CITY OF LEE'S SUMMIT

PUBLIC WORKS DEPARTMENT / ENGINEERING DIVISION
220 SE Green Street
LEE'S SUMMIT, MISSOURI 64063

(816) 969-1800 FAX (816) 969-1810

BLASTING PERMIT APPLICATION

DATE: 04/17/2023

6 COPIES: **CONTRACTOR**
PUBLIC WORKS SECRETARY OFFICE FILE
FIRE ALARM OFFICE - DISPATCH
FIRE CHIEF, FIRE DEPARTMENT
BATTALION CHIEF, FIRE DEPARTMENT
ORIGINAL: **PUBLIC WORKS INSPECTIONS PROJECT FILE**

1. LEGAL DESCRIPTION OF PROPERTY UPON WHICH BLASTING IS TO BE PERFORMED:
SEC 31 TWP 48 RNG 31; PT OF S 1/2 NW 1/2 LY E OF LEES SUMMIT RD, SEC 31 TWP 48 RNG 31; S 1/2 OF NW 1/4 LY BETWEEN MO PAC RR AND LEES SUMMIT RD

2. LOCATION OF BLASTING SITE: Construction blasting will take place West of Sloan Street between Tudor & Victoria Drive

3. NAME/ADDRESS OF APPLICANT (if applicant is a corporation, list State of incorporation):
NAME Eds Drilling and Blasting
ADDRESS 2809 Hwy A
CITY/STATE/ZIP Washington, MO 63090

4. TELEPHONE NUMBER OF APPLICANT
a. Daytime Telephone: 816-898-5219
b. Emergency Telephone: 816-898-5219

5. NAME OF RESPONSIBLE PARTY (individual name):
Tom Dowler

6. NAME(S) OF QUALIFIED BLASTER(S) (include individual's age and years of experience):
JakeOsborn , Kaleb Clark, Thomas Dowler, Zach Rufenacht

Contact number of blaster: Kaleb 785-331-5541, Zach 660-351-4219, Jake 660-492-9097, Tom 816-898-5219

7. APPROVED INSURANCE CERTIFICATE PROVIDED? X YES ___ NO
a. INSURANCE POLICY EFFECIVE DATES 08/01/2022-08/01/2023
b. BLASTING COVERAGE IS A MINIMUM OF $2,000,000 X YES ___ NO

8. PURPOSE OF BLASTING (BE SPECIFIC): Construction blasting will take place for grading & utility excavations.

9. DOES APPLICANT HAVE THE LEGAL RIGHT TO ENTER UPON THE AFFECTED AREA?
Yes, attached
(PROVIDE DOCUMENTATION AS ATTACHMENT)

10. APPLICANT MUST PROVIDE ACCURATE DRAWINGS OF A SCALE OF NOT LESS THAN ONE INCH TO 100 FEET CLEARLY SHOWING:

    a. The layout of the blasting area and land to be affected during the period of the permit including all boundaries of the land to be affected.

    b. Location of all structures in the permit area.

    c. All easements of record, public and private, which cross the permit area.

11. HAS THE APPLICANT, A SUBSIDIARY, AFFILIATE, OR PERSONS CONTROLLED BY OR UNDER COMMON CONTROL WITH THE APPLICANT, EVER HELD A BLASTING PERMIT IN ANY STATE OR POLITICAL SUBDIVISION WHICH IN THE FIVE-YEAR PERIOD PRIOR TO THE DATE OF SUBMISSION OF THIS APPLICANT BEEN SUSPENDED OR REVOKED?
    __ YES X NO

    GIVE A DETAILED EXPLAINATION IF YES N/A

12. PRESENCE OF DAY BOX: __ YES X NO

13. DAY BOX MUST BE REMOVED FROM THE SITE AT THE END OF THE DAY UNLESS PRIOR APPROVAL HAS BEEN GRANTED BY THE FIRE DEPARTMENT.

13. **EXACT LOCATION OF DAY BOX:** N/A
    Daily tailgate service from Buckley Powder Co. No onsite storage

14. MATERIAL USED IN BLASTING:
    a. Type and class of explosives: Titan 1000 G Emulsion 1.5D, Trojan Cast Boosters 1.1D, Non-Electric Detonators 1.4B

    b. Amount (lbs.) of each type: 6000 lbs Titan 1000 Emulsion

    c. Type of detonators: Non-electric? X Electric ? ____

15. SEISMOGRAPHS:
    a. Must be provided for each blast. This includes documentation and seismogram provided upon request by the City Engineer.

    b. Type of unit in use: White Mini Seis III
    c. Serial number of seismograph: 8231, 7360, 7762, 7380
    Is unit self triggering? X Yes __ No
    Is unit self calibrated? X Yes __ No
    Name of person with seismograph: Zac Allen, Kaleb Clark, Thomas Dowler, Zach Rufenacht
    Provide documentation.

