



CONTINENTAL PLACER INC.

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(603) 524-0811

www.continentalplacer.com

February 18, 2015

Mr. Brian Emmons
T-Buck Construction, Inc.
249 Merrow Road
Auburn, ME 04210

RE: Construction Vibration Monitoring Plan – Vermont Agency of Transportation Project (VTrans) #BRF 0269 (13), Burke, VT.

Dear Mr. Emmons:

The following Construction Vibration Monitoring Plan (Plan) has been assembled in accordance with VTrans' specifications for the subject project. Continental Placer Inc.'s (CPI) work shall consist of preparing this Plan, completing pre-construction surveys on structures with 150 feet of the project, monitoring construction related vibrations and setting vibration limits to avoid damaging existing nearby structures, properties and utilities located on or near this project. Sources of construction related vibrations which are covered by this specification include sheet pile driving, compaction equipment and other construction activities as required.

Engineering/Vibration Consultant Qualifications– CPI has been working on construction projects for the past 25+ years as a qualified Vibration Consultant. Please see the attached resumes of key personnel.

Description of monitoring equipment – CPI will be using Instantel seismographs to monitor vibration producing construction activities. The seismographs comply with the following requirements:

- (a) Measure, display, and provide a permanent record on a strip chart of particle velocity components.
- (b) Measure the three mutually perpendicular components of particle velocity in directions vertical, radial, and perpendicular to the vibration source.
- (c) Have a velocity frequency response of 2 Hz to 150 Hz, and be capable of measuring PPV of up to 10 in/s (250 mm/s).
- (d) All seismographs used on the project shall display the date of the most recent calibration.
- (e) Calibration must have been performed within the last 12 months and must be performed to a standard traceable to the National Institute of Standards and Technology.

Please see the attached specification sheet and calibration certificates. If different or additional seismographs are used on this project, we will provide the up-to-date calibration certificates to you. Locations of the seismographs will be determined in the field and be based on our findings during the pre-construction surveys.

Recommendations for vibration limits – The maximum peak particle velocity (PPV) of ground vibration, at any of the above-ground, residential or commercial structures shall not exceed the following limits:

<u>Type of Structure</u>	Maximum PPV, in/s (mm /s)	
	Frequencies Below 40 Hz	Frequencies 40 Hz or Greater
Modern Homes- Drywall Interiors	0.75 (19)	2.0 (50)
Older Homes – Plaster Interiors	0.50 (13)	2.0 (50)

Recommendations for pre- construction and d post construction surveys – CPI recommends that pre-construction surveys be offered to property owners within 150 feet of the project work. The findings of the surveys will determine where, if at all, to install crack monitoring gauges. Post construction surveys shall be provided to those property owners who feel their property has been negatively affected by the construction activities.

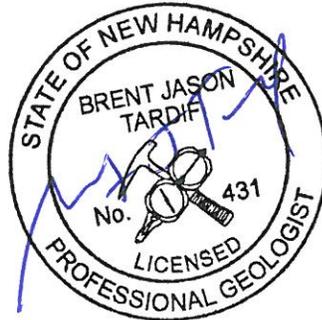
Recommendations to protect adjacent facilities - CPI expects that the proposed construction activity can be reasonably implemented without exceeding vibration limits and, therefore, has no further recommendations to protect adjacent structures.

Thank you for this opportunity to work with you. If we can be further assistance in this or any other matter, please do not hesitate to call.

Respectfully Submitted,
CONTINENTAL PLACER INC.

Brent J. Tardif, PG
President

Attached



RESUMES OF KEY PERSONNEL

BRENT J. TARDIF, PG, PRESIDENT/SENIOR GEOLOGIST

2 Winners Circle • Albany, New York 12205

(518) 458-9203 ext 308 • btardif@continentalplacer.com

AREAS OF EXPERTISE

Blasting Consulting and Vibration Control: Mr. Tardif has provided expert expertise in blast consultation and vibration control services for major highway construction and related projects. A sample of some of the more unique projects completed by Mr. Tardif include a vent shaft raise for an underground mine and several projects that included blasting adjacent to a fully charged natural gas transmission line.

Additionally, Mr. Tardif has provided blasting consultation for a taking at a six million ton per year quarry. Tasks included blast design within 150 feet of inhabited dwellings and multi-deck blasting for faces 140 feet in height.

Throughout his career Mr. Tardif has conducted several hundred pre-blast surveys and post-blast inspections throughout New England and the northeast.

Reserves Valuations: Many acquisitions require that a valuation be made of the business to be purchased. Mr. Tardif has conducted many valuations on properties throughout the U.S. of several large aggregate material producers in New England, the Mid-Atlantic States and the Midwest. Responsibilities included certification of reserves, market analyses, environmental assessments and net present value/discounted cash flow calculations. Tardif has also performed numerous sand and gravel evaluations throughout New England and the northeast.

