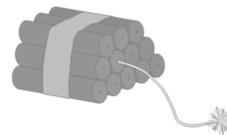


# The Primer



Newsletter of the Golden West Chapter, International Society of Explosives Engineers  
430 32nd Street, Suite 100, Newport Beach, CA 92663

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Issue 1

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## ***President's Message...***

### **Hey Members, Guests & Supporters**

Last year around this time I was letting you all know what a beautiful day and evening we were greeted with during our 2019 annual business meeting. We had the best turnout we have had in a very long time. Head Chef Mike Burneson and crew once again delivered a great spread of Crab & Tri tip and supporting side dishes. The table decorations and the music were once again provided by my family, Paul & Barbera Drake. The popular raffle to support our Wes Bender Scholarship program was a great success. We were even surprised with a visit from one of our scholarship recipients, Cody Mallman and his Mom Paula to thank us for the opportunity and to give us an update on his scholastic plans. Our guest speakers Eric Bennett, Don Robinson and Ladd Stephenson gave very interesting presentations. I also gave a report on the 46<sup>th</sup> annual ISEE conference in Denver. STOP THE PRESSES!!! Let us Fast Forward to the present. -Cancellation of our scholarship shoot-Loss of funding for our next scholarship.-Cancellation of our in-person business meeting/Crab feed at the Mt Pleasant Hall- Loss of funding and worst of all, loss of fellowship with our membership. In its place, our 2020 business meeting was held via zoom on Friday February 26th. How many of us even heard of Zoom until this pandemic hit us? Mike Burneson set up the invite to all members.

Continued on next page...

## The Primer

### Presidents Message Continued...

Attendees were Mike, Myself, Joe Stack (Secretary), Jerry Fulghum (Treasurer) In his 20<sup>th</sup> year at that position, I might add and Eric Bennet. Finally, the two guys sitting on bar stools at Cirino's in Nevada City that thought up the idea of starting the Golden West Chapter: Dale Nies and Wes Bender. We received another surprise visit from Cody Mallman and his Mom to share the incredible challenges students faced this year. The ISEE annual conference was cancelled as well but I was able to attend the virtual annual membership zoom meeting on February 25<sup>th</sup>. No chapter workshops, no award presentations and no mingling with the other chapter members including most of the vendors that support our chapter newsletter and the scholarship fundraiser. Winston Forde, executive director, informed us that membership is off significantly. He estimated 500-600 memberships down from last year due to not having the conference where a lot of memberships are renewed. There will be an increase in dues with discounts if purchasing more than one-year memberships. The blasters training modules have been a success with over 590 attendees and 17 states approving the training for Blaster license certification. California not included currently. They are planning on a conference to be held in Las Vegas in 2022 with a date TBD. If you have not done it yet, go to the ISEE store and purchase the new video DVD "The Explosives Power Tool" sponsored by our friends at Nobel Insurance. It is a great introduction into the world of blasting and can be used as a training tool for new hires or people that just want to know.

I will let Mike share what transpired at our meeting, the result of our elections and our focus going forward in the editors notes. I am hopeful after getting vaccinated, that there is light at the end of this very dark tunnel and that we can get together soon to celebrate. Until then, enjoy the newsletter, be vigilant and continue to follow current COVID 19 protocols and directives.

Your President  
Mike Chiurato

### **Editors Notes ...**

Its hard to believe that over a year ago we held the 2019 dinner meeting in person on February 22, 2020. It was a very Mount Pleasant memory. Moving forward the wheels fell off the bus and we were quarantined at home for what has seemed like eternity. We ran out of toilet paper. Todd Harris passed. I.S.E.E. canceled their annual conference. Wildfires. We had to cancel our scholarship fundraiser. We had to cancel our crab feed business dinner. The international made the same mistake our chapter made failing to send out the required notice to members notifying them of the upcoming meeting. We should all be proud of the fact that we have been able to continue to fund our four scholarship recipients. Looking back at 2020, I realize how horribly bad this pandemic affected many of our families, friends and children. I cannot imagine being a high school senior or going to my first year of college and having it all disappear in what was a terrible reality. My nephew was in his senior year of high school and as most of you know the kids did not have a real graduation. The whole learning from home thing did not work so well for a lot of kids. I was very appreciative that one of our scholarship recipients took the time to join our 2020 business meeting we held via zoom on February 26, 2021. He explained some of the extenuating circumstances that caused him to not be in compliance with the scholarship guidelines.

**Continued on next page...**

## **The Primer**

### **Editors Notes Continued...**

After hearing Cody's reasons for non-compliance, the officers and board members and both our founding members (Wesley Bender-Dale Nies) discussed the need to add language to our scholarship guidelines. We worked together through several drafts and developed the following language.