16. **SPECIAL CONDITIONS**
    The following rules shall be followed:

    a. NO BLASTING SHALL TAKE PLACE AT ANY SITE WITHOUT FIRST NOTIFYING THE FIRE DEPARTMENT ALARM OFFICE AT 969-7360, AND PUBLIC WORKS INSPECTIONS AT **969-1827**.

b. BLASTING MAY BE PERFORMED DURING DAYLIGHT HOURS ONLY, NO EXCEPTION.

c. NO SMOKING allowed within 50 feet of any location where explosives are being handled or stored. This includes no fire or flame of any type.

d. During the time of loading explosives into holes, the blast site shall be barred to all but those authorized persons engaged in the drilling and loading operations or otherwise authorized to enter the site for specific associated reason. The blast site shall be guarded and posted.

e. Post City blasting permit in a visible location on site; an approved blaster on file with this office must be present during all blasting activity and present certificate authorization and photographic identification upon request by the **City of Lee's Summit**. Please report any loss of blasting permit to the **Public Works Department** immediately.

f. The City of Lee's Summit shall have the right to enter construction/blasting sites before, during, or after blasting.

g. False information provided to the **Public Works Department** on this application sheet will result in revocation of permit and the site closed by the **City of Lee's Summit**.

h. The person(s) in charge of blasting on site must follow all city, state and federal requirements. Any person or company found not following requirements will have permits revoked and the site closed by the **City of Lee's Summit**.

i. When blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph or stream utilities, the blaster shall notify the appropriate representative of such utilities at least 24 hours in advance of blasting specifying the location and intended time of such blasting.

j. Precautions shall be taken to prevent the premature detonation of explosive materials from lightning, radio frequency energy, extraneous electricity or static electricity caused by dust or snow storms, low humidity or mechanical conditions. Such precautions shall include the suspension of blasting operations and removal of persons from the blasting area during the approach and progress of a thunderstorm.

k. Tools used for the opening of containers of explosive materials shall be made of non-sparking materials.
EXCEPTION: box cutters or knifes of metal are allowed for opening paper, plastic or fiberboard containers.

l. Empty boxes and paper, plastic, detonation cord or fiber packing materials which have previously contained materials shall not be reused, and shall be collected, removed and disposed of.

m. Blasting permits will be issued by **the Public Works Department** for 90 day periods only. **If any changes are made which affect the information given on the initial permit application,** the initial permit will become null and void, therefore another application must be made including all original fees.

n. Completed applications and plans shall be submitted to the Pubic Works Inspections Supervisor for review. Applicants will be notified when plan review is completed as to

further information needed or approval. Blasting permits will be issued upon appropriate review by the **Public Works Department** and the payment of permit fee. A minimum 24 hour notice should be expected for an approval to be returned to the contractor.

o. **All storage of explosives in excess of that amount required for one day's use requires a permit to be issued by the Fire Department. The day box storage of that amount required for one day's use as approved in the Blasting Permit application shall be in accordance with all City, State, and Federal regulations.**

p. The blasting regulation can be found on the City of Lee's Summit's web page at www.lees-summit.mo.us.

Applicant acknowledges that he has read and agrees to comply with the Blasting Regulations in the Design and Construction Manual of the City of Lee's Summit.