Prepared a study for the New England Governor's Conference on the Supply and Demand for Construction Aggregates throughout New England.

Permit Preparation and Regulatory Compliance: Mr. Tardif has prepared numerous federal, state and local permits for aggregate quarry projects including comprehensive Title V, Clean Air Act Amendment compliance review inventories and testing throughout New England and the northeast. Other permits for such clients have included stormwater permits, spill prevention plans and wetland permits. Mr. Tardif has designed reclamation plans for secondary uses to maximize profit and concurrent reclamation schemes to lessen restoration costs.

Exploration and Development: For over 20 years Tardif has been involved in the search for, evaluation and development of sand, gravel and bedrock deposits. These projects have been throughout the eastern and New England portions of the United States. Such projects involve expertise not only in geology but also involve an assessment of the business economics, marketing strategies, permitting and processing. Mr. Tardif has conducted



numerous core-drilling programs to quantify reserves; he has developed material testing programs and planned sequencing and mine layouts. These projects have been done for large international corporations as well as individuals on scopes that have varied from regional programs to site specific.

Education	BA – Geology, State University of New York at Buffalo
Years Experience	30
Professional Registrations	New Hampshire PG #431
Professional Membership	International Society of Explosive Engineers New England Society of Explosive Engineers NHDOT Approved Seismologist Associated General Contractors- Committee Chair (past), Director (past)
Employment History	Continental Placer Inc., President/Senior Geologist Dunn Geoscience Corp. (New England), Dir. of Mining Division/Sr. Geologist Pike Industries, Inc., Field Technician

CONTINENTAL PLACER INC. SINCE 1988

We have seen business through your eyes.

Continental Placer Inc. is a multi-disciplinary consulting firm providing interrelated geologic and environmental services to a wide range of clients. Since 1988, Continental Placer's professional geologists, environmental specialists and technical staff have maintained a distinguished reputation as a client-focused consulting firm, with the highest level of expertise, such as:

- Exploration/Valuations
- Mine Planning
- Mine Safety and Health
- Expert Testimony
- Geologic Mapping
- Environmental Permitting
- Environmental Assessments & Compliance
- Groundwater Resources
- Due Diligence
- Web-based Site Compliance and Data Management Services

PAUL (DUTCH) KRETSCHMER, BLASTING AND VIBRATION TEAM LEAD

P.O. Box 825 • Laconia, New Hampshire 03247

(877) pre-blast • dutch@continentalplacer.com

AREAS OF EXPERTISE

Blasting and Construction Vibration Services. With over four decades of experience beginning with small home improvement projects, Mr. Kretschmer's career includes working in every aspect of building construction from laborer to Site Superintendent to Project Manager for projects up to \$20 million. For the past 18 years his focus has been on the blasting industry. Working with a major drilling and blasting contractor in New England, Mr. Kretschmer was able to become involved in all aspects of the industry. By learning blast design and vibration calculations he was able to assist in obtaining blasting permits. The job required proficiency with the use of a seismograph and the interpretation of seismograms in order to adjust shot design and to defend blast damage claims. Mr. Kretschmer has taken this blasting knowledge and applied it to the construction industry, conducting vibration-monitoring projects for all types of vibration causing construction projects. These projects range from close-in blasting and large quarry operations, to site or road compaction and pile driving for heavy construction projects.



Pre-Blast and Pre-Construction Surveys. Surveys of structures in the area of vibration producing activities are essential to establish a baseline of the conditions of buildings and to provide public relations for high profile projects. Mr. Kretschmer has used his experience in the building trades to provide over 10,000 pre-blast and pre-construction surveys. As this is sometimes the only contact homeowners have with the construction project, Mr. Kretschmer's knowledge of the project and effects of vibration on the home have established a better understanding of the project by the people directly affected.

Post-Blast and Post-Construction Investigations. Allegations of vibration damage are inevitable. Mr. Kretschmer utilizes his experience to document the alleged damages, review all pertinent information, analyze the vibrations and render an expert opinion based upon the data compiled. He has conducted thousands of these investigations for numerous insurance companies throughout the United States.

Expert Testimony. Mr. Kretschmer has provided expert testimony for projects throughout the Northeast during hearings for planning, permitting or defense of damage claims.