**Extenuating Circumstances:** If a scholarship recipient encounters conditions beyond his or her control and said conditions cause the recipient's GPA to fall below 3.0 or otherwise adversely affect their academic standing, they may appeal to the Judging Committee to have their scholarship deferred (suspended) for the upcoming semester. The appeal should contain sufficient facts and particulars to allow the Judging Committee to render a decision. At the end of the deferred semester, if all of the academic requirements for the scholarship have been met for that semester, the recipient, upon providing proof of eligibility will be issued a \$1000 stipend for the next semester. If the scholarship recipient fails to achieve a GPA of at least 3.0 after receiving two consecutive deferrals, the scholarship shall be cancelled. Decisions of the Judging Committee in these matters shall be considered final.

**Continued on next page...**

### Editors Notes Continued...

I am a little disappointed that so few members attended the Zoom business meeting. All thing considered, I was pleased with our meeting and I very much enjoyed seeing Wes Bender, Eric Bennet, Mike Chiurato, Gerald Fulghum and Joe Stack. The election was held for the following positions.: President, Secretary and Board member. Elected to the position of President (This came as a huge surprise) Mike Chiurato. Elected to the position of Secretary: Joe Stack. We thank you for your service to the chapter Joe. I am very excited to welcome our newly elected member to the Board of Directors long time member Eric Bennett. I would like to mention that our Treasurer Jerry Fulghum is serving in his twentieth year in this office. We really appreciate the great job you do for the chapter Jerry. The Officers and Board members plan on holding a scholarship fund raiser later this year when the Covid restrictions ease up. We will keep you informed. We need to have a good fundraiser since we have waived dues last year and have not been able to have our dinner or fundraiser while we continue to fund the scholarship recipients.



The Mine Safety & Health Conference will be held in person at the Rio Hotel.

The event dates are set for October 25th, 26th, & 27th 2021 !



# ISEE Blasters Training Webinar Series Now Available On-Demand!

## Blasters Training Webinar Series - Part 1

Approximately 4 hours - Cost \$100

- 1-1 Fundamentals of Blast Design  
by Joe Nawrocki, Senior Technical Manager, Dyno Nobel  
*Presentation sponsored by Tradestar*
- 1-2 Importance of Communication Between Drillers and Blasters  
by Seth Burns, ISG Manager, Nelson Brothers  
*Presentation sponsored by Montabert*
- 1-3 Explosive Products: Properties and Application  
by Alastair Torrance, Principal, Kilmore Consulting Pty Ltd  
*Presentation sponsored by O-Pitblast*
- 1-4 Preventing Flyrock Through Good Blast Design and Delay Timing  
by Richard O'Meara, US Technical Services Director, Orica  
*Presentation sponsored by Lubrizol*

## Blasters Training Webinar Series - Part 2

Approximately 4 hours - Cost \$100

- 2-1 Close In Construction Blasting  
by Mike Koehler, President, B.E. Consultants, Inc.
- 2-2 Blaster's Math  
by Bill Necker, Manager of Technical Services, Maurer & Scott  
*Presentation sponsored by GeoSonics/Vibra-Tech*
- 2-3 Legal Advantages of Good Blast Reports/Recordkeeping  
by Kelly Ratliff and Ralph Burnham, Attorneys, Reminger Co., LPA  
*Presentation sponsored by JM Miller, Inc.*
- 2-4 Vibration Level One+  
by Jeff Taylor, President, Sauls Seismic, LLC

### On-Demand Training Details

Each four-hour webinar is valid for one certificate of completion. If you have previously taken the course and received a certificate, you will not earn another one by taking the quiz again. If this webinar is being taken for retraining credit hours, a 20-question quiz must be completed after watching the webinar in its entirety. Users who score 75 percent or higher, and who submit a signed affidavit stating the entire webinar was watched, will receive a certificate of completion. Register online at [www.isee.org](http://www.isee.org).

Several states have approved to accept this training including: Alabama, Colorado, Delaware, Hawaii, Indiana, Kansas, Kentucky, Maryland, Missouri, Montana, New York, Ohio, Pennsylvania, Tennessee, Virginia, Washington, West Virginia and Wyoming. Check ISEE's website for an up-to-date list of states.

## Blasters Training Webinar Series - Part 3

Approximately 4 hours - Cost \$100

- 3-1 Geology Level One+  
by Kurt Oakes, Senior Manager - Drill & Blast, Peabody Energy  
*Presentation sponsored by Dyno Nobel*
- 3-2 Flyrock  
by Jay Elkin, Wampum Hardware  
*Presentation sponsored by Tread Corporation*
- 3-3 Bulk Explosives Equipment and Use  
by Mark Curry, Technical Services Manager, Orica  
*Presentation sponsored by O-Pitblast*
- 3-4 Blasting Safety Level One+  
by Maggie Hettinger, Senior Technical Engineer, BME USA

## Blasters Training Webinar Series - Part 4

Approximately 4 hours - Cost \$100

- 4-1 Public Relations  
by Josh Hoffman, Director of Technical Services, IME
- 4-2 Preventing Block Movement/Misfires Through Good Blast Design and Delay Timing  
by Frank Lucca, President, Terra Dinamica LLC
- 4-3 Loading Bulk Blasting Agents and Quality Control on the Bench  
by Frank Sames, Technical Manager, Austin Powder Company  
*Presentation sponsored by Austin Powder Company*
- 4-4 Transportation of Explosives  
by Matt Spina, State Trooper, CT State Police

### Webinar Series Partners



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### Silver Sponsors

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## Larkspur Landing - Marriott's Hotel

By Wes Bender

In late 1985, I got a call from Dick Hall of Kiewit Pacific asking if I was available to assist them on a contract that they had been awarded for site preparation for a new Marriott's Hotel and Condominiums in Larkspur, California. The project involved a considerable amount of blasting in close proximity to apartment buildings and a shopping center.