Applicant's Signature: _____ Date: 04/17/2023

Approved by: _____ Issued Date: _____

Permit Number: _____ Expiration Date: _____

Denied by: _____ Date: _____

Reason Denied: _____

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 07/12/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER J M Miller, Inc. 301 Airport Road Indiana PA 15701	**CONTACT NAME:** Liv Stossel **PHONE (A/C, No, Ext):** (724) 349-8850 **FAX (A/C, No):** (724) 349-8852 **E-MAIL ADDRESS:** ostossel@jmmillerinc.com
INSURED Ed's Drilling & Blasting Co 2809 Highway A, Suite A Washington MO 63090	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** **INSURER A :** Lancer Insurance Company — _26077 **INSURER B :** Carolina Casualty Insurance Company — 10510 **INSURER C :** Imperium Insurance Company — 35408 **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** 22-23 Ed's **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC [ ] OTHER:			GL803767#4	08/01/2022	08/01/2023	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG Employee Benefits	$ 1,000,000 $ 100,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $ 1,000,000
A	**AUTOMOBILE LIABILITY** [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY [X] 19 [ ]			BA803729#4	08/01/2022	08/01/2023	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Underinsured motorist BI	$ 1,000,000 $ $ $ $ 50,000
A	[ ] **UMBRELLA LIAB** [X] OCCUR [X] **EXCESS LIAB** [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			XS803845#4	08/01/2022	08/01/2023	Split limit EACH OCCURRENCE AGGREGATE 	$ 4,000,000 $ 4,000,000 $
B	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [Y] **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		CCWC308704	08/01/2022	08/01/2023	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
C	Inland Marine			MNG-IIC-IM-0000144-02	08/01/2022	08/01/2023	Scheduled Equipment	$14,216,833

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

City of Lees Summit
2200 SE Green
Lee's Summit MO 64063

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Missouri Department of Public Safety
Missouri Division of Fire Safety
Investigations and Explosives Unit
P.O. Box 844
Jefferson City, MO 65102
(573) 751-2930 Fax (573) 526-4600

LICENSED BLASTER

Dear Blaster:

You have been approved as a Licensed Blaster by the Missouri State Fire Marshal. Receipt of this license verifies that the holder meets the necessary qualifications as defined in the Missouri Blasting Safety Act, RSMO 319.303 to 319.345 and the Code of State Regulation 11 CSR 40-7.010.

For your convenience a wallet size license is also enclosed. When conducting a blast one of these documents is requird to be carried with you and presented upon request.

If you have any questions please contact this office at (573) 751-2930 or e-mail firesafe@dfs.dps.mo.gov.

Missouri Department of Public Safety
Missouri Division of Fire Safety
PO Box 844 * Jefferson City, MO 65102

LICENSED BLASTER

Performs duties as a Licensed Blaster as authorized by the Missouri State Fire Marshal, Missouri Blasting Safety Act, RSMo. 319.303 to 319.345, Code of State Regulation 11 CSR 40-7.010.

Name: **Thomas Dowler**
License Number: **420**
Expires: **4/26/2024**

State Fire Marshal:

Missouri Department of Public Safety
Missouri Division of Fire Safety
PO Box 844
Jefferson City, MO 65102

LICENSED BLASTER

Performs duties as a Licensed Blaster as authorized by the Missouri State Fire Marshal, Missouri Blasting Safety Act 319.303 - 319.345 RSMo. and 11 CSR 40-7.010.

NAME: Jacob Alexander Osborn

LICENSE NUMBER: 693

EXPIRES: 8/4/2024

State Fire Marshal:

Missouri Department of Public Safety
Missouri Division of Fire Safety
PO Box 844
Jefferson City, MO 65102

LICENSED BLASTER

Performs duties as a Licensed Blaster as authorized by the Missouri State Fire Marshal, Missouri Blasting Safety Act 319.303 - 319.345 RSMo. and 11 CSR 40-7.010.

NAME: Kaleb T Clark

LICENSE NUMBER: 499

EXPIRES: 3/9/2024

State Fire Marshal:

Missouri Department of Public Safety
Missouri Division of Fire Safety
PO Box 844
Jefferson City MO 65102

LICENSED BLASTER

Performs duties as a Licensed Blaster as authorized by the Missouri State Fire Marshal, Missouri Blasting Safety Act 319 303 - 319 345 RSMo and 11 CSR 40-7 010

NAME: Zachary Rufenacht

LICENSE NUMBER: 699

EXPIRES: 2/22/2025

State Fire Marshal

White Industrial Seismology, Inc.
1206 Schifferdecker • P.O. Box 1256
Joplin, MO 64802-1256
417-624-0164 ♦ 800-641-4538 ♦ Fax: 417-624-9416
www.whiteseis.com

Final Calibration Certificate

Instrument Model: MS III 10 IPS Instrument SN: 7380 Seismic SN: 7380 Acoustic SN: 7380

Seismic Results (in/s)

Frequency	Input	Radial	Vertical	Transverse	Tolerance	Pass/Fail
2	1.00	0.900	0.900	0.900	+5% to -3dB	Passed
4	1.00	1.00	0.990	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
10	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
30	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
60	1.00	1.00	1.00	1.01	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
125	1.00	0.970	0.980	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
200	1.00	0.860	0.880	0.880	+5% to -3dB	Passed
250	1.00	0.720	0.750	0.760	+5% to -3dB	Passed

