Maine Drilling & Blasting

Natick Ave Solar Blasting Presentation

Cranston, RI

April 19, 2023

Introduction

- **Presenters -Andy Dufore - MDB Regional Manager**
  Matt Shaughnessy - MDB Divisional Manager

- **Maine Drilling & Blasting (MDB) - 57 years experience – in business since 1966**

- **Local offices located in Milford, MA**

Presentation Topics

Maine Drilling & Blasting

- **Blasting Safety and Pre-Blast Planning**
- **Measuring Ground and Air Response, Human Perception, What Research Has Revealed**
- **Projects blasted in close proximity to the Tennessee Gas Pipeline**

Blasting Safety

Maine Drilling & Blasting

Pre-Blast Planning

Hazard Assessment

Our most important responsibility in working on any jobsite is to identify potential hazards before the project starts.

Pre-Blast Planning

Pre-blast Condition Survey

Maine Drilling & Blasting

Pre-Blast Planning

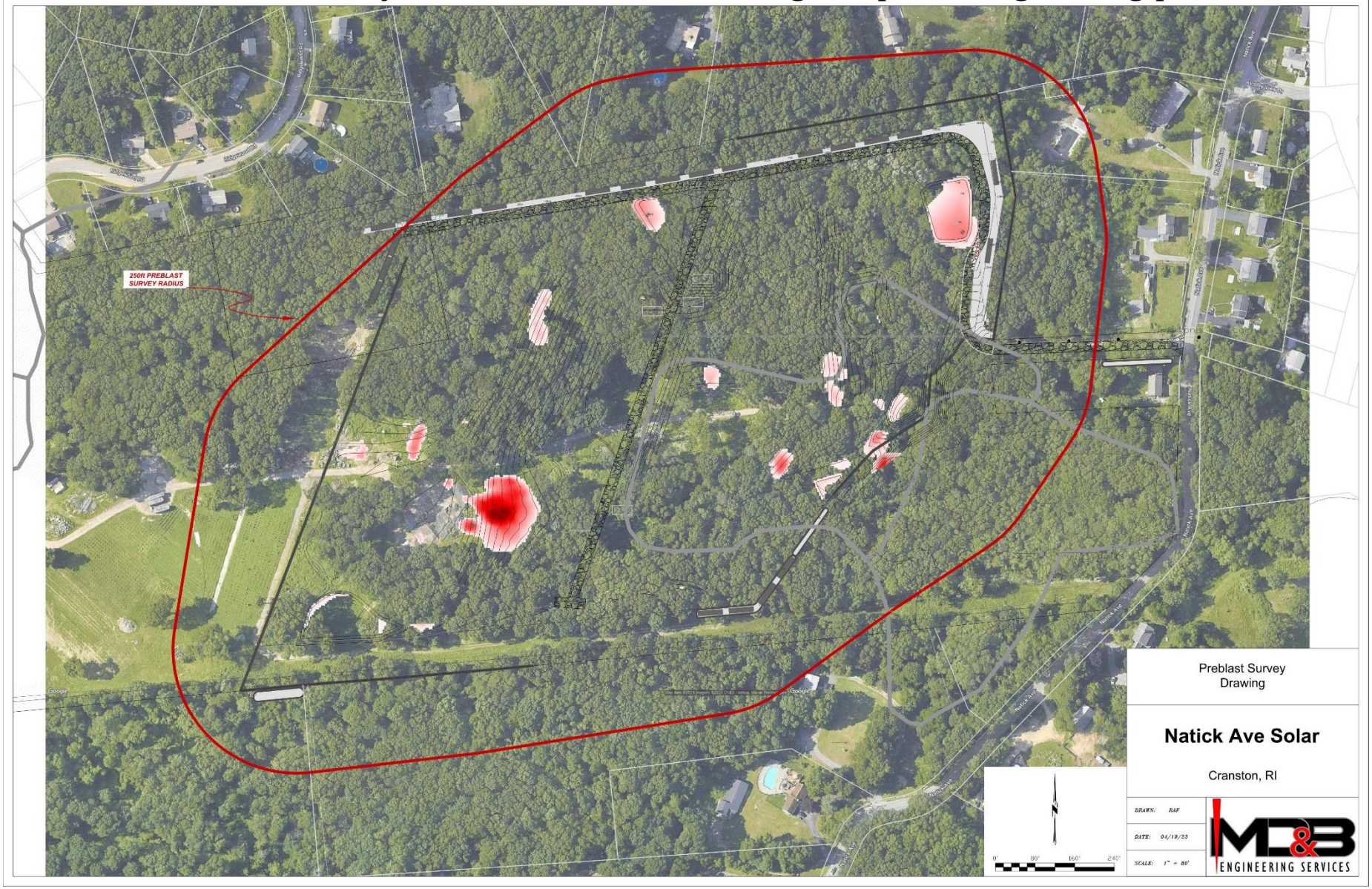
Pre-blast Condition Survey

Maine Drilling & Blasting

- **Vibration can be perceived at levels as low as 1/100th of the safe level for residential structure.**
- **When vibration generated from a new blasting operation is initially felt, the natural response of a home owner will often be a focused inspection of his or her home that will reveal pre-existing but unnoticed cracks (generated by natural environmental forces).**
- **The inspection also identifies surrounding activity, operation or process that the proposed work may need coordination with.**

Pre-Blast Planning – Preblast Condition Survey

Pre-blast Survey locations established through maps and engineering plans



Pre-Blast Planning

Blast Design:

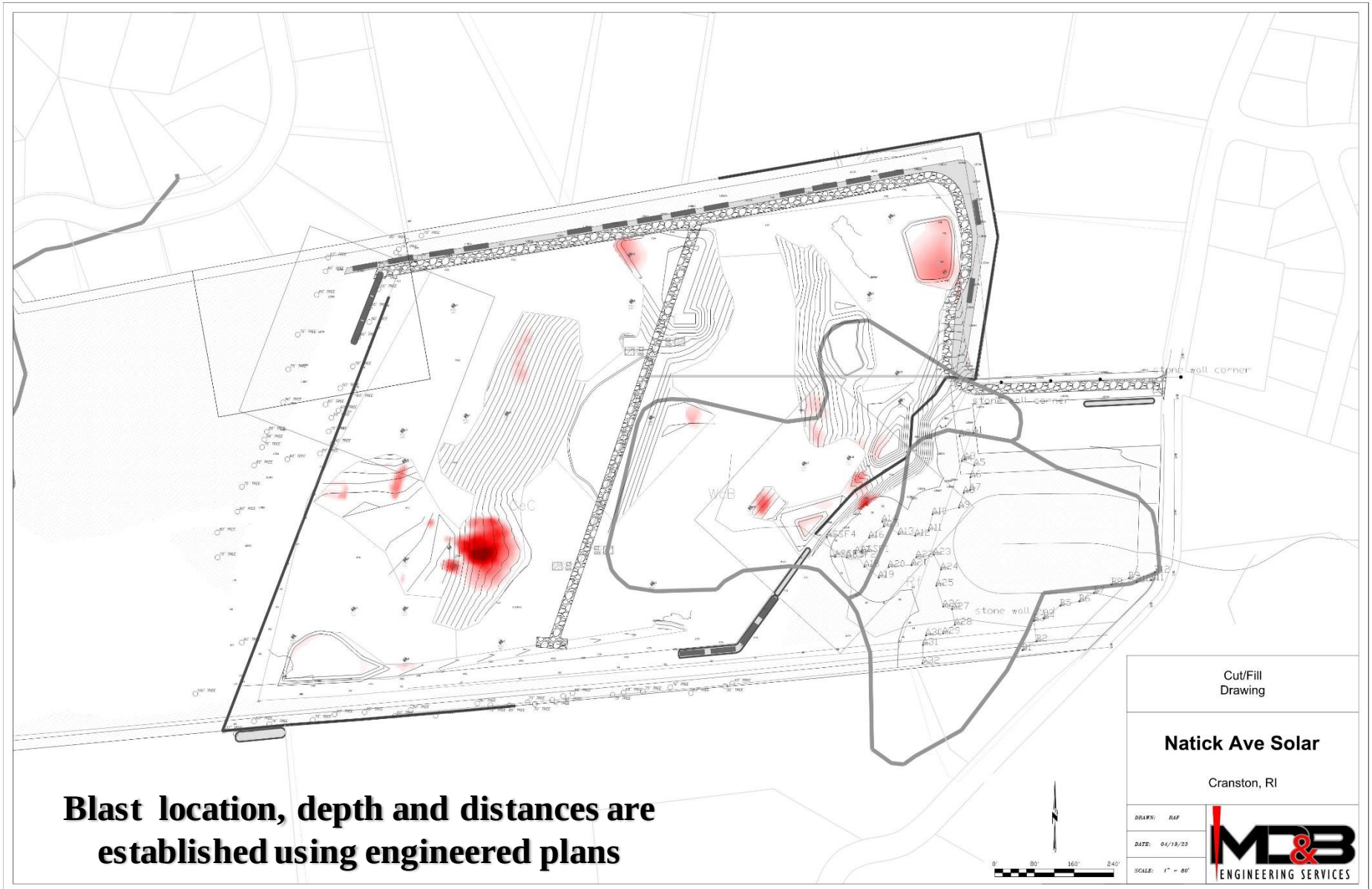
Blast Location

Distance to Structures

Geology

Vibration Estimate Calculations

Pre-Blast Planning

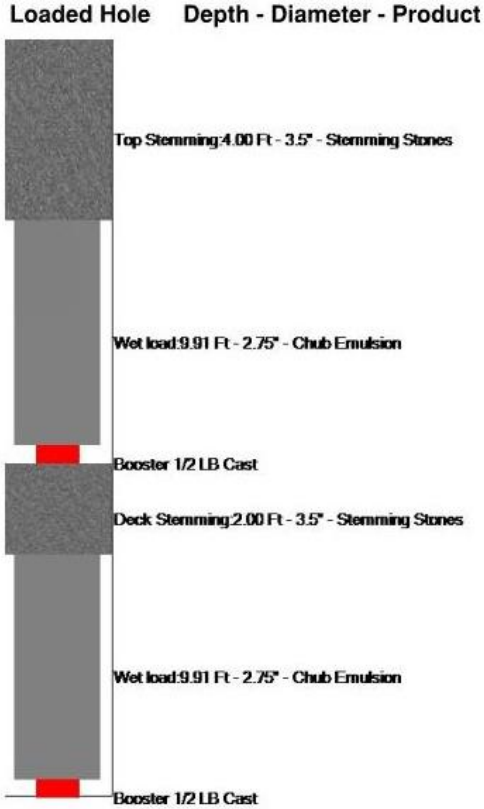


Blast location, depth and distances are established using engineered plans

Pre-Blast Planning

APENDIX A. - Blast Design Plan:

Est. Number Of Holes:	15
Hole Depth:	15.91 Ft
Hole Diameter:	3.5 in
Burden:	6.00 Ft
Spacing:	6.00 Ft
Holes per Delay:	1
Pounds Per Delay:	16.06 Lbs
Pounds Per Hole:	32.11 Lbs
Total est. Pounds:	481.65 Lbs
Powder Factor:	1.51 Lbs/Cy
Decks:	1



Blast Plan Notes:

Vibration Prediction (formula based on Dupont Handbook)

Site Factor (k) :	160	*Ground Constant based on Site/Rock Conidtions*
Distance Ft (d)	75	*Distance to Structure*
Lbs per Delay (w)	16.06	*Lbs explosives per 8 milisecond delay*
Scaled Distance (sd)	18.72	*(sd = d/ square root of w)*
Estimated PPV	1.47	*(ppv = k * sd ^ -1.6)*

Pre-Blast Design Analysis is used to scale the blast geometry and charge, based on proximity to structure and safe vibration limits

Pre-Blast Planning

After the Blast Plan is finalized a pattern of holes is drilled into the ledge. Explosive charges are loaded into the drilled holes. The final step in preparing the blast involves the setting of mats to prevent debris from leaving the immediate blast area.