The site where the hotel was to be built was in a portion of an abandoned quarry. Previously, the eastern half of the quarry had been recontoured and now contained a complex of 342 apartments. The remaining half of the quarry needed to be developed for the hotel. Across the street from the site was a shopping center and on the western edge was an office complex.

I met with Dick and with Jim Murray, the project superintendent and Phil Mitchell, the project engineer, and we reviewed the site. There was a total of 220,000 cubic yards of excavation, an estimated 160,000 cubic yards of which required blasting. The main concern was a rock ridge that ran north and south along the eastern edge of the site. It had not been quarried previously due to the poor quality of the rock. It was 80 feet tall and the base was approximately 50 feet from the nearest row of apartments. This ridge made up most of the 160,000 cubic yards to be blasted. Of this, 136,000 cubic yards had to be crushed and stored on site for later use.

After reviewing the site and the specifications, we laid out a plan to accomplish the work in the six months allocated, with a mind to minimizing the adverse effects on the surrounding neighbors. I developed a letter that we could distribute to everyone concerned in the vicinity. It explained what we were doing, that there would be controlled blasting, what the blasting signals were and what they might expect to feel. It also gave names and phone numbers to call if they had any concerns. I determined that I should accomplish pre-blast condition surveys on the closest 112 apartments and on one building in the shopping center. The office complex on the west side was at a sufficient distance that pre-blast surveys there were not deemed necessary.



Kiewit completed their mobilization while I conducted the pre-blast surveys. After the surveys were complete, documenting all of the existing defects in the apartments, we started the blasting program. We felt that we would be better served if we started blasting on the opposite side of the ridge from the apartments and then slowly blast nearer, taking out the east side of the ridge last. By that time, the apartment dwellers would be accustomed to the blasting. Work was restricted to the hours between 8 a.m. and 5 p.m. We usually shot twice a day, timing the blasts to be detonated at times when there was a considerable amount of distant activity and traffic noise.

During the pre-blast surveys, the apartment complex manager indicated to me that several of the occupants were concerned about a rock pinnacle that was high on the top of a slope behind the apartments. It was rumored that the pinnacle had been slipping and they were worried that vibration from the blasting might bring it down into the rearmost apartment buildings. Phil and I went up and inspected it and determined that it had not moved and appeared to be stable. He painted a small target on the back of it and a matching target on a bedrock outcrop about 50 feet behind it. After each of the early blasts and occasionally thereafter, Phil and a technician measured the distance between the targets. There was no evidence of the pinnacle moving.

Prior to the start of blasting, a meeting was held with all project personnel concerned and I laid out four standard blasting patterns to be utilized. Kiewit owned an REO BM 125-10Z sequential blasting machine that would be used to initiate all blasts. In effect, this machine is ten electric blasting machines in one, which we programmed to fire 10 milliseconds apart. The machine checked each circuit just before firing and would shut down if the next circuit to fire didn't show continuity. The sequential machine, coupled with Atlas Rockmaster electric detonators in delays 6 through 23, allowed the design of fairly large blasts where no two holes would detonate simultaneously. By using the 6<sup>th</sup> delay (125 ms) as the first detonator, all of the detonators would have seen their firing current before the first hole detonated. (Today Nonels would be used to initiate such blasts, but Nonel surface delay units were not competitive price-wise at the time and, in any case, project personnel were more familiar with electric detonators.)

To minimize low frequency concussion, I designed the blasts such that the rate of blast progression along any row of holes was at or below half the speed of sound. Blasting patterns, using 3" diameter holes, ranged from 5' x 5' for the shallower and/or smaller blasts, to 8' x 8' for most of the production blasts. Maximum hole depths were 22 feet. Blasts were designed to keep vibration at the nearest apartments at or below 0.4 in/sec. Vibration in the shopping center and at the office buildings on the west side of the project would be much lower.

Because the rock had to be shot rather lightly, both to reduce vibration and to prevent flyrock, it was anticipated that there would be some oversize material in the upper regions of many blasts. For this reason, a Cat with a ripper was used to dig out

each blast. A Hy-Ram hydraulic breaker mounted on a Cat 235 excavator was utilized to reduce any oversize material so that it would go into the 42 x 48 jaw crusher.

I emphasized the need to properly stem the holes with crushed stone to prevent flyrock caused by a hole “rifling”. In most blasting situations, holes are stemmed with the closest available material, the drill cuttings that are mounded around the hole. This isn’t the most efficient stemming material, however. Jim had ¼” crushed gravel delivered to the site. At least a couple feet of this were poured down each hole on top of the explosives column and then the hole was stemmed to the collar with drill cuttings. When explosive energy pushes upward on the crushed stone, it tends to lock into place and hold for a longer period before finally yielding. This helped with fragmentation in addition to preventing flyrock.