Acoustic Results

Frequency	Input	Acoustic	Tolerance	Pass/Fail
2	134.0	131.2	-3 dB, +/-1 dB	Passed
3	134.0	132.7	-1 dB, +/-1 dB	Passed
4	134.0	133.3	+/-1 dB	Passed
10	134.0	134.1	+/-1 dB	Passed
30	134.0	134.1	+/-1 dB	Passed
60	134.0	134.0	+/-1 dB	Passed
100	134.0	134.0	+/-1 dB	Passed
125	134.0	133.9	+/-1 dB	Passed
200	134.0	132.8	+1 dB to -3 dB	Passed
250	134.0	131.4	+1 dB to -3 dB	Passed

Statement

I certify that all seismic and acoustic components of this instrument were calibrated on a shake table or electronically, and in an acoustic chamber, at the listed input level and frequencies. The results are within the International Society of Explosives Engineers (ISEE) Performance Specifications for Blasting Seismographs 2017 Edition.

References

Signal Generator for shake table- Model BK Precision 4040B Serial # 365L17102, Shake table with acoustic chamber- Model ST-1S serial # 9031, Shake table reference- Vibe metrics Accelerometer Model 1020s serial # 3367, Acoustic Reference- Piston Phone is B & K Type 4228. Serial number 1504026. All references are traceable to NIST.

Notes

Frequencies at and above 60 Hz were tested electronically in order to remove shake table distortion error.

Date: 2022-06-01 Technician (Leslie Haynes): _____

White Industrial Seismology, Inc.
1206 Schifferdecker • P.O. Box 1256
Joplin, MO 64802-1256
417-624-0164 ♦ 800-641-4538 ♦ Fax: 417-624-9416
www.whiteseis.com

Phase Response Document

Instrument Model: MS III 10 IPS Instrument SN: 7380 Seismic SN: 7380

Radial	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.28	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	1.63	0.900	5.88%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	0.97	0.450	-10.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	258.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	203.05	0.850	0.00%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	339.66	0.490	-2.00%	F amplitude x 0.50 +/- 10%	Pass

Vertical	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.29	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	1.63	0.910	7.06%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	0.98	0.450	-10.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	268.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	210.92	0.850	0.00%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	352.82	0.490	-2.00%	F amplitude x 0.50 +/- 10%	Pass

Transverse	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.28	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	1.62	0.910	7.06%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	0.97	0.450	-10.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	270.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	212.49	0.860	1.18%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	355.46	0.480	-4.00%	F amplitude x 0.50 +/- 10%	Pass

Date: 2022-06-01 Technician (Leslie Haynes): _____

White Industrial Seismology, Inc.
1206 Schifferdecker • P.O. Box 1256
Joplin, MO 64802-1256
417-624-0164 ♦ 800-641-4538 ♦ Fax: 417-624-9416
www.whiteseis.com

As Found Certificate

Instrument Model: MS III 10 IPS Instrument SN: 7380 Seismic SN: 7380 Acoustic SN: 7380

Seismic Results (in/s)

Frequency	Input	Radial	Vertical	Transverse	Tolerance	Pass/Fail
2	1.00	0.870	0.900	0.870	+5% to -3dB	Passed
4	1.00	0.990	0.990	0.980	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
10	1.00	0.990	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
30	1.00	0.990	0.990	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
60	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
125	1.00	0.970	0.980	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
200	1.00	0.860	0.880	0.880	+5% to -3dB	Passed
250	1.00	0.730	0.750	0.760	+5% to -3dB	Passed

Acoustic Results

Frequency	Input	Acoustic	Tolerance	Pass/Fail
2	134.0	131.2	-3 dB, +/-1 dB	Passed
3	134.0	132.7	-1 dB, +/-1 dB	Passed
4	134.0	133.3	+/-1 dB	Passed
10	134.0	134.1	+/-1 dB	Passed
30	134.0	134.1	+/-1 dB	Passed
60	134.0	134.0	+/-1 dB	Passed
100	134.0	134.0	+/-1 dB	Passed
125	134.0	133.9	+/-1 dB	Passed
200	134.0	132.8	+1 dB to -3 dB	Passed
250	134.0	131.4	+1 dB to -3 dB	Passed

Statement

I certify that all seismic and acoustic components of this instrument were checked as found on a shake table, and in an acoustic chamber, at the listed input level and frequencies. The results are within the International Society of Explosives Engineers (ISEE) Performance Specifications for Blasting Seismographs 2011 Edition.