Pre-Blast Planning

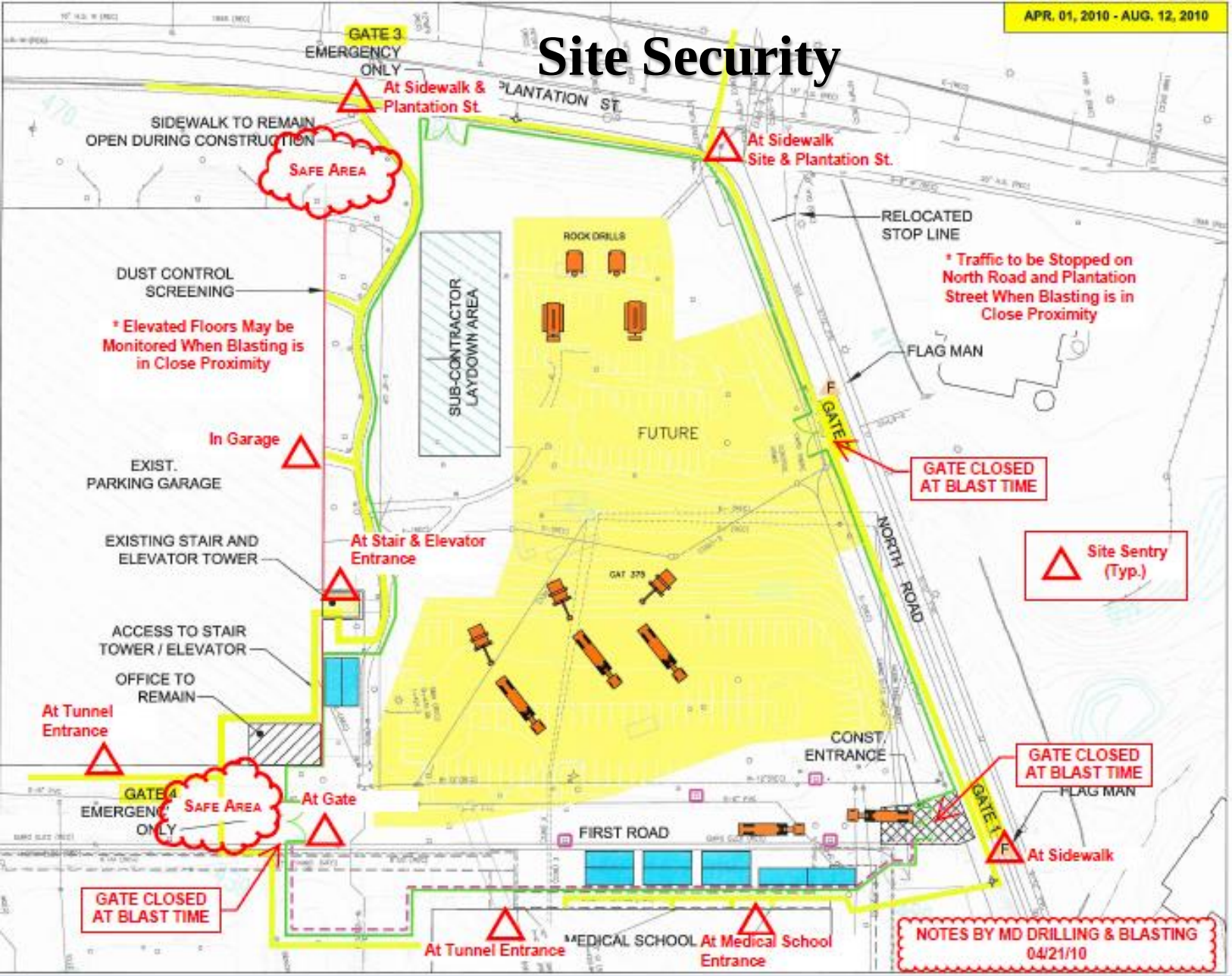
Through out the entire project safety is the first and foremost priority.