After the crusher, screening plant and portable generator were in place and operational, I conducted a stray current check in the surrounding area. An unacceptable level of stray current was found that would have precluded using electric detonators. A heavy ground cable was then used to bond all of the powered equipment together, reducing stray current in the ground to safe levels.



Initially, I had Kiewit monitor blasts with three blasting seismographs. These were placed at the three closest buildings. Also, for the first four blasts, I placed an additional unit nearer to the blasts, providing a greater range of data to assist in developing more accurate vibration regression rates. It turned out that, due to site response characteristics, blast vibration attenuated more quickly with distance than I had anticipated. After a reasonable amount of data had been gathered, we reduced the seismographs to two for the remainder of the blasting program.

Once blasting was well underway, with vibration and airblast below the intensities that might cause problems, there was no need for my constant presence on site. I did, however, continue to visit the site every two to three weeks or whenever Jim felt I needed to address some specific problem. I would review the blasting program, the blast reports and vibration and air blast records and then provide them with a report on my findings.



122 blasts, utilizing a total of just under 111,000 lbs of explosive, about two thirds of which was AN/FO, were required to remove the rock.

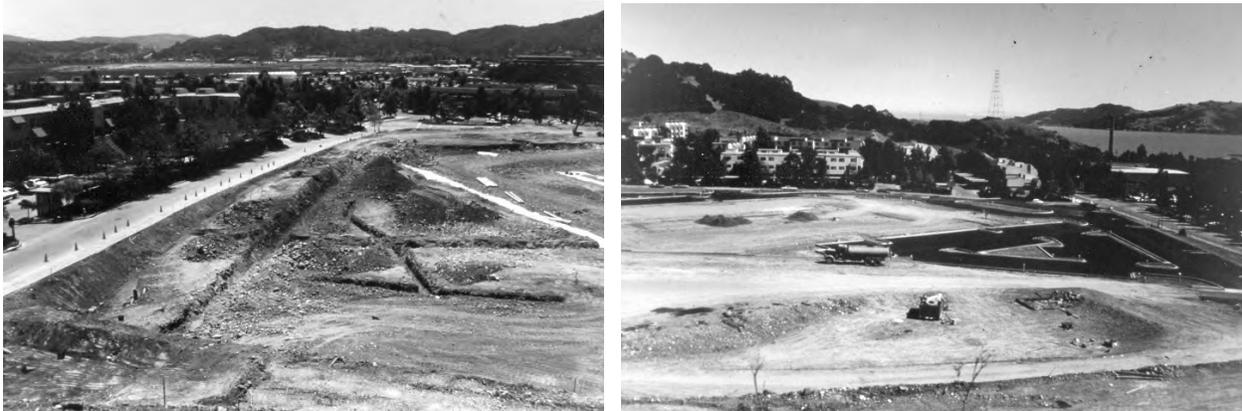
In spite of all of our efforts, there were some complaints of damage. Early in the blasting program, a complaint was received from a homeowner on the opposite side of the Highway 101 freeway, approximately ½ mile away. He complained that his home was slipping down a slope because of the vibration from blasting. The city indicated to us that he was a chronic complainer, but we investigated his claim anyway. I attempted to record blast vibration near his home, but any vibration that managed to reach his location was masked by the traffic on the freeway. He didn't pursue the matter further.

Part way through the program, one hole blew out, resulting in a broken bathroom window in one apartment, a broken glass-topped patio table, a car's rear window being broken and a car that suffered scratched paint. Kiewit promptly addressed the situation and had repairs effected. We held a meeting with the blasting crew, re-emphasizing the need for good stemming practice. No more flyrock occurred from any of the blasts.