References

Signal Generator for shake table- Model BK Precision 4040B Serial # 365L17102, Shake table with acoustic chamber- Model ST-1S serial # 9031, Shake table reference- Vibe metrics Accelerometer Model 1020s serial # 3367, Acoustic Reference- Piston Phone is B & K Type 4228. Serial number 1504026. All references are traceable to NIST.

Notes

Frequencies at and above 60 Hz were tested electronically in order to remove shake table distortion error.

Date: 2022-06-01

Technician (Leslie Haynes): _____

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1206 Schifferdecker • P.O. Box 1256
Joplin, MO 64802-1256
417-624-0164 ♦ 800-641-4538 ♦ Fax: 417-624-9416
www.whiteseis.com

Final Calibration Certificate

Instrument Model: MS III 10 IPS Instrument SN: 7762 Seismic SN: 7762 Acoustic SN: 7762

Seismic Results (in/s)

Frequency	Input	Radial	Vertical	Transverse	Tolerance	Pass/Fail
2	1.00	0.900	0.890	0.900	+5% to -3dB	Passed
4	1.00	0.990	0.990	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
10	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
30	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
60	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
125	1.00	1.02	1.01	1.01	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
200	1.00	0.900	0.890	0.890	+5% to -3dB	Passed
250	1.00	0.730	0.730	0.720	+5% to -3dB	Passed

Acoustic Results

Frequency	Input	Acoustic	Tolerance	Pass/Fail
2	134.0	131.1	-3 dB, +/-1 dB	Passed
3	134.0	133.3	-1 dB, +/-1 dB	Passed
4	134.0	133.8	+/-1 dB	Passed
10	134.0	134.1	+/-1 dB	Passed
30	134.0	134.0	+/-1 dB	Passed
60	134.0	134.1	+/-1 dB	Passed
100	134.0	134.2	+/-1 dB	Passed
125	134.0	134.2	+/-1 dB	Passed
200	134.0	133.2	+1 dB to -3 dB	Passed
250	134.0	131.4	+1 dB to -3 dB	Passed

Statement

I certify that all seismic and acoustic components of this instrument were calibrated on a shake table or electronically, and in an acoustic chamber, at the listed input level and frequencies. The results are within the International Society of Explosives Engineers (ISEE) Performance Specifications for Blasting Seismographs 2017 Edition.

References

Signal Generator for shake table- Model BK Precision 4040B Serial # 365L17102, Shake table with acoustic chamber- Model ST-1S serial # 9031, Shake table reference- Vibe metrics Accelerometer Model 1020s serial # 3367, Acoustic Reference- Piston Phone is B & K Type 4228. Serial number 1504026. All references are traceable to NIST.

Notes

Frequencies at and above 60 Hz were tested electronically in order to remove shake table distortion error.

Date: 2022-11-03 Technician (Leslie Haynes): _____

White Industrial Seismology, Inc.
1206 Schifferdecker • P.O. Box 1256
Joplin, MO 64802-1256
417-624-0164 ♦ 800-641-4538 ♦ Fax: 417-624-9416
www.whiteseis.com

Phase Response Document

Instrument Model: MS III 10 IPS Instrument SN: 7762 Seismic SN: 7762

Radial	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.29	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	1.64	0.900	5.88%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	0.98	0.460	-8.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	259.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	203.83	0.890	4.71%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	340.97	0.460	-8.00%	F amplitude x 0.50 +/- 10%	Pass

Vertical	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.31	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	1.66	0.900	5.88%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	1.00	0.460	-8.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	257.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	202.26	0.890	4.71%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	338.34	0.460	-8.00%	F amplitude x 0.50 +/- 10%	Pass

Transverse	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.28	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	1.63	0.910	7.06%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	0.97	0.450	-10.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	256.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	201.47	0.880	3.53%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	337.02	0.460	-8.00%	F amplitude x 0.50 +/- 10%	Pass

Date: 2022-11-03

Technician (Leslie Haynes): _____

White Industrial Seismology, Inc.
1206 Schifferdecker • P.O. Box 1256
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417-624-0164 ♦ 800-641-4538 ♦ Fax: 417-624-9416
www.whiteseis.com

