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APPENDIX A
AMENDED PETITION OF KIC FOR VARIANCE ON APPEAL

KIC’s PROPOSED GRANT OF VARIANCE UPON APPEAL FOR CONSTRUCTION WORK RELATED TO THE CENTRAL 70 PROJECT

The Denver Board of Public Health and Environment ("Board"), after review and consideration of the appeal of Kiewit Infrastructure Company ("KIC") for variance from Denver’s Noise Abatement Ordinance [Denver Revised Municipal Code, Chapter 36], at a special meeting held on September 6, 2018, hereby approves the KIC variance request, contingent upon the conditions prescribed hereinbelow. This grant of variance approval (the “Variance”) employs a series of defined terms which are compiled at Appendix B to the Amended Petition and hereby incorporated herein by reference.

This Variance is granted to KIC for construction work related to the reconstruction/expansion of a portion of Interstate 70, known as the Central 70 Project (the “Project”). The specific terms and requirements of this Variance are as follows:

1. Duration. This Variance shall extend through December 15, 2022 (approximately 52 months).

2. Noise Limitations For General Construction Activity

   (a) For General Construction Activity during Nighttime Hours, Noise levels shall not exceed an hourly average level ($L_{eq}$) of 75 dB(A) or a maximum level ($L_{max}$) of 86 dB(A), measured by an Integrating Sound Level Meter at the nearest Residential Properties Line adjacent to Project right-of-way.

   (b) In no event shall General Construction Activity creating Noise exposure for Residential Properties (including but not limited to single and multi-unit dwellings, hotels, motels, fire stations, primary schools, churches, nursing homes and similar facilities) occur for more than five consecutive nights at a particular job site location. Any General Construction Activity at a particular job site location for five consecutive nights shall be followed by at least two consecutive nights where Noise emitted by construction-related activities at the location is at or below Ambient Background levels.

3. Noise Limitations For Major Structure Activity.

   (a) Major Structure Activity cannot be effectively regulated and is not subject to the General Construction Activity restriction above. For Major Structure Activity creating Noise exposure for Residential Properties, unrestricted noise activity may not occur for more than 30 aggregate Nighttime Hours over the course of three consecutive nights; and in no event shall Major Structure Activity occur for more than three consecutive nights at any Major Structure location (see Appendix E) that impacts Residential Properties. Major Structure Activity that impacts Residential Properties for three consecutive nights shall be followed by at
least four consecutive nights of no such Major Structure Activity at the same location, and Noise emitted by any construction-related activities at said location shall be at or below Ambient Background levels for at least four consecutive nights. KIC shall exercise its reasonable best efforts to complete Major Structure Activity at each Major Structure location within five aggregate nights.

(b) For all Major Structure Activity, KIC shall make hotel accommodations available for occupants of Residential Properties within Eligibility Zones where Nighttime Hours noise levels may exceed an $L_{eq}$ of 75 dB(A) or an $L_{max}$ of 86 dB(A). The Eligibility Zone for each Major Structure shall be determined by a sound study to be conducted by KIC and approved by Denver Department of Public Health and Environment ("DDPHE") staff prior to the required seven day notice provided for in Section 3(c), below. All occupants of Residential Properties within the Eligibility Zone, where Nighttime Hours noise levels are expected to exceed, or do exceed, an hourly average noise level ($L_{eq}$) of 75 dB(A) or a maximum noise level ($L_{max}$) of 86 dB(A), shall be provided access to hotel vouchers and related transportation expense during any Major Structure Activity. During Major Structure Activity, KIC shall conduct noise monitoring to verify the sound study results, and shall expand any Eligibility Zone if actual noise levels outside originally-determined Eligibility Zone boundaries exceed an hourly $L_{eq}$ of 75 dB(A) or a maximum noise level ($L_{max}$) of 86 dB(A).

(c) Not less than seven days prior to commencement of any Major Structure Activity during Nighttime Hours, KIC shall notify individual households located within the Eligibility Zone, Residential Properties owners within the Eligibility Zone, and representatives of each affected Registered Neighborhood Organization.

(i) Notice shall be communicated in both English and Spanish, and shall be in writing (or by email) or by direct personal contact from KIC representatives. Notice shall include the expected start time, expected duration, character of work activity planned, names of available contact persons (for additional information or questions), and any other relevant parameters or programs described in this Variance. Households within any Eligibility Zone shall receive notice regarding their eligibility for hotel vouchers at the same time they are notified of the forthcoming Major Structure Activity.

(d) Although Appendix E refers to current plans for partial modification, full removal, or new construction, so long as Variance requirements continue to be met, changes in construction plans that result in more extensive work at a listed structure, or at another structure than listed in Appendix E, shall not require amendment of this Variance.