Education: BA – Communications, Ohio University

Years Experience: 40

Professional Registrations: OSHA 40 Hour Training
MSHA Certified Instructor
HUD Certified Housing Rehabilitation Specialist

Professional Memberships: International Society of Explosive Engineers
New England Society of Explosive Engineers

Employment History: Continental Placer Inc., Senior Blast/Vibration Consultant
PreSeis Inc., Blast/Vibration Consultant
Maine Drilling & Blasting, Safety Engineer

CONTINENTAL PLACER INC. SINCE 1988

Monitoring and analysis of this kind must be conducted by professional geologists who have the expertise and background knowledge of the construction industry and the area in which it is located. Continental Placer Inc. has the ability to conduct blasting programs, investigation of blasting claims, review of seismograph data for clients throughout the United States. We can provide:

- Public Relations
- Pre-Blast Surveys
- Blast Design
- Vibration Monitoring
- Alleged damages investigations
- Wave Form Interpretation
- Post Blast Inspection
- Expert Testimony
- Interpretation of Seismograms

JEFFERY A. SLADE, SENIOR GEOLOGIST

2 Winners Circle • Albany, New York 12205
(518) 458-9203 ext 304 • jslade@continentalplacer.com

AREAS OF EXPERTISE

Exploration and Site Development: Mr. Slade has over 24 years of experience in exploration and evaluation of construction aggregates, cement and industrial mineral deposits in the eastern United States and Canada. These exploration projects typically involved not only geologic expertise but an assessment of fatal flaws, such as, property acquisition, transportation and markets, and environmental permitting.



In his position as senior geologist, he has extensive experience involving field supervision and project management of exploration drilling and mapping projects. Such projects were often conducted to delineate and quantify ore reserves for construction aggregate and industrial minerals. In order to determine the material characteristic and quality of mineral reserves, Mr. Slade has developed various chemical and physical testing programs for a wide range of commodities.

Environmental Permitting and Regulatory Compliance: Mr. Slade has prepared numerous mining permits for mining operations in New York, Vermont, and Connecticut. These have included the actual state or local mine permit and associated permits such as stormwater permits, stream crossing permits, spill prevention plans and wetland permits. In addition, Mr. Slade has completed permits and managed regulatory compliance issues with the Adirondack Park Agency (APA) of New York, for several regional mining companies.

Computer Simulation and Modeling: The use of computer technology has made it possible to model or simulate all types of conditions encountered in mining operations. Mr. Slade has been highly successful in utilizing computer based simulations and modeling to solve complex mining related problems. A sample of some of the projects completed utilizing this technology include numerous mine sequencing and reserve plans, three dimensional models of karst features involved with a flooded quarry, and several computer simulations of visual impacts from surface mines. Mr. Slade is experienced with the use of both HydroCAD and Autodesk's Land Development Desktop software for use in modeling stormwater events. This HydroCAD based project work has focused on relocation and design of settling ponds, sizing and location of stormwater retention structures, stormwater effects on quarry discharge rates, and development of stormwater plans for surface mines.



Education	BS – Geology, University of Vermont
Years of Experience	24
Professional Membership	Society of Mining Engineers Adirondack Association of Mining Engineers
Professional Registration	Visible Emissions Evaluator – Federal Reference Method Visible Emissions Evaluator Refresher Course
Employment History	Continental Placer Inc., Senior Geologist Rust Environment & Infrastructure (Formerly Dunn Corp.), Geologist Arlington Memorial High School, Computer Instructor Southern Vermont College, Adjunct Professor of Computer Science

CONTINENTAL PLACER INC. SINCE 1988

We have seen business through your eyes.

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- Exploration/Valuations
- Mine Planning
- Mine Safety and Health
- Expert Testimony
- Geologic Mapping
- Environmental Permitting
- Environmental Assessments & Compliance
- Groundwater Resources
- Due Diligence
- Web-based Site Compliance and Data Management Services



W. KYLE CROSSETT, GEOLOGIST

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AREAS OF EXPERTISE

Pre-Blast Surveys and Blast Monitoring: Quarry blasting, for the purposes of moving and crushing material is by far the most cost-effective and widely used method of liberating aggregate from parent rock. As one can imagine, residential and commercial neighbors of quarries are often concerned about blasting and its perceived negative effects, which include ground vibration, noise and air quality. Through the use of pre-blast surveys, and concurrent blast monitoring, Mr. Crossett has ensured that blasting at multiple quarries, does not have a negative impact on respective neighbors, as well as working out site specific blasting effect mitigation techniques.

Mine Permitting and Regulatory Compliance: In today's climate of strictly enforced state and federal environmental laws, the most important investment a mine operator can make is the creation of a thorough mine plan. The planning process must be viewed as an all encompassing and detailed look at the entire life of mine, from initial property purchase, to final reclamation, taking into account multiple aspects such as market potential, local zoning laws and ordinances, site specific geologic attributes and potential environmental concerns in addition to state and federal regulations. Mr. Crossett's mine planning and regulatory acumen has ensured that many material producers have continued to operate and remain profitable regardless of various economic, geologic and regulatory obstacles.