As Found Certificate

Instrument Model: MS III 10 IPS Instrument SN: 7762 Seismic SN: 7762 Acoustic SN: 7762

Seismic Results (in/s)

Frequency	Input	Radial	Vertical	Transverse	Tolerance	Pass/Fail
2	1.00	0.890	0.870	0.890	+5% to -3dB	Passed
4	1.00	0.990	0.990	0.980	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
10	1.00	1.00	1.01	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
30	1.00	1.00	1.01	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
60	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
125	1.00	1.02	1.01	1.01	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
200	1.00	0.900	0.890	0.890	+5% to -3dB	Passed
250	1.00	0.730	0.730	0.720	+5% to -3dB	Passed

Acoustic Results

Frequency	Input	Acoustic	Tolerance	Pass/Fail
2	134.0	131.1	-3 dB, +/-1 dB	Passed
3	134.0	133.5	-1 dB, +/-1 dB	Passed
4	134.0	134.0	+/-1 dB	Passed
10	134.0	134.3	+/-1 dB	Passed
30	134.0	134.3	+/-1 dB	Passed
60	134.0	134.1	+/-1 dB	Passed
100	134.0	134.2	+/-1 dB	Passed
125	134.0	134.2	+/-1 dB	Passed
200	134.0	133.2	+1 dB to -3 dB	Passed
250	134.0	131.4	+1 dB to -3 dB	Passed

Statement

I certify that all seismic and acoustic components of this instrument were checked as found on a shake table, and in an acoustic chamber, at the listed input level and frequencies. The results are within the International Society of Explosives Engineers (ISEE) Performance Specifications for Blasting Seismographs 2017 Edition.

References

Signal Generator for shake table- Model BK Precision 4040B Serial # 365L17102, Shake table with acoustic chamber- Model ST-1S serial # 9031, Shake table reference- Vibe metrics Accelerometer Model 1020s serial # 3367, Acoustic Reference- Piston Phone is B & K Type 4228. Serial number 1504026. All references are traceable to NIST.

Notes

Frequencies at and above 60 Hz were tested electronically in order to remove shake table distortion error.

Date: 2022-11-03

Technician (Leslie Haynes): _____

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Final Calibration Certificate

Instrument Model: MS III 10 IPS Instrument SN: 7360 Seismic SN: 7380 Acoustic SN: 7360

Seismic Results (in/s) Frequency	Input	Radial	Vertical	Transverse	Tolerance	Pass/Fail
2	1.00	0.900	0.920	0.910	+5% to -3dB	Passed
4	1.00	0.990	0.990	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
10	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
30	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
60	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
125	1.00	0.980	0.990	0.980	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
200	1.00	0.870	0.880	0.860	+5% to -3dB	Passed
250	1.00	0.750	0.750	0.730	+5% to -3dB	Passed

Acoustic Results Frequency	Input	Acoustic	Tolerance	Pass/Fail
2	134.0	131.6	-3 dB, +/-1 dB	Passed
3	134.0	133.1	-1 dB, +/-1 dB	Passed
4	134.0	133.6	+/-1 dB	Passed
10	134.0	134.1	+/-1 dB	Passed
30	134.0	134.0	+/-1 dB	Passed
60	134.0	134.0	+/-1 dB	Passed
100	134.0	134.0	+/-1 dB	Passed
125	134.0	133.9	+/-1 dB	Passed
200	134.0	132.8	+1 dB to -3 dB	Passed
250	134.0	131.4	+1 dB to -3 dB	Passed

Statement

I certify that all seismic and acoustic components of this instrument were calibrated on a shake table or electronically, and in an acoustic chamber, at the listed input level and frequencies. The results are within the International Society of Explosives Engineers (ISEE) Performance Specifications for Blasting Seismographs 2017 Edition.

References

Signal Generator for shake table- Model BK Precision 4040B Serial # 365B14181, Shake table with acoustc chamber - Model ST-1S serial # 9013, Shake table reference- Vibe metrics Accelerometer Model 1020s serial # 3367, Acoustic Reference - Piston Phone is B & K Type 4228. Serial number 1504026. All references are traceable to NIST.

Notes

Frequencies at and above 60 Hz were tested electronically in order to remove shake table distortion error.