Each blast is closely coordinated with local officials and job site management personnel.

People, equipment and traffic on adjacent roadways are monitored and controlled at the time of the blast if necessary, to insure the absolute safety of all.

Site Security

Site Security



Pre-Blast Planning

Drilling & Blasting

Measuring Ground and Air Response

Ground Response

When an explosive is detonated in rock, energy is released. Some of that energy is absorbed by the rock and transmitted through the ground in the form of a seismic wave.

As the seismic wave travels outward from its source, ground particles respond. These particles move back and forth ever so slightly, quickly returning back to their original rest position after the seismic wave passes. We sense this oscillation as vibration.

Air Response (AIR OVERPRESSURE)

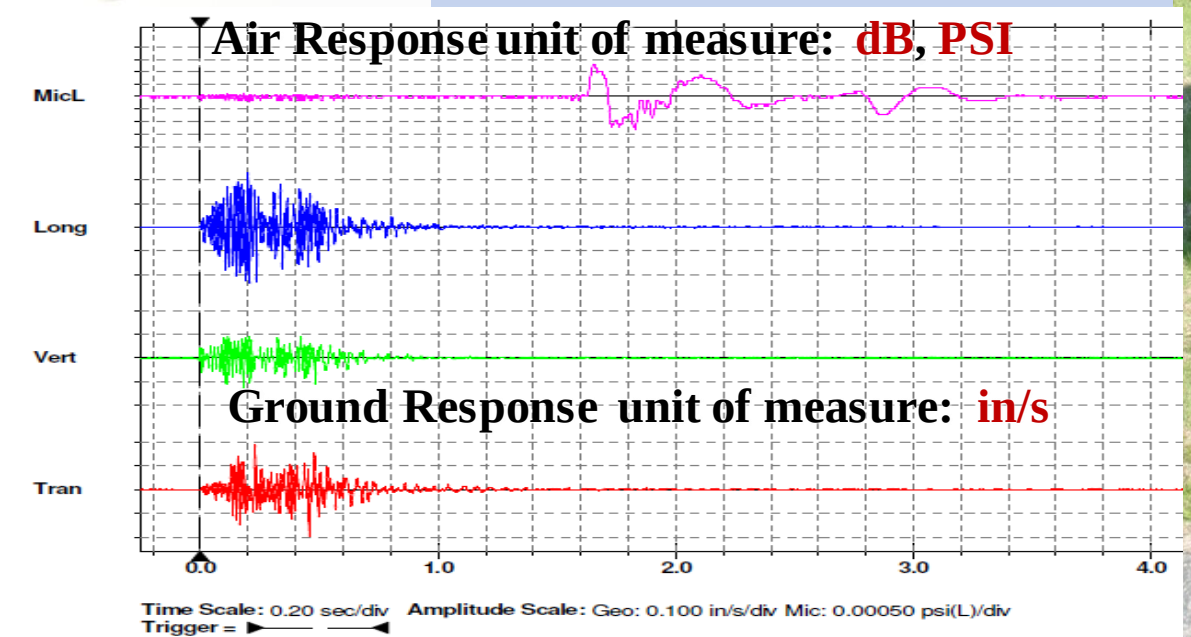
An airborne pressure pulse resulting from the detonation of explosives. Air blast may be caused by the displacement of the material being blasted or the release of expanding gas into the air.

Can best be described as distant thunder.