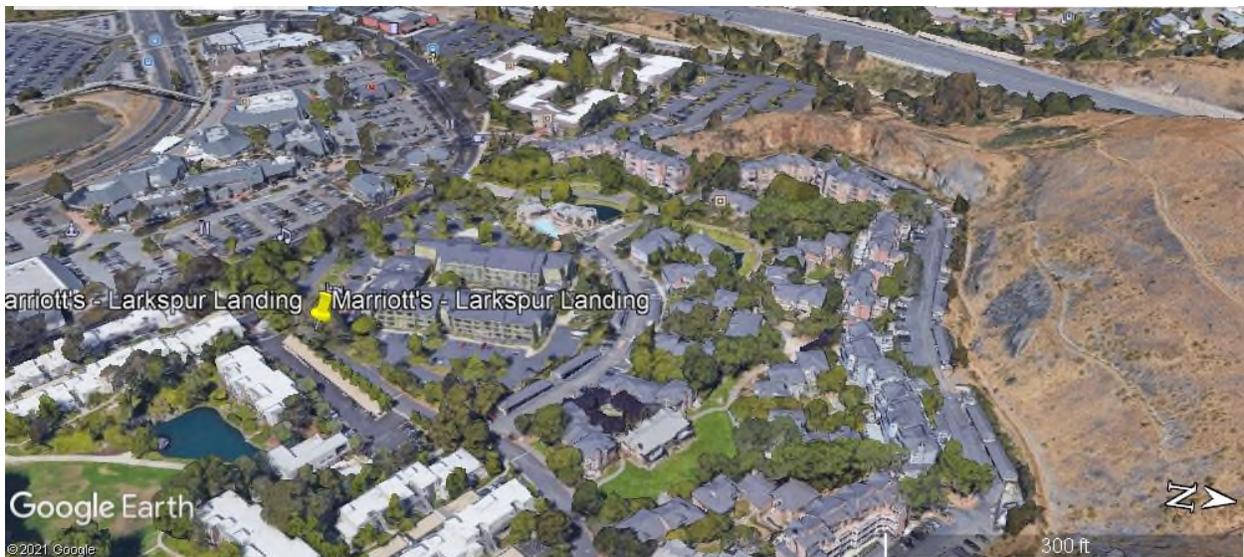
Just as the blasting was coming to an end, a complaint was received from a lady in one of the more distant apartments that an antique plate had fallen and broken. This occurred while she was away for a few days, but she was sure that blasting had caused it to fall. The cost of my traveling to the site and investigating her claim would have far exceeded the amount she was asking, so Kiewit opted to pay her. At my suggestion, however, they delayed payment until after all blasting had been completed. This served to preclude other claims that might have been forthcoming when she told all of her friends about her good fortune. (I found out later that a small earthquake had occurred in the bay area during the time frame when the plate was supposed to have fallen. That was probably the true cause of the breakage, but there were no witnesses to the actual occurrence.)

Another possibly hazardous situation developed on the project with a young lady who lived in one of the upstairs apartments immediately adjacent to the project. Occasionally she would arrive home in the afternoon, take off her clothes and wander about her apartment with the curtains open. It was all that the drillers could do to keep their feet out from under the drills. (We were pretty sure she knew what she was doing.)

The project owner was so impressed with Kiewit's performance on this contract that before it was completed, they awarded Kiewit the next contract for paving and utilities without taking any bids. This new contract was received before final grade was reached in the ridge blasting. Jim and Phil overlaid the utilities excavation drawings over the shot patterns for the final lift and then drilled and loaded holes in those blasts to also break the rock deeper in the trenches that would be required. That saved them a considerable amount of money in the follow-on contract.



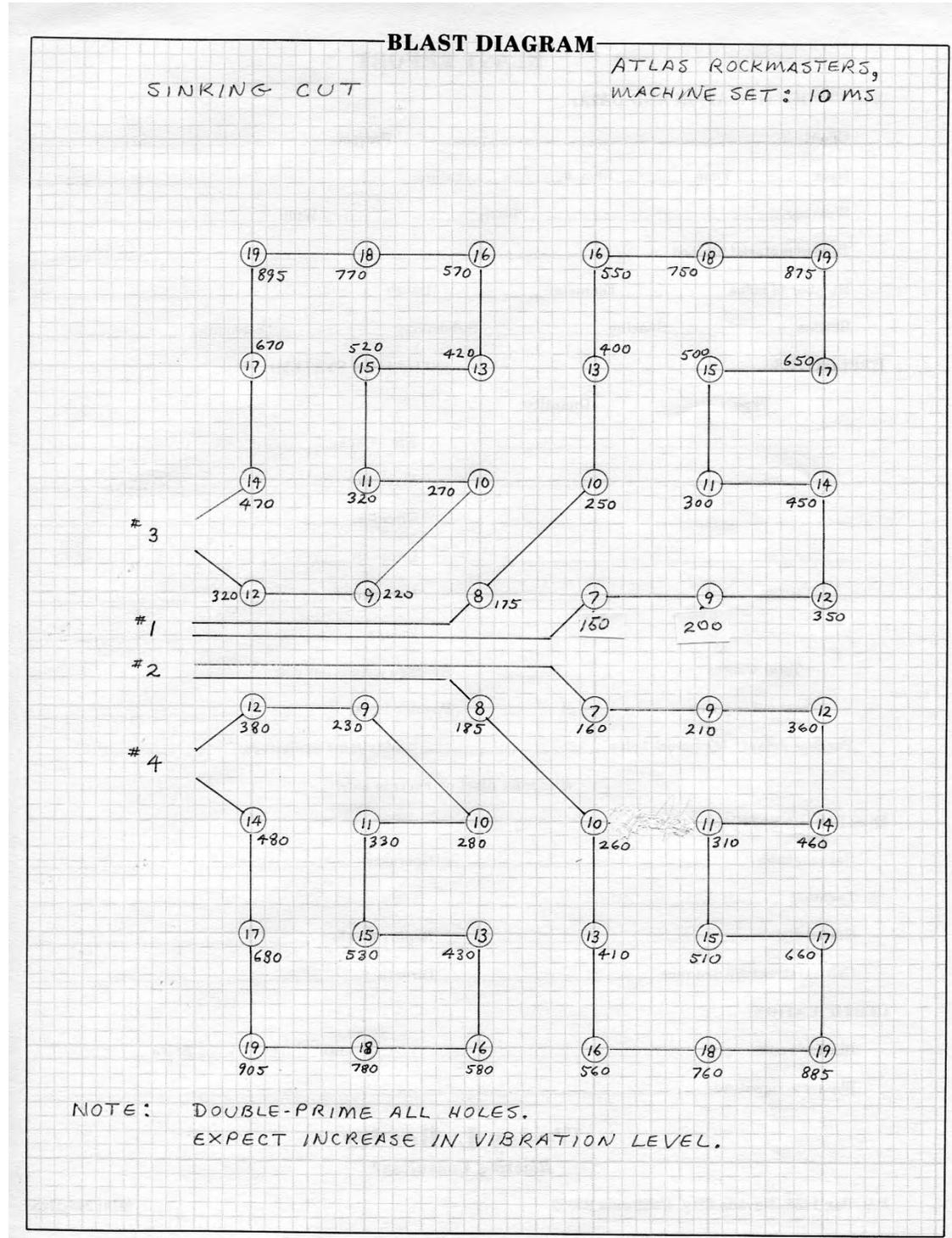
Photos are courtesy of Jim Murray and Kiewit Pacific Co.