(e) Major Structure Activity shall always be subject to Sections 4 and 5, below, notwithstanding KIC’s compliance with this Section 3.

4. Noise Mitigation Requirements/Activity Restraints.

(a) General Construction Activities occurring during Nighttime Hours and adjacent to Residential Properties shall occur behind either an existing sound barrier wall, a Temporary Sound Barrier ("TSB"), or a Project Sound Barrier ("PSB") installation. No such
barriers are required if General Construction Activity occurs at least 15 feet below the top of a Project roadway cut.

(i) The PSB, which is a series of 12-foot high wood/plywood fixed-in-place sound barriers, is installed at the locations displayed in Appendix C. Portions of the as-constructed PSB will remain in place as long as necessary to mitigate Nighttime Hours Noise impacts.

(b) In addition to utilization of sound barriers, as described at sub-paragraph 4(a), above, KIC shall employ reasonable best management practices (“BMPs”) for all Project equipment utilized during Nighttime Hours. Best management practices for Project vehicles and equipment and procedures shall include the following:

(i) Minimizing Nighttime Hours construction durations near Residential Properties and noise-sensitive facilities whenever possible.

(ii) Utilization of quiet-use generators and light-plants for Nighttime Hours construction activities.

(iii) Re-routing of truck traffic away from residential streets when possible.

(iv) Prohibition of compression release engine brakes (jake brakes) on any Project-related vehicles.

(v) Conducting truck loading, unloading, and hauling operations so that noise levels are kept to a minimum, such as, but not limited to, prohibition of slamming of truck beds, truck tailgates, and equipment buckets.

(vi) Idling down equipment motors when the equipment is not in immediate use.

(vii) Configuring equipment to minimize back-up alarm noise where practical and feasible (for example, by using circular movement of trucks).

(viii) Shielding equipment, such as (but not limited to) jackhammers, saws and pavement breakers, through use of the PSB, TSBs or existing sound barrier walls, where practicable.

(ix) Maintaining all equipment to meet manufacturer’s specifications.

(x) Employing additional equipment noise mitigation techniques or materials (for example, lining doors of heavy equipment engine compartments and installing engine and compressor mufflers) consistent with manufacturer requirements.

(xi) Employing Occupational Safety and Health Administration (“OSHA”) backup alarms for all Project machinery or equipment, including either audible self-adjusting ambient-sensitive backup alarms or manually adjustable alarms. Ambient-sensitive
alarms shall automatically adjust to a maximum of 5-10 dB(A) over Ambient Background levels. Manually adjustable alarms shall be set at the lowest setting allowable which assures safe alarm levels (above Ambient Background) for equipment operators and other construction personnel. Installation and use of alarms shall be consistent with the performance requirements of Society of Automotive Engineers standards and OSHA regulations, as revised from time to time.

(xii) Informing employees, contractors and subcontractors performing construction of the general requirements of this Variance and exercising best efforts to ensure that such employees, contractors, and subcontractors utilize BMPs in mitigating Nighttime Hours construction noise.

(xiii) Locating TSBs to reduce noise most effectively.

(xiv) Placing of noise wall posts and panels for the PSB during daytime hours where possible.

(xv) Maintenance of existing sound barrier walls for as long as possible (during construction) to mitigate construction and highway-related noise.

(xvi) Constructing the PSB prior to roadway construction, where possible from a construction staging standpoint.

(xvii) Prohibiting pile driving activity during Nighttime Hours.

(xviii) Employing other/additional BMPs for Project equipment and General Construction Activities, upon the mutual consent of DDPHE and KIC.

(c) In each location where General Construction Activity is conducted during Nighttime Hours, and such activity results in Noise levels which exceed Ambient Background levels, KIC shall utilize approved BMPs to mitigate General Construction Activity Noise impacts to Residential Properties to the maximum extent practicable. KIC shall also:

(i) Empower an Independent Quality Control (“IQC”) Manager to review monitoring and complaints regarding construction noise levels for all General Construction Activity and Major Structure Activity locations. The IQC Manager shall be authorized to shut down relevant Nighttime Hours construction activity, correct or remediate sources of excess Noise, and assure that resumption of Nighttime Hours construction activity occurs only as consistent with allowable Noise levels.

(ii) Provide a noise hotline to be staffed during Nighttime Hours Project Work activity on any day where Nighttime Hours Project Work is occurring. All hotline complaints shall be recorded, investigated, and promptly addressed, as appropriate, by the IQC Manager, and promptly reported to DDPHE representatives in a manner mutually agreed upon by DDPHE and KIC. A response summarizing the investigation and any actions taken shall be provided to each caller in a reasonable manner. Written copies of all complaints and the IQC Manager's responses shall be provided to DDPHE weekly.
(iii) KIC shall also address Noise impacts, for hotels or motels within Eligibility Zones during Major Structure Activity, through one of the following practices: (1) maintaining Noise levels at or below 75 dB(A) L_{eq} or 86 dB(A) L_{max} during Nighttime Hours [as measured at the affected hotel/motel property line]; (2) providing compensation for lost profits (due to reduced patronage) or increased costs related solely to excess noise authorized by this Variance, and/or (3) reaching agreement with adversely impacted hotels/motels to provide alternative redress.