Measuring Ground and Air Response

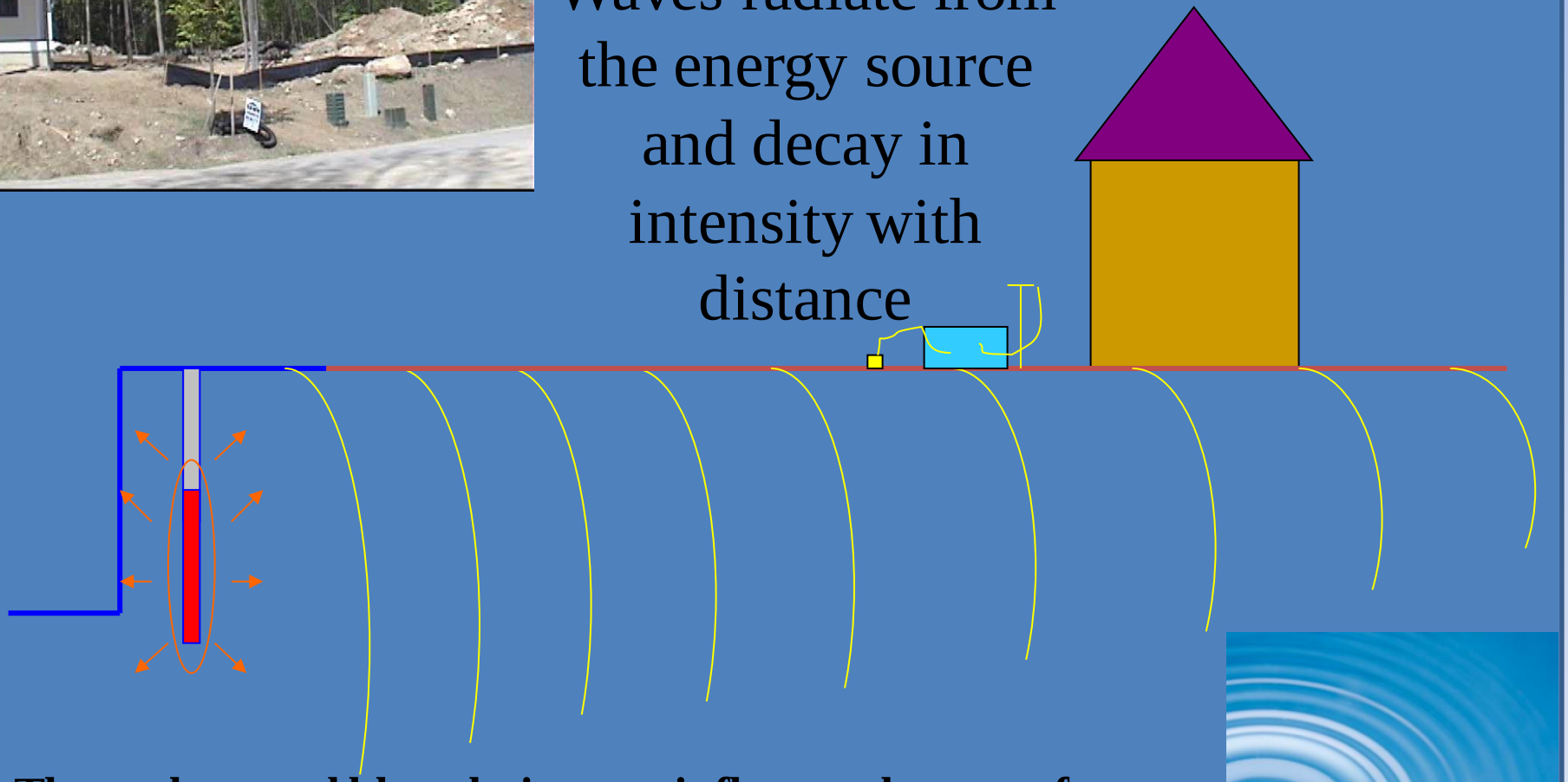
Seismograph Monitoring

Provides a permanent record documenting air and ground response



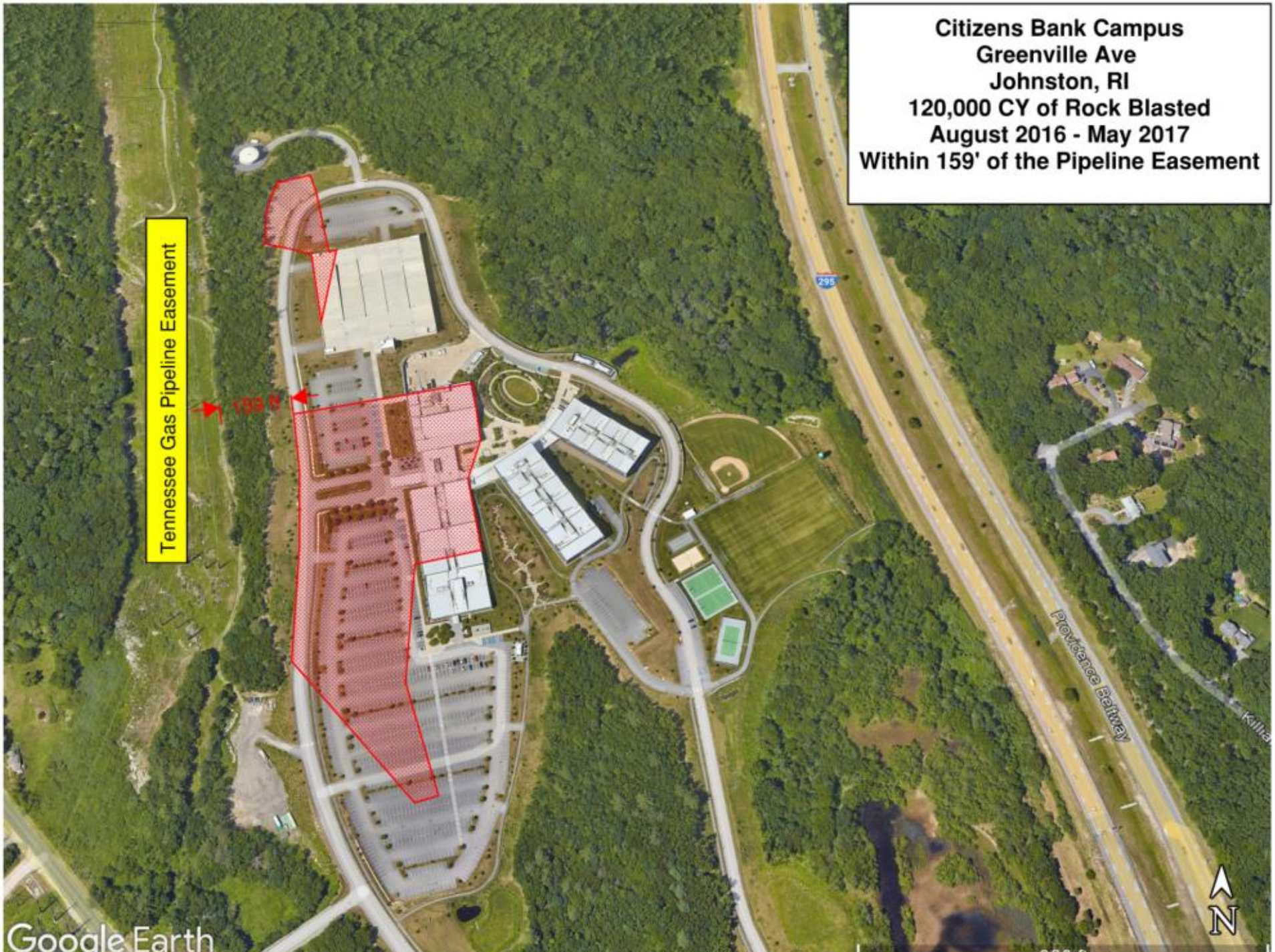
Measuring Ground and Air Response

Waves radiate from the energy source and decay in intensity with distance



The geology and blast design can influence the rate of deterioration, but as a rule, vibration decreases to one-third of its former value every time the distance doubles.