Date: 2022-09-14 Technician (Bowen Trower): Bowen Trower

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Phase Response Document

Instrument Model: MS III 10 IPS Instrument SN: 7360 Seismic SN: 7380

Radial	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.81	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	2.30	0.800	-5.88%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	1.38	0.530	6.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	264.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	207.77	0.860	1.18%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	347.56	0.490	-2.00%	F amplitude x 0.50 +/- 10%	Pass

Vertical	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.72	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	2.18	0.810	-4.71%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	1.31	0.520	4.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	264.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	207.77	0.860	1.18%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	347.56	0.490	-2.00%	F amplitude x 0.50 +/- 10%	Pass

Transverse	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.77	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	2.25	0.810	-4.71%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	1.35	0.520	4.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	260.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	204.62	0.850	0.00%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	342.29	0.500	0.00%	F amplitude x 0.50 +/- 10%	Pass

Date: 2022-09-14

Technician (Bowen Trower): Bowen Trower

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As Found Certificate

Instrument Model: MS III 10 IPS Instrument SN: 7360 Seismic SN: 7380 Acoustic SN: 7360

Seismic Results (in/s) Frequency	Input	Radial	Vertical	Transverse	Tolerance	Pass/Fail
2	1.00	0.920	0.930	0.920	+5% to -3dB	Passed
4	1.00	0.990	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
10	1.00	0.990	1.01	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
30	1.00	0.990	1.01	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
60	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
125	1.00	0.980	0.990	0.980	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
200	1.00	0.870	0.880	0.860	+5% to -3dB	Passed
250	1.00	0.750	0.750	0.730	+5% to -3dB	Passed

Acoustic Results Frequency	Input	Acoustic	Tolerance	Pass/Fail
2	134.0	131.9	-3 dB, +/-1 dB	Passed
3	134.0	133.4	-1 dB, +/-1 dB	Passed
4	134.0	133.9	+/-1 dB	Passed
10	134.0	134.3	+/-1 dB	Passed
30	134.0	134.2	+/-1 dB	Passed
60	134.0	134.0	+/-1 dB	Passed
100	134.0	134.0	+/-1 dB	Passed
125	134.0	133.9	+/-1 dB	Passed
200	134.0	132.8	+1 dB to -3 dB	Passed
250	134.0	131.4	+1 dB to -3 dB	Passed

Statement

I certify that all seismic and acoustic components of this instrument were checked as found on a shake table, and in an acoustic chamber, at the listed input level and frequencies. The results are within the International Society of Explosives Engineers (ISEE) Performance Specifications for Blasting Seismographs 2017 Edition.

References

Signal Generator for shake table- Model BK Precision 4040B Serial # 365B14181, Shake table with acoustc chamber - Model ST-1S serial # 9013, Shake table reference- Vibe metrics Accelerometer Model 1020s serial # 3367, Acoustic Reference - Piston Phone is B & K Type 4228. Serial number 1504026. All references are traceable to NIST.

Notes

Frequencies at and above 60 Hz were tested electronically in order to remove shake table distortion error.

Date: 2022-09-14 Technician (Bowen Trower): Bowen Trower

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Final Calibration Certificate

Instrument Model: MS III 10 IPS Instrument SN: 8231 Seismic SN: 8231 Acoustic SN: 8231

Seismic Results (in/s)

Frequency	Input	Radial	Vertical	Transverse	Tolerance	Pass/Fail
2	1.00	0.900	0.910	0.900	+5% to -3dB	Passed
4	1.00	0.990	0.980	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
10	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
30	1.00	1.00	1.00	1.00	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
60	1.00	1.00	1.00	1.01	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
125	1.00	0.990	0.990	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
200	1.00	0.870	0.880	0.880	+5% to -3dB	Passed
250	1.00	0.740	0.750	0.750	+5% to -3dB	Passed

Acoustic Results

Frequency	Input	Acoustic	Tolerance	Pass/Fail
2	134.0	131.4	-3 dB, +/-1 dB	Passed
3	134.0	133.2	-1 dB, +/-1 dB	Passed
4	134.0	133.7	+/-1 dB	Passed
10	134.0	134.1	+/-1 dB	Passed
30	134.0	133.9	+/-1 dB	Passed
60	134.0	134.1	+/-1 dB	Passed
100	134.0	134.0	+/-1 dB	Passed
125	134.0	133.9	+/-1 dB	Passed
200	134.0	132.9	+1 dB to -3 dB	Passed
250	134.0	131.5	+1 dB to -3 dB	Passed

Statement

I certify that all seismic and acoustic components of this instrument were calibrated on a shake table or electronically, and in an acoustic chamber, at the listed input level and frequencies. The results are within the International Society of Explosives Engineers (ISEE) Performance Specifications for Blasting Seismographs 2017 Edition.