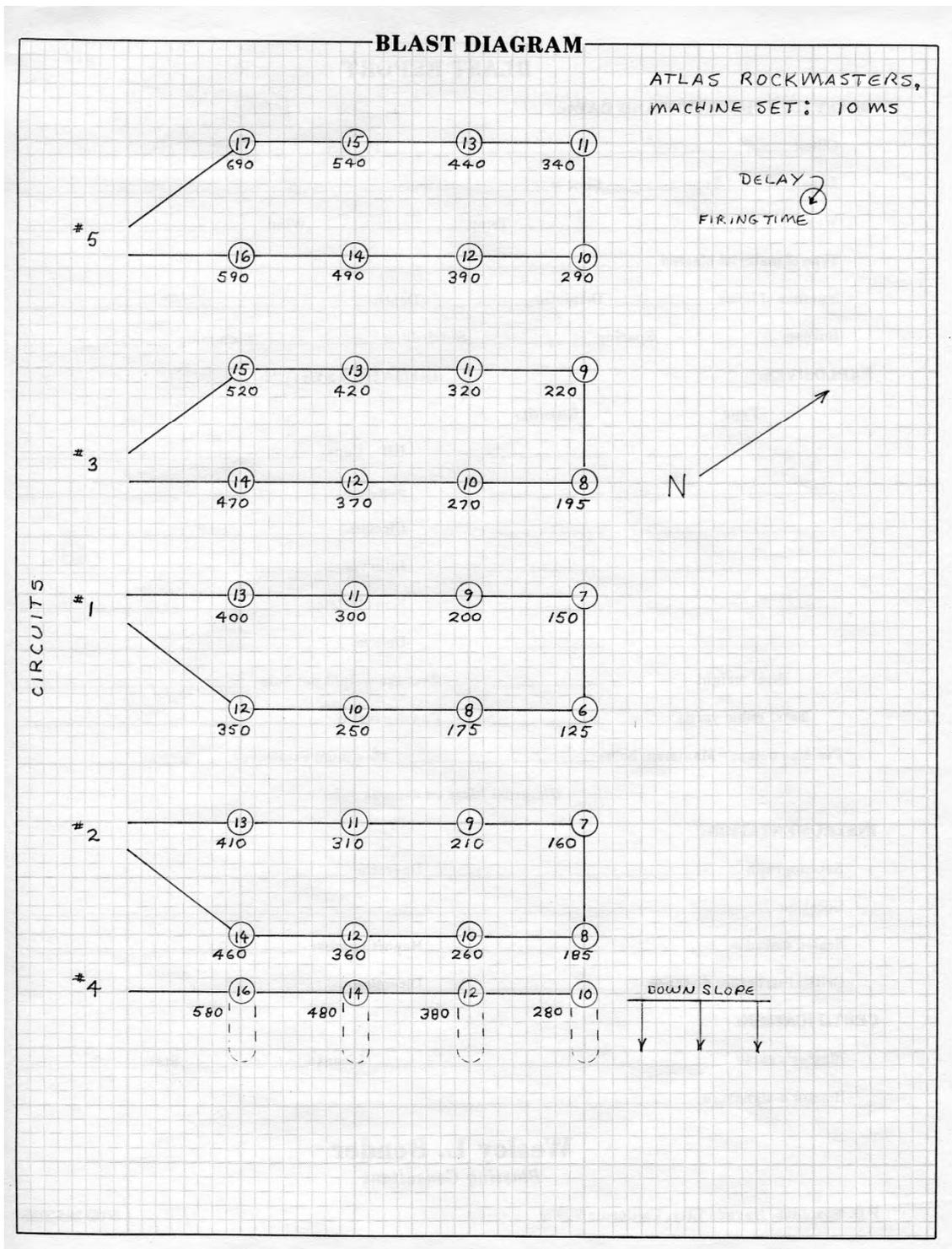
Larkspur Landing site as it appears today (courtesy of Google Earth).