Projects in Close Proximity to the Tennessee Gas Pipeline


Citizens Bank Campus
Greenville Ave
Johnston, RI
120,000 CY of Rock Blasted
August 2016 - May 2017
Within 159' of the Pipeline Easement
Tennessee Gas Pipeline Easement
159 ft
295
Providence Pike
N
Google Earth


40,0000 Cy OF Rock Blasted
May 2022 - September 2022
Blasted within 57' of the Pipeline
42 Prattling Pond Rd.
44 Prattling Pond Rd.
574 ft
52 Prattling Pond Rd.
420 ft
491 ft
Maximum Charge Weight Hole
Test Blast Area
50 Talcott Forest Rd.
557 ft
195 ft
Tennessee Gas R.O.W
REV
DATE
DESCRIPTION
Proposed Residential Development
402 Farmington Avenue
Farmington, CT
Test Blast Location Plan
Drilling & Blasting
DRAWN: TJB
DATE: 17 MAR 2021
SCALE: 1" = 50'

Tennessee Gas Pipeline Company, L.L.C.
a wholly owned subsidiary of Kinder Morgan, Inc.

Blasting Plan Approval Form/Field Checklist
TENNESSEE GAS PIPELINE

General Information

Blasting Contractor:	Maine Drilling & Blasting	*Blaster's Name*	To Be Determined
Address:	103 Old Windsor Road	*Address:*	Will provide prior
City, State, Zip:	Bloomfield, CT 06002	*City, State, Zip:*	to project start.
Phone:	860-242-7419	*Phone:*	( )
		License Number	

Project Summary: (Why are you blasting in this area?)

Blasting mass rock and trench rock for proposed multi-story residential structure.

Exact Location of Blasting: 402 Farmington Avenue, Farmington, CT 06032
Approx. center of blasting area: 41.731775, -72.803403

Blasting Information

• *Explosive Type*	Metered bulk emulsion and blasting agent
Total amount of explosives used.	TBD
• *Maximum charge per hole.*	77.2 lb
• *Maximum charge per delay.*	53.2 lb
• *Delay Interval*	17 ms between rows, 8 ms between holes/ decks
Delay Type (include manufacturer)	Dyno Nobel NONEL EZTL
Initiating Method: (electric or non-electric)	Non-electric
Type of circuit	N/A
• *Distance to nearest above ground structure*	135 ft
Distance to nearest below ground structure	
• *Distance to nearest pipeline (TGP)*	Closest point is 50 ft to R.O.W., 63 ft to pipe approx.
* *TGP Line Number*	
* *TGP Station Plus (nearest to blast)*	
• *Type of material blasted (soil, rock)*	Rock with some soil overburden
Shot Padding to be used: (if applicable)	Rubber tire blasting mats
• *Number of seismographs proposed*	4
• *Will seismograph be placed near TGP pipeline?*	Yes, 1 at ground surface
• *Proposed date of blast*	TBD, Contingent upon Town approval

• This is *information that must be provided.*
* *Provided by Pipeline*

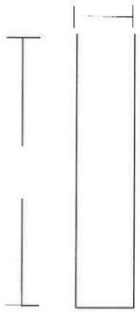
Blaster's Signature _____ *Date* _____

Sketch proposed blast pattern including number of holes, burden and spacing distance, delay pattern, and if decking is used. Also, include distance and direction between TGP pipeline and nearest blast hole. Also, sketch a hole profile including dimensions, stemming, and charges.

Remarks:

Refer to Maine Drilling and Blasting Blast Plan dated February 25, 2021 for general loading information

Blast Hole Profile:



Questions?