References

Signal Generator for shake table- Model BK Precision 4040B Serial # 365B14181, Shake table with acoustc chamber - Model ST-1S serial # 9013, Shake table reference- Vibe metrics Accelerometer Model 1020s serial # 3367, Acoustic Reference - Piston Phone is B & K Type 4228. Serial number 1504026. All references are traceable to NIST.

Notes

Frequencies at and above 60 Hz were tested electronically in order to remove shake table distortion error.

Date: 2022-10-05 Technician (Bowen Trower): Bowen Trower

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Phase Response Document

Instrument Model: MS III 10 IPS Instrument SN: 8231 Seismic SN: 8231

Radial	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.79	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	2.27	0.800	-5.88%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	1.36	0.530	6.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	260.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	204.62	0.860	1.18%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	342.29	0.490	-2.00%	F amplitude x 0.50 +/- 10%	Pass

Vertical	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.75	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	2.22	0.800	-5.88%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	1.33	0.520	4.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	265.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	208.56	0.860	1.18%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	348.87	0.490	-2.00%	F amplitude x 0.50 +/- 10%	Pass

Transverse	Frequency Hz	Amplitude in/s	Deviation %	Tolerance	Pass/Fail
Reference F	30.00	1.000		N/A	N/A
F1 (0.707 x A)	1.80	0.707		F1 <= 2.0 Hz	Pass
F2 (1.270 x F1)	2.29	0.800	-5.88%	F amplitude x 0.85 +/- 10%	Pass
F3 (0.760 x F1)	1.37	0.530	6.00%	F amplitude x 0.50 +/- 10%	Pass
F4 (0.707 x A)	263.00	0.707		F4 >= 250 Hz	Pass
F5 (0.787 x F4)	206.98	0.860	1.18%	F amplitude x 0.85 +/- 10%	Pass
F6 (1.3165 x F4)	346.24	0.490	-2.00%	F amplitude x 0.50 +/- 10%	Pass

Date: 2022-10-05

Technician (Bowen Trower): Bowen Trower

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As Found Certificate

Instrument Model: MS III 10 IPS Instrument SN: 8231 Seismic SN: 8231 Acoustic SN: 8231

Seismic Results (in/s)

Frequency	Input	Radial	Vertical	Transverse	Tolerance	Pass/Fail
2	1.00	0.880	0.910	0.900	+5% to -3dB	Passed
4	1.00	0.980	0.990	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
10	1.00	1.02	1.01	1.01	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
30	1.00	1.01	1.01	1.01	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
60	1.00	1.00	1.00	1.01	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
125	1.00	0.990	0.990	0.990	+/- 5% or +/- 0.02 in/s whichever is greater	Passed
200	1.00	0.870	0.880	0.880	+5% to -3dB	Passed
250	1.00	0.740	0.750	0.750	+5% to -3dB	Passed

Acoustic Results

Frequency	Input	Acoustic	Tolerance	Pass/Fail
2	134.0	131.7	-3 dB, +/-1 dB	Passed
3	134.0	133.6	-1 dB, +/-1 dB	Passed
4	134.0	134.2	+/-1 dB	Passed
10	134.0	134.5	+/-1 dB	Passed
30	134.0	134.3	+/-1 dB	Passed
60	134.0	134.1	+/-1 dB	Passed
100	134.0	134.0	+/-1 dB	Passed
125	134.0	133.9	+/-1 dB	Passed
200	134.0	132.9	+1 dB to -3 dB	Passed
250	134.0	131.5	+1 dB to -3 dB	Passed

Statement

I certify that all seismic and acoustic components of this instrument were checked as found on a shake table, and in an acoustic chamber, at the listed input level and frequencies. The results are within the International Society of Explosives Engineers (ISEE) Performance Specifications for Blasting Seismographs 2017 Edition.

References

Signal Generator for shake table- Model BK Precision 4040B Serial # 365B14181, Shake table with acoustc chamber - Model ST-1S serial # 9013, Shake table reference- Vibe metrics Accelerometer Model 1020s serial # 3367, Acoustic Reference - Piston Phone is B & K Type 4228. Serial number 1504026. All references are traceable to NIST.

Notes

Frequencies at and above 60 Hz were tested electronically in order to remove shake table distortion error.

Date: 2022-10-05

Technician (Bowen Trower): Bowen Trower