Geologic Source Reports: As per the requirements of the State of New York's Department of Transportation specs, aggregate needed for use in blacktop and concrete must be sampled and tested periodically to ensure material soundness and quality. Mr. Crossett has conducted both field mapping and data collection, as well as map preparation and report drafting for numerous material sources throughout New York State. This information, along with test results, is used to create and submit a source report to gain, or confirm material soundness approval from the Department of Transportation.

Geologic Surveying and Field Mapping: In order to create cogent and detailed Mine Plans and Source Reports, one must know how to effectively implement surveys and subsequent mapping of any given site, both surficially, and geologically. Mr. Crossett has the experience of surveying multiple sites using various tools that include GPS mapping grade equipment and Electronic Distance Measurement (EDM) transit surveys. This has ensured that site maps produced are of the utmost detail with the highest level of accuracy and consistency possible.

Computer Aided Design and GIS Applications: To effectively combine and synergize relevant data gathered from field reconnaissance, surveys, aerial photography, and GIS data, knowledge of computerized applications and their potential for cost-benefit maximization is a must. Mr. Crossett, is well versed in the use of Computer Aided Design software, as well as available GIS databases to deliver accurate and detailed maps and other visual expressions of information. This helps insure site specific awareness, and implementation of plans in an effective manner.

Education	BA – Geology and History, State University of New York at Potsdam MBA – Concentration in environment management, Clarkson University
Years of Experience	5
Employment History	Continental Placer Inc., Geologist Griggs-Lang Consulting Geologists, Project Geologist Dean Herrick Consulting, Geologist



STATEMENT OF QUALIFICATIONS



CONTINENTAL PLACER INC.

A comprehensive team with a diverse range of expertise within the fields of earth science.

Continental Placer Inc. is a multi-disciplinary consulting firm providing interrelated geologic and environmental services to a wide range of clients. Since 1988, Continental Placer Inc.'s professional geologists, senior technicians, and environmental specialists have worked together providing innovative, cost-effective solutions, earning our reputation as a client-focused consulting firm.

Originally formed with the mining industry as its primary focus, our original objective has greatly expanded to offer services within the fields of blasting and construction vibration monitoring, hydrogeology water supply, environmental investigation, slope stability, soil and water remediation, and regulatory compliance. Our professionals are recognized nationally for such specialties as:

- Construction Vibration and Blasting Monitoring
- Blasting Design and Planning
- Environmental Site Assessments
- Environmental Impact Studies
- Geological Services
- Hydrogeologic Services
- Industrial Compliance
- Soil and Ground Remediation
- Expert Testimony
- Real Estate Transaction Assessments Market Studies
- Economic and Financial Feasibility Services



Continental Placer Inc.'s clients range in size from major international corporations to small, privately owned operations. We take pride in our ability to provide quality consulting services. As a professional consulting firm the most important key to our success is the relationship we develop with our clients. We strive to listen and understand each client's distinctive needs and requirements, each client's unique operations. Continental Placer Inc. works closely with our clients to develop realistic and profitable solutions that meet their immediate and long-term project goals. Our clients depend on our ability to form effective relationships with the financial, legal and regulatory communities involved within many industries.

Our client's success is our success. This idea is evident in our many loyal and repeat clients. It is our commitment to quality and improved practices which gives our clients the confidence and the satisfaction to use our services again and again.

OUR CORE SERVICES

Our client's success is our success.

Offering a full range of construction and mining services for over 25 years.



Construction and Industrial Services

- Pre-Blast Surveys
- Post-Blast Investigations
- Blast Vibration Monitoring
- Market Studies
- Acquisition Due Diligence
- Computerized Mapping and Modeling

Water Resources

- Groundwater Supply Exploration and Development
- Production Well Safe Yield Determination
- Wellhead Delineation and Aquifer Protection Zone Determination
- Well Field Management
- Well Redevelopment/Rehabilitation
- Assessment of Surface Water-Groundwater Interactions
- Water Budget Preparation
- Groundwater Flow Modeling

Environmental Services

- Environmental Site Assessments and Compliance Audits
- Environmental Impact Statements
- Permitting (Air, Wetlands, Stormwater, Surface Discharges, etc.)
- Spill Plans (SPCC)
- Subsurface Contamination Investigations (Phase II, RI, Landfills, UST's)
- Water Quality Delineation
- Contaminant Fate and Transport Modeling
- Turnkey Soil and Groundwater Remediation
- Landfill Siting and Closures
- Brownfields Redevelopment
- Building Asbestos Inspection and Sampling

BLASTING AND VIBRATION SERVICES

Monitoring and analysis of this kind must be conducted by professionals. Continental Placer Inc. has the ability to conduct blasting programs, investigation of blasting claims, review of seismograph data for clients throughout the United States.