5. Compliance Monitoring.

In addition to monitoring by DDPHE during the term of this Variance, the following monitoring standards/requirements shall be implemented by KIC:

(a) KIC shall perform monitoring sufficient to demonstrate compliance with the requirements of this Variance and to demonstrate to the community that required Nighttime Hours Noise levels are being met.

(b) KIC noise monitoring equipment shall be Type I or Type II Sound Level Meters as defined by the current ANSI Standard S1.4. Documentation of annual certification of calibration for all sound level meters, microphones, and acoustical calibrators shall be available for review by DDPHE.

(c) KIC shall collect all noise measurements using ANSI guidelines for community noise monitoring, including the following general guidelines:

(i) Field calibration - calibration of each sound level meter shall be verified and documented prior to and after each monitoring period.

(ii) Manufacturer’s specifications for appropriate meter use shall be followed.

(iii) Noise monitoring shall be supervised by an authorized acoustical engineer.

(iv) All noise measurements shall be made using the A-weighted scale (dB(A)) and a slow response. Fast response measurements may be used to measure impact noise levels.

(v) All compliance noise measurements shall be made at the nearest property line for Residential Properties, unless otherwise indicated under specific provisions of this Variance.

(d) The procedures referenced in this Variance shall be used to determine hourly L_{eq} for any Nighttime Hours construction activity.

(e) All Nighttime Hours construction activity shall be monitored as provided in this Variance. Monitoring shall include spot measurements, as appropriate, and hourly L_{eq} monitoring shall be required for the following activity groups, including:
(i) Excavation or grading work
(ii) Drainage or utility work
(iii) Bridge construction
(iv) Asphalt road surface removal
(v) Asphalt road paving
(vi) Embankment work
(vii) Concrete road paving
(viii) Bridge demolition
(ix) Drilled shafts

(f) In addition to the general procedures for collecting noise data outlined in this Variance, monitoring shall meet the following requirements:

(i) Fixed-location dataloggers for each nighttime activity group shall run during Nighttime Hours.

(ii) Hourly $L_{eq}$ shall be logged for each hour during Nighttime Hours.

(iii) Each activity shall be monitored a minimum of five days for hourly $L_{eq}$ to establish an activity baseline for said activity when initially commenced, and for each activity at the expected worst case situation.

(iv) In locations where the PSB has been installed, no hourly $L_{eq}$ monitoring shall be required except as directed by the IQC Manager. Such monitoring may be necessary where noise levels are within 1 dB(A) of the maximum allowable $L_{eq}$ (when Type I SLM is used) or 2 dB(A) (if a Type 2 SLM is used).

(v) Hourly $L_{eq}$ monitoring shall be re-instituted when any spot check monitoring result shows a short-term noise level at or above the maximum allowable $L_{eq}$ (Type I meter) or 1 dB(A) (type II meter) less than the maximum allowable $L_{eq}$, unless documentation is provided to verify that: (1) an unusual event occurred, and (2) the unusual noise problem has been corrected.

(vi) Documentation of all noise monitoring shall be maintained as described in Section 5(g), below.

(vii) All noise monitoring data and documentation shall be provided to DDPHE upon request, and such data shall be available to the public through DDPHE. DDPHE and its designated representatives may inspect collected data at their discretion.
(g) The following documentation, in a manner and form mutually agreed upon by KIC and DDPHE, shall be provided for all noise monitoring:

(i) Manufacturer names, model numbers, and serial numbers of each SLM and acoustical calibrator used.

(ii) Software manufacturer, program and version.

(iii) Dates of annual certified calibration of SLM, microphone and acoustical calibrator pre- and post-monitoring calibration data for the SLM.

(iv) Date and specific location (by station and address if appropriate) of monitoring.

(v) Start time and end time of monitoring.

(vi) Ambient weather conditions including temperature, relative humidity, wind speed and cloud cover for hourly $L_{eq}$ and spot check monitoring.

(vii) Signature of technician collecting the data.

(viii) List of each hourly $L_{eq}$ for the monitoring period, with associated spot check results.

(ix) Maximum noise level ($L_{max}$) that occurs during hourly $L_{eq}$ monitoring periods and short-term monitoring periods.

(x) Graph of $L_{eq}$ (in dB(A)) vs. time for the monitoring period for hourly, 24-hour, and weekly $L_{eq}$ data.