Marriot's Hotel in center. White buildings in lower left are the apartments.

Following are some of the blast timing schemes that we developed for use with the sequential blasting machine that was used on this project. Numbers within the circles are the detonator delay number. Adjacent numbers are the actual firing time of the hole in milliseconds after pressing the fire button.



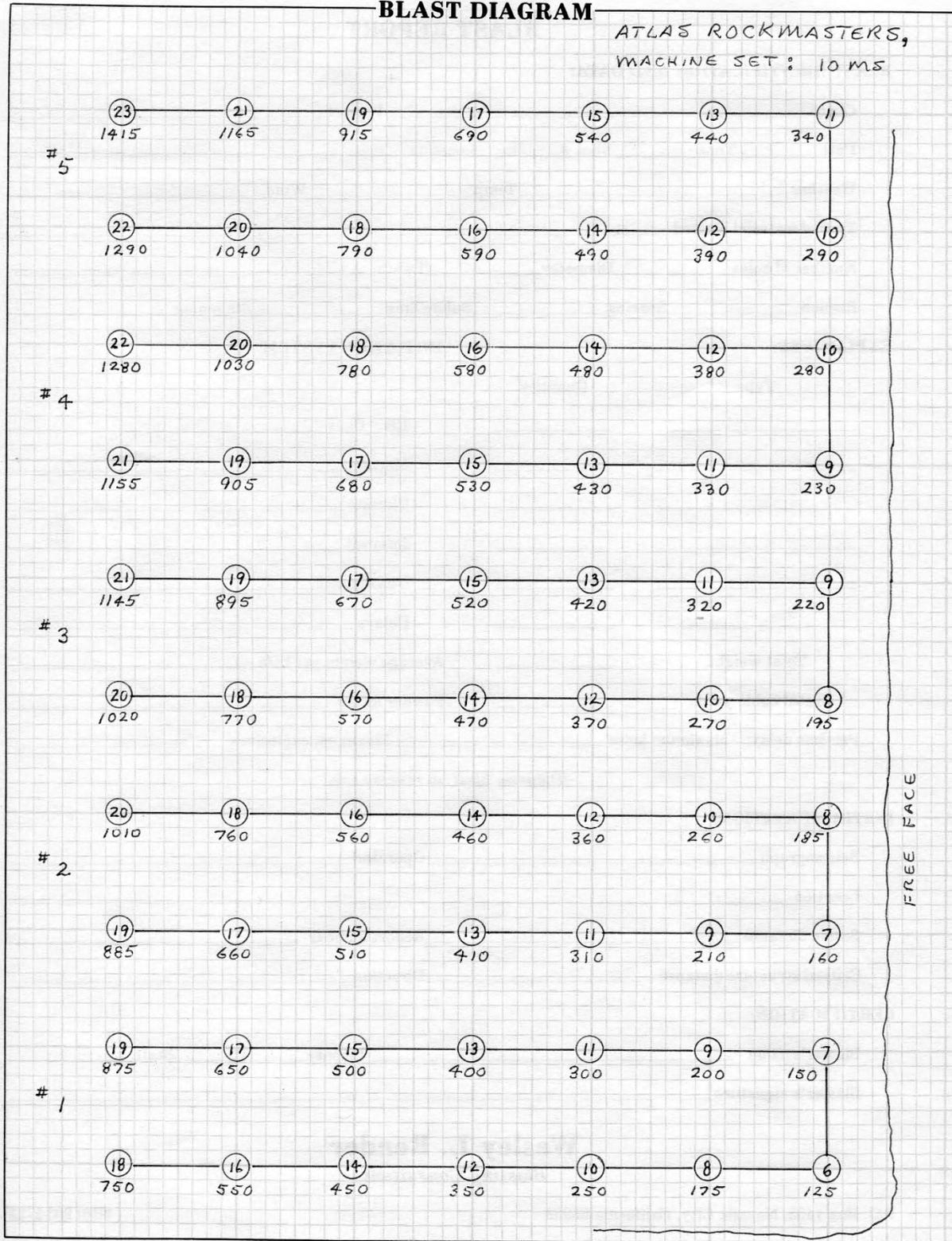
Sinking cut blasts where no free face exists



Blast design for blasting on the slope nearest the apartments. Gravity prevents pulling the rock upslope and tries to pull it downslope. This design tends to pull rock sideways along the slope and it worked quite well. A row of K-rail was placed along the edge of the street to catch any rock that rolled down the slope.

# BLAST DIAGRAM

ATLAS ROCKMASTERS,  
MACHINE SET : 10 MS



Conventional blast timing for blasts with one or more free faces.

## **Calling All Students: ISEE Accepting Scholarship Applications**

The SEE Education Foundation will be awarding \$95,000 USD in scholarships to students pursuing degrees related to the explosives industry. The scholarship acceptance period is February 26, 2021, to May 7, 2021.