Using knowledge gained from many years of experience to promote the timely and cost effective completion of any blast types. Continental Placer can provide both the required technical assistance and proven project management necessary for the progress and completion of any project. Continental Placer applies its blasting knowledge and experience We can provide:

- Public Relations
- Pre-Blast Surveys
- Blast Design
- Vibration Monitoring
- Alleged damages investigations
- Wave Form Interpretation
- Post Blast Inspection
- Expert Testimony
- Interpretation of Seismograms

Pre-Blast Surveys: Continental Placer Inc. (CPI) researches all properties within a specified radius of the blast area to gather names and addresses of property owners. Typically, owners are notified of the impending blasting project by certified mail/return receipt requested. The letter also includes our offer to conduct a pre-blast of their property. Surveys are conducted using a video camera with audio capabilities and are done to document the existing condition of structures on the property. The videotapes are kept on file at CPI unless other arrangements are made. In addition to completing the survey, CPI personnel discuss the aspects of blasting with the property owners. This is in an effort to make the owner more aware of blasting, hopefully reducing the potential for blast damage claims.

Third Party Blast Monitoring: CPI can assist in strategically locating and proper set-up of seismographs to monitor each detonation. Recorded blast induced ground vibrations and air overpressures can be interpreted in the field and immediately reported to the blaster in charge.

Post-Blast Surveys: At the request of the blasting company or their insurance company, CPI can conduct a thorough investigation of any blast. Through field investigations, interviews with property owners, analyses of seismic and/or blast records, and review of any existing pre-blast surveys, CPI personnel can determine what effect blasting had on a structure.

RELEVANT PROJECT EXPERINCE

Whether for site construction or quarrying, understanding the science of blasting and the economic value of explosives is paramount to the success of today's blasting projects. Continental Placer applies its blasting knowledge and experience to promote the timely and cost effective completion of blasting projects. Below are a sampling of our blasting and construction vibration monitoring projects followed by additional firm experiences. **Specific project references available upon request.**

Groton Wind Farm Blasting Oversight, Groton, NH. Continental Placer was hired to provide oversight of the blasting operations at the Groton Wind Farm project. This project erected 24 Gamesa G87 wind turbines, located along two ridges, whose peak elevation from was 2,300 feet. Continental Placer worked with the blasting contractors on a daily basis to ensure that blasting operations were completed safely on a very busy and congested site.

NYS DOT Route 4 Rehabilitation D262101, Kubricky Construction. Pre Construction survey for all properties along the project route.

Maine Drilling and Blasting, CPI has worked with Maine Drilling & Blasting throughout the North East for the past 20 years. Projects included:

- Middlebury College Library & Atwater Project, Middlebury, VT
- Numerous highway construction projects throughout New England and New York
- Holyoke Water Works - Holyoke - South Hampton, MA
- Salem Water Treatment Plant - Salem, NH
- Wal-Mart Distribution Center - Raymond, NH
- Manchester Airport Runway Expansion Project
- Endicott College - Beverly, MA
- Libby Hill Ind. Park - Weymouth, MA
- Marriot Hotel - Quincy, MA
- Oxford Airport - Oxford, Ct
- Academy Homes - Roxbury, MA
- Waterford Commons - Waterford, CT
- Ludlowe Middle School - Fairfield, CT
- UCONN - Storrs, CT
- RIDOT Waterline Replacement - Lincoln, RI

Dartmouth College, Hanover, NH, Projects Included:

- Construction of Moore Psychology Building
- Construction of Haldeman Center and Kemeny Hall
- Construction of Class of 1978 Life Sciences Center

Liberty Mutual Insurance, Weston, MA; Dover, NH; Natick, MA; Lynbrook, NY. Continental has conducted almost 300 blast damage claims throughout New England for Liberty Mutual clients.

Acadia Insurance, Westbrook, ME, CPI has conducted in excess of 250 blast damage claims throughout the northeast for Acadia Insurance clients.

CORPORATE CONTACT PAGE

Continental Placer is a licensed and insured corporation with offices in the states of New Hampshire, New York, Pennsylvania, and Illinois.

www.continentalplacer.com

Contact:

Brent J. Tardif, PG, President/Senior Geologist btardif@continentalplacer.com

NEW YORK (CORPORATE OFFICE)

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(717) 975-2862 • Fax (717) 975-2637

Continental Placer Inc. has geologists registered with the American Institute of Professional Geology (AIPG) and in many state throughout the United States. We are proud to be members of many trade and professional associations, on local, state and national levels. These include:

- American Institute of Professional Geologists
- Association of Engineering Geologists
- National Asphalt Producers Association
- National Stone, Sand and Gravel Association
- Society of Mining, Metallurgy and Exploration
- National Stone, Sand and Gravel Association
- International Society of Explosive Engineers
- Association of Groundwater Scientists and Engineers
- American Water Works Association
- National Groundwater Association
- Institute of Scrap Recycling Industry
- New Hampshire Geological Society
- New York State Rural Water Association
- Hudson Mohawk Professional Geologists Association
- New York Construction Materials Association
- Pennsylvania Concrete and Aggregate Producers Association

