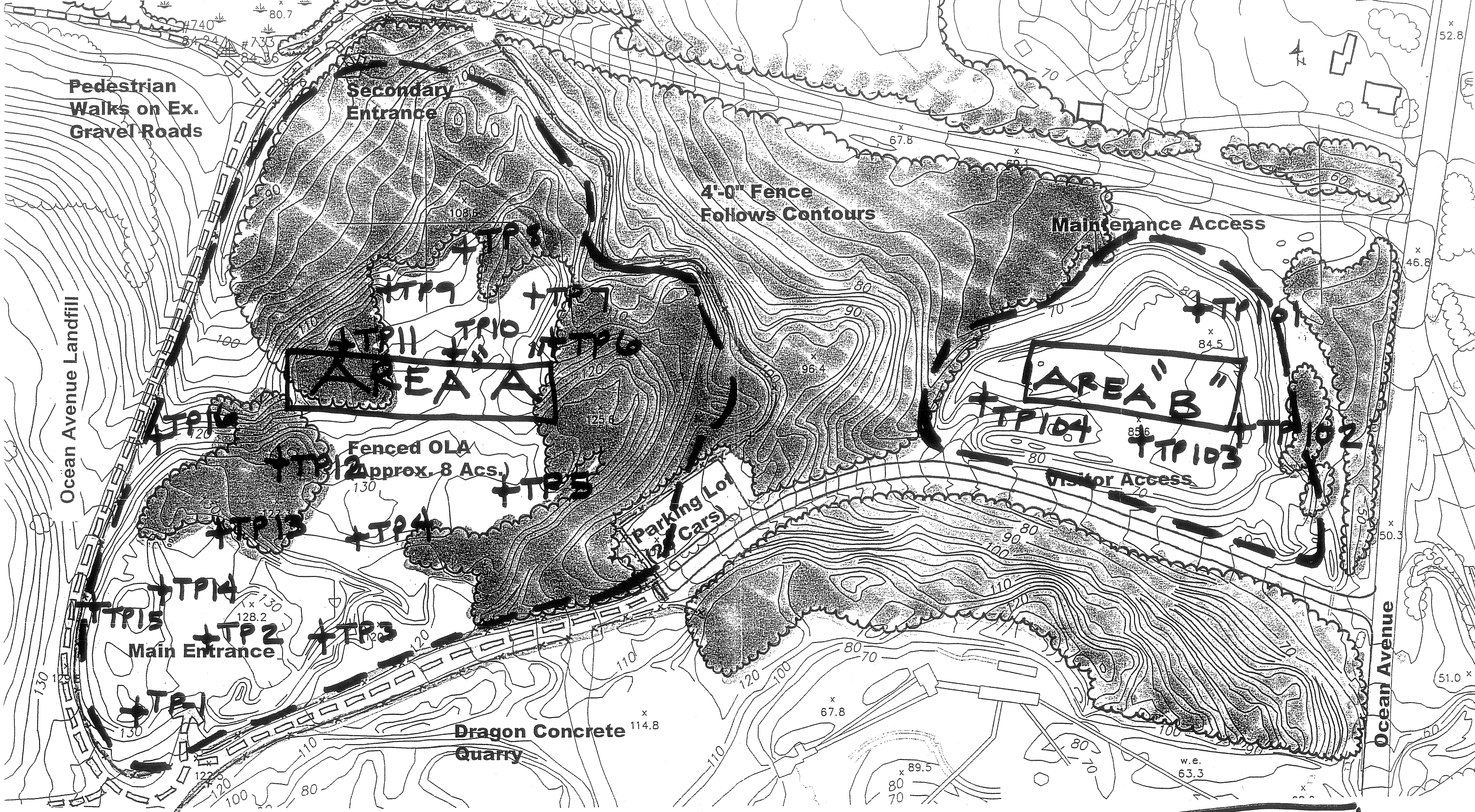
DRAGON PRODUCTS COMPANY PORTLAND, MAINE			
OCEAN AVENUE QUARRY			
PROPOSED DRAGON INDUSTRIAL ZONE			
Date: 1-06-98 Chkd.: AEH		REVISION REVISION REVISION	
Drawn by: HWP Date: 2-18-97		SHEET NO. 2-2	
Designed by: _____ Date: _____		Kleinschmidt Associates Consulting Engineers Pittsfield, Maine	
Checked by: _____ Date: _____		343-009-001	
Scale: 1" = 200'			

con









Pedestrian Walks on Ex. Gravel Roads

Secondary Entrance

4'-0" Fence Follows Contours

Maintenance Access

AREA A

AREA B

Fenced OLA (Approx. 8 Acs.)