To be eligible, students must be, or plan to be, pursuing a technical, undergraduate, graduate or doctorate degree in a field related to the commercial explosives industries. Students will be assessed on academic and professional achievements, industry goals, a personal challenges narrative and a brief statement of financial need.

Each year, the scholarship committee reviews and scores applications from students in a wide range of disciplines and makes awards ranging from \$1,500 USD to a top award of \$7,500 USD to well-qualified students.

### **About the SEE Education Foundation**

The SEE Education Foundation is a nonprofit organization created in 1996 to serve the long-term education interests of the explosives industry through the development of education and training materials, championing the inclusion of explosives instruction in engineering curricula and awarding scholarships to eligible students.

## **Get Your Paper Published in the Blasting and Fragmentation Journal**

Have you recently worked on a project that focuses on fragmentation by blasting? This is your chance to get your research published.

Submit your paper, including tables, graphics and images to the editors-in-chief at the link below. Be sure to state the name of the paper and the purpose of publication in the journal when submitting.

Edited and reviewed by expert researchers, industry professionals and academics, Blasting and Fragmentation presents contemporary analysis of engineering practices as related to explosives application to rock. It is published twice a year.



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Treasurer Gerald "Jerry" Fulghum  
Secretary Joe Stack  
Board member Eric Bennett  
Board member, Newsletter  
Editor Mike Burneson  
Website Master Wes Bender

Chapter Activities

Scholarship Fundraiser  
September or October 2021

Business meeting February 2022



State of California  
 Department of Industrial Relations  
 Division of Occupational Safety & Health  
 Mining & Tunneling Unit



**Gas Tester, Safety Representative and Blaster Exam Requirements**

**Experience is required in the type of work for which you're requesting license or certification:**

Gas Tester: at least 1 year of underground experience

- \$15 for any or all GT exam portions
- Must have experience in gassy situations if applying for gassy certification
- Bring your testing instrument and unexpired calibration gases

Safety Representative: at least 2 years of underground safety experience

- \$15 for any or all SR exam portions
- Must have experience in gassy situations if applying for gassy certification

Blaster: at least 3 years of blasting experience

- \$15 for any or all blasting exam portions
- Describe your explosive experience, including what kind of explosive work you have done, and what kind of explosive materials you have used.

**Each examinee must provide the following at least 10 days before the exam:**

Application and Form W-1.

- Complete both pages of the appropriate application, and sign on Page 2.
- Complete all pages of the Form W-1, and sign on Page 4. All pages must be submitted.

Check or Money Order, payable to "State of California".

- We cannot accept cash or credit/debit card payments.
- We cannot issue refunds.

**The following must be provided at the time of the exam:**

One of the following forms of unexpired photo\* identification:

- Driver's license
- State-issued ID card
- Military ID card

One of the following:

- Birth Certificate
- Current Passport

\* A temporary ID without photo must be accompanied by a current passport or other item with photo. M&T Certification or License cannot be used as an ID.

**Exam Locations and Dates**

Contact the following offices for scheduled dates and times:

<p>District 1 (North)          1750 Howe Ave, Suite 300          Sacramento, CA 95825-3369          (916) 574-2540</p>	<p>District 2 (Central)          6150 Van Nuys Blvd, Suite 310          Van Nuys, CA 91401-3345          (818) 901-5420</p>	<p>District 3 (South)          464 W. Fourth St., Suite 354          San Bernardino, CA 92401-1442          (909) 383-6782</p>
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NOTE: Following a failed exam, we require 90 days to have elapsed before re-taking the exam.

### Fire in the Hole...

Two guys are walking through the woods one day when they stumble across a big deep hole. The first guy peers into it and says, "Wow! That looks deep."

The second guy says, "It sure does. Let's throw a few pebbles in there and see how deep it is. We'll be able to tell the depth by how long it is before we hear the noise of the pebbles landing."

So they pick up a few pebbles and throw them in and wait. Nothing. There's no noise.

The first guy says, "Jeez. That is really deep. I know, let's throw one of these great big rocks down there. Those should make a noise."

So they pick up a couple football-sized rocks and toss them into the hole and wait... and wait... Again, nothing.

They look at each other in amazement. Then the first guy gets a determined look on his face and says, "Hey, over here in the weeds, there's a railroad tie. Help me carry it over. When we toss that sucker in, it's gotta make some noise."

So the two of them drag the heavy tie over to the hole and heave it in. Once again, not a sound comes from the hole.

Suddenly, out of the nearby woods, a goat appears, running like the wind. It rushes toward the two men, then right past them, running as fast as it's legs will carry it. Suddenly it leaps in the air and into the hole.

The two men are astonished with what they've just seen and look at each other in amazement. Then, out of the woods comes a farmer who spots the men and ambles over. He asks them, "Hey, you two guys seen my goat out here?"

The first guy says, "You bet we did! Craziest thing I ever saw. It came running like crazy and just jumped into this hole and disappeared!"

"Nah", says the farmer, "That couldn't have been my goat. My goat was chained to a railroad tie."