SEISMOGRAPH SPECIFICATIONS AND CALIBRATION CERTIFICATE

Blastmate III™

Full-Featured, Advanced Vibration and Overpressure Monitor

Range of Applications:

- Blast-monitoring for compliance
- Near-field blast analysis
- Pile driving
- Construction activity
- Demolition activity
- Heavy transportation
- Bridge monitoring
- Structural analysis
- Underwater blast monitoring
- 4 or 8 channel data acquisition
- Remote monitoring - Auto Call Home™

Consultants, engineers and contractors the world over recognize the **Instantel® Blastmate III™** vibration and overpressure monitor as the most versatile and most reliable full featured monitor available. It provides all of the industry-leading features of the **Instantel Minimate Plus™** monitor, conveniently packaged with a full keyboard and a high-resolution printer. This allows you to setup, add notes and print complete event reports in the field, without a computer.

Versatile

With standard features like the **Instantel Histogram Combo™** monitoring mode, zero dead-time between events, and flexible sample rates up to 65,536 S/s, the **Blastmate III** system provides you with control and confidence to monitor reliably in any situation. For added versatility, you have the option to add 4 more channels and extra memory, providing two complete standard monitors in a single package.

For more demanding monitoring applications, the **Instantel Blastware® Advanced Module** software provides the capability to monitor a broad selection of vibration and overpressure sensors, as well as sensors for related structural and environmental measurements. Monitor vibration, ambient environmental conditions, and the movement of structural cracks, all at the same time, all using the same **Blastmate III** monitor.

Easy to use

The features and versatility of the **Blastmate III** monitor set it apart, but the fact that it is also easy to use makes it truly revolutionary. The dedicated single use function keys, backlit LCD and simple menu-driven operation make setup and operation quick and easy, even for inexperienced personnel.

Tough

The **Blastmate III** monitor has been built to survive, with a fully sealed top panel, non-corrosive industrial grade connectors and sealed electronics, all packed in a rugged, water-resistant case.

Blastmate III - Reliability and versatility for any monitoring application.



Key Features

- Fast high-resolution thermal printer for event reports in the field without the need for a computer.
- Full keyboard simplifies entry of job-specific notes and information.
- Dedicated function keys and intuitive menu-driven operation enable quick and easy setup.
- **Histogram Combo** mode allows capture of full waveform records while recording in histogram mode.
- Sample rates from 1,024 to 16,384 S/s per channel - up to 65,536 S/s available on a single channel.
- Available 8-channel option allows for 2 standard triaxial geophones and 2 microphones to be used on a single **Blastmate III** monitor.
- Continuous monitoring means zero dead time, even while the unit is processing.
- Any channel can be matched to a wide variety of sensors - geophones, accelerometers, or hydrophones.

Blastmate III™

General Specifications

Blastmate III

Channels	Microphone and Triaxial Geophone or 4 independent user-configurable channels (two Microphones and two Triaxial Geophones or 8 independent channels with optional 8-channel upgrade)
Vibration Monitoring (with Standard Triaxial Geophone)	
Range	Up to 254 mm/s (10 in/s)
Resolution	0.127 mm/s (0.005 in/s) or 0.0159 mm/s (0.000625 in/s) with built-in preamp
Accuracy (ISEE / DIN)	+/- 5% or 0.5 mm/s (0.02 in/s), whichever is larger, between 4 and 125 Hz / DIN 45669-1 standard
Transducer Density	2.13 g/cc (133 lbs/ft ³)
Frequency Range (ISEE / DIN)	2 to 250 Hz, within zero to -3 dB of an ideal flat response / 1 to 315 Hz
Maximum Cable Length (ISEE / DIN)	75 m (250 ft) / 1,000 m (3,280 ft)
Air Overpressure Monitoring	
Weighting Scales	Linear or A-weight
Linear Range	88 to 148 dB (500 Pa (0.072 PSI) Peak)
Linear Resolution	0.25 Pa (0.0000363 PSI)
Linear Accuracy	+/- 10% or +/- 1 dB, whichever is larger, between 4 and 125 Hz
Linear Frequency Response	2 to 250 Hz between -3 dB roll off points
A-weight Range	50 to 110 dBA
A-weight Resolution	0.1 dBA