Parking Lot (22 Cars)

Visitor Access

Main Entrance

Dragon Concrete Quarry

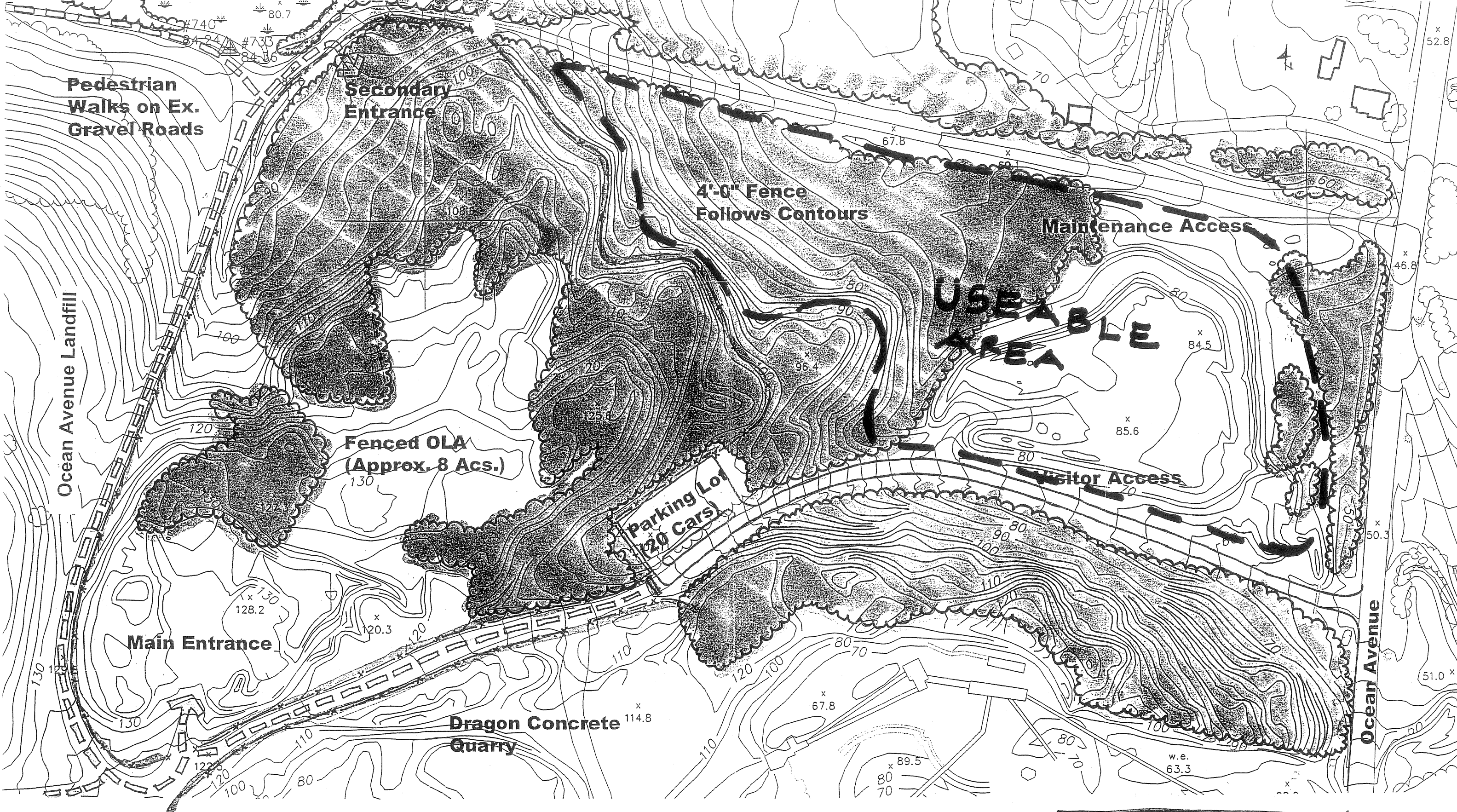
**EXHIBIT A**

Portland Parks and Recreation  
OLA Committee

1" = 100' ±

**Ocean Avenue Landfill – Off-Leash Area**  
Concept Plan - July 2002  
Scale 1" = 100'-0"





**Ocean Avenue Landfill – Off-Leash Area**  
 Concept Plan - July 2002  
 Scale 1" = 100'-0"

**EXHIBIT B**

Portland Parks and Recreation  
 OLA Committee

1" = 100' ±