Waveform Recording

Record Modes	Manual, Single-shot, Continuous
Seismic Trigger	0.125 to 254 mm/s (0.005 to 10 in/s)
Acoustic Triggers	
Linear	100 to 148 dB
A-weight	55 to 110 dBA
Sample Rate	1,024 to 16,384 S/s per channel (independent of record time), up to 65,536 S/s in single-channel mode with advanced software (maximum 8,192 S/s per channel for 8 channels)
Record Stop Mode	Fixed record time, InstanTel® AutoRecord™ record stop mode
Record Time	1 to 100 seconds (programmable in one-second steps) or 500 seconds plus 0.25 seconds pre-trigger
AutoRecord Time	Auto window programmable from 1 to 9 seconds, plus a 0.25 second pre-trigger. Event is recorded until activity remains below trigger level for duration of auto window, or until available memory is filled. Recording uninterrupted by event processing - No dead time
Cycle Time	
Storage Capacity	
Full Waveform Events	300 one-second events at 1,024 S/s sample rate (1,500 event capacity with optional memory upgrade)
Event Summaries	1,750 (8,750 event capacity with optional memory upgrade)

Histogram Recording

Record Modes	Histogram and InstanTel Histogram Combo™ (monitor captures triggered waveforms while recording in Histogram mode)
Recording Interval	2, 5 or 15 seconds; 1, 5 or 15 minutes
Storage Capacity	46,656 intervals - 3 days at 5-second intervals or 102 days at 15 minute intervals (with memory upgrade - 15 days at 5-second intervals or 540 days at 15 minute intervals)

Physical Specifications

Dimensions	269 x 355 x 165 mm (10.6 x 14.0 x 6.5 in)
Weight	6.4 kg (14 lbs)
Battery	Rechargeable 6 V sealed gel cell - capacity for 30 days of continuous monitoring
User Interface	63 domed tactile keys including full keyboard and dedicated keys for common functions
Display	4-line x 20 character, high contrast, backlit LCD with online help
Printer	High resolution thermal plotter
PC Interface	RS-232
Auxillary Inputs and Outputs	External Trigger, Remote Alarm, coordinate download from GPS
Environmental	
Printer/LCD Operating Temperature	-10 to 50°C (14 to 122°F)
Electronics Operating Temperature	-20 to 60°C (-4 to 140°F)
Remote Communications	Compatible with Telephone, GSM, Cellular, RF, Satellite, Short-haul modems, and Ethernet® device servers. Automatically transfers events when they occur through InstanTel Auto Call Home™ feature.
Additional Features	Monitor start/stop timer



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Ogdensburg, New York 13669
USA

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714B0053 Rev 05 - Product Specifications are Subject to Change

Minimate Plus™

Advanced Vibration and Overpressure Monitor

Range of Applications:

- Blast-monitoring for compliance
- Near-field blast analysis
- Pile driving
- Construction activity
- Demolition activity
- Heavy Transportation
- Bridge monitoring
- Structural analysis
- Underwater blast monitoring
- 4 or 8 channel data acquisition
- Remote monitoring - Auto Call Home™
- Structural monitoring - Flex™

When we asked what you wanted in a vibration monitor, you said “Everything.” So, we designed the **InstanTel® Minimate Plus™** vibration and overpressure monitor. Ever since, it has become a favourite of contractors, consultants, engineers and blasters, because it offers unrivalled features and versatility in a rugged and easy-to-use package.

Versatile

Use the **Minimate Plus** monitor with an **InstanTel Standard Triaxial Geophone** (ISEE or DIN version) and an overpressure microphone (Linear or A Weight) to provide a rugged, reliable compliance monitoring system. Add the **InstanTel 8-Channel** option and a single monitor may be used with two triaxial geophones and two microphones.

For more demanding monitoring applications, the **InstanTel Blastware® Advanced Module** software provides the capability to monitor a broad selection of vibration and overpressure sensors, as well as sensors for structural and environmental measurements. Monitor vibration, ambient environmental conditions, and the movement of structural cracks, all at the same time, all using the same **Minimate Plus** monitor.

Intelligent

For remote installations, the **InstanTel Auto Call Home™** feature will automatically transfer event files from field to office as they are recorded using a variety of wired or wireless modems. From there, the **Blastware Mail** feature of the **Blastware** software automatically distributes files or summary information to multiple e-mail or text messaging addresses.

Easy to use

Even with all of these features, the **Minimate Plus** system is still easy for anyone to use. A high-contrast LCD, eight-key tactile keypad, coupled with simple menu-driven operations, provides complete control and confidence.

Minimate Plus - everything you need and more.



Key Features

- **InstanTel Histogram Combo™** mode allows capture of full waveform records while recording in histogram mode.
- **Auto Call Home** feature automates remote monitoring applications.
- Sample rates from 1,024 to 16,000 S/s, per channel with up to 65,000 S/s available on a single channel.
- Available **InstanTel 8-channel** option allows for two standard geophones and two microphones to be operated from one **Minimate Plus** monitor.
- Non-volatile memory with standard 300-event storage capacity (optional 1,500-event capacity).
- Records waveform events up to 100 seconds long with standard setup, or up to 500 seconds with advanced setup.
- Continuous monitoring means zero dead time, even while the unit is processing.
- Any channel can be matched to a wide variety of sensors - geophones, accelerometers, or hydrophones.

Minimate Plus™

General Specifications

Minimate Plus

Channels	Microphone and Triaxial Geophone or 4 independent user-configurable channels (two Microphones and two Triaxial Geophones or 8 independent channels with optional 8-channel upgrade)
Vibration Monitoring (with Standard Triaxial Geophone)	
Range	Up to 254 mm/s (10 in/s)
Resolution	0.127 mm/s (0.005 in/s) or 0.0159 mm/s (0.000625 in/s) with built-in preamp
Accuracy (ISEE / DIN)	+/- 5% or 0.5 mm/s (0.02 in/s), whichever is larger, between 4 and 125 Hz / DIN 45669-1 standard
Transducer Density	2.13 g/cc (133 lbs/ft ³)
Frequency Range (ISEE / DIN)	2 to 250 Hz, within zero to -3 dB of an ideal flat response / 1 to 315 Hz
Maximum Cable Length (ISEE / DIN)	75 m (250 ft) / 1,000 m (3,280 ft)
Air Overpressure Monitoring	
Weighting Scales	Linear or A-weight
Linear Range	88 to 148 dB (500 Pa (0.072 PSI) Peak)
Linear Resolution	0.25 Pa (0.0000363 PSI)
Linear Accuracy	+/- 10% or +/- 1 dB, whichever is larger, between 4 and 125 Hz
Linear Frequency Response	2 to 250 Hz between -3 dB roll off points
A-weight Range	50 to 110 dBA
A-weight Resolution	0.1 dBA

Waveform Recording

Record Modes	Manual, Single-shot, Continuous
Seismic Trigger	0.125 to 254 mm/s (0.005 to 10 in/s)
Acoustic Triggers	
Linear	100 to 148 dB
A-weight	55 to 110 dBA
Sample Rate	1,024 to 16,384 S/s per channel (independent of record time), up to 65,536 S/s in single-channel mode with advanced software (max 8,192 S/s per channel for 8 channels)
Record Stop Mode	Fixed record time, Instantel® AutoRecord™ record stop mode
Record Time	1 to 100 seconds (programmable in one-second steps) or 500 seconds plus 0.25 seconds pre-trigger
AutoRecord Time	Auto window programmable from 1 to 9 seconds, plus a 0.25 second pre-trigger. Event is recorded until activity remains below trigger level for duration of auto window, or until available memory is filled. Recording uninterrupted by event processing - no dead time
Cycle Time	
Storage Capacity	
Full Waveform Events	300 one-second events at 1,024 S/s sample rate (1,500 event capacity with optional memory upgrade)
Event Summaries	1,750 (8,750 event capacity with optional memory upgrade)

Histogram Recording

Record Modes	Histogram and Instantel Histogram Combo™ (monitor captures triggered waveforms while recording in Histogram mode)
Recording Interval	2, 5 or 15 seconds; 1, 5 or 15 minutes
Storage Capacity	46,656 intervals - 3 days at 5-second intervals or 102 days at 15-minute intervals (with memory upgrade - 15 days at 5-second intervals or 540 days at 15-minute intervals)

Physical Specifications

Dimensions	81 x 91 x 160 mm (3.2 x 3.6 x 6.3 in)
Weight	1.4 kg (3 lbs)
Battery	Rechargeable 6 V sealed gel cell - capacity for 210 hours of continuous monitoring
User Interface	8-key keypad with domed tactile keys
Display	4-line x 20-character, high-contrast, backlit LCD
PC Interface	RS-232
Auxillary Inputs and Outputs	External Trigger, Remote Alarm, coordinate download from GPS
Environmental	
LCD Operating Temperature	-10 to 50°C (14 to 122°F)
Electronics Operating Temperature	-20 to 60°C (-4 to 140°F)
Remote Communications	Compatible with Telephone, GSM, Cellular, RF, Satellite, Short-haul modems and Ethernet® device servers. Automatically transfers events when they occur through the Instantel Auto Call Home™ feature.
Additional Features	Monitor start/stop timer

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Calibration Certificate

Part Number: 714A0801
Description: BLASTMATE III
Serial Number: BA14440
Calibration Date: July 16, 2014
Calibration Equipment: 718A1501

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____



Shiral Periy



Calibration Certificate

Part Number: 716A0403
Description: MINIMATE PLUS W/EXT. GEO
Serial Number: BE14395
Calibration Date: December 22, 2014
Calibration Equipment: 718A1501

InstanTel certifies that the above product was calibrated in accordance with the applicable InstanTel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds InstanTel specifications

InstanTel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at InstanTel and is available upon request.

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Calibrated By: _____

Vipulan Mathi

 **InstanTel**