(xi) Sign-off of all data by authorized acoustic engineer.

(xii) All measurements associated with any unusual noise events that occurred, cause of such event if known, correction of such event if required, and adjusted and unadjusted measurements.

(xiii) Results of all spot checks conducted, including those recording unusual events.

(xiv) Summary of all BMPs in use, including TSBs and their locations.

(h) All data, in hard copy and in an electronic format mutually agreed upon by KIC and DDPHE, must be maintained throughout the life of the Project. Copies of data in the agreed electronic format will be provided to DDPHE upon request.

(i) An annual Project summary report shall be submitted to DDPHE no later than September 1 of each year this Variance is in effect.
6. **Additional Public Participation and Notification Requirements**

(a) In addition to any requirements for public notification and participation imposed above, KIC shall ensure that the following activities occur:

i) ongoing community meetings shall be held to discuss Project noise mitigation practices or compliance issues during the term of this Variance; and

ii) methods such as the Project website shall remain available for people in the community to raise concerns and receive responses.

7. **Revocation.**

Upon notice to KIC from DDPHE, and after a hearing before Denver's Board of Public Health and Environment, the Board may revoke this Variance if KIC fails to comply with its terms.

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APPENDIX B
TO AMENDED PETITION OF KIC FOR VARIANCE ON APPEAL

DEFINITIONS

"A-weighted" means the sound pressure level as measured with a sound level meter using the A-weighting network. The standard notation is dB(A).

"Ambient Background" means the sounds measurable from all sources other than sounds related to Project Work activities [as reflected in the pre-construction analysis of WAVE, dated August 19, 2018 and attached as Appendix D].

"ANSI" means the American National Standards Institute.

"Amended Petition" means the Amended Petition of Kiewit Infrastructure Company for Variance on Appeal pursuant to Part 3, Rules Governing Hearings Before the Denver Board of Public Health & Environment, submitted by Hubert A. Farbes, Jr. to Robert McDonald on August 20, 2018.

"BMPs" means the reasonable best management practices set forth in Section 4(b)(i)-(xviii) of the Variance.

"Board" means the Denver Board of Public Health and Environment.

"CDOT" means Colorado Department of Transportation.

"Central 70 corridor" means the area along Interstate 70 between Interstate 25 and Chambers Road where all Project Work for the Central 70 Project will occur.

"dB(A)" means A-weighted decibels.

"DDPHE" means the Denver Department of Public Health and Environment.

"Decibels" means a logarithmic unit of measure often used in measuring magnitudes of sound. The symbol is dB.

"Denver Noise Abatement Ordinance" means Chapter 36 of the DRMC.

"DRMC" means the Denver Revised Municipal Code.

"Eligibility Zones" means areas (near Major Structures) where Nighttime Hours Noise levels resulting from Major Structure Activity may exceed an L_{eq} of 75 dB(A) or an L_{max} of 86 dB(A) as determined by a sound study conducted by KIC and approved by DDPHE.

"FHA" means Federal Highway Administration.
“General Construction Activity” means all construction activity associated with the Project Work EXCEPT for Major Structure Activity, which is separately regulated. Noise impacts of General Construction Activity for Residential Properties are regulated as prescribed at Section 2 of the Variance.

“Integrating Sound Level Meter” means a device that measures both $L_{eq}$ and $L_{max}$ sound levels.

“KIC” means Kiewit Infrastructure Company.

“$L_{eq}$” means the sound level in decibels equivalent to the total sound energy measure over a stated period of time.

“$L_{max}$” means the maximum sound level during a measurement period or noise event.

“Major Structure” means the structures and locations along the Central 70 corridor where Major Structure Activity may occur, as listed in Appendix E.

“Major Structure Activity” means the Project Work required at Major Structure locations which may create unrestricted Noise exposure to certain Residential Properties. Major Structure Activity is limited and regulated as prescribed in Section 3 of the Variance.

“Nighttime Hours” means the hours of 9:00 p.m. to 7:00 a.m. Monday through Friday, 5:00 p.m. to 8:00 a.m. Saturday and Sunday.

“Noise” means sound that is unwanted and that causes or tends to cause adverse psychological or physiological effects on human beings.

“OSHA” means the Occupational Safety and Health Administration.

“Project” or “Central 70 Project” means the reconstruction and expansion of a portion of Interstate 70 between Interstate 25 and Chambers Road, as prescribed in the design-build contract between KIC and Kiewit Meridiam Partners, Concessionaire to the Colorado Department of Transportation.

“Project Work” means all construction activities related to the reconstruction and expansion of a portion of Interstate 70 between Interstate 25 and Chambers Road.

“PSB” means the project sound barrier installed by KIC for sound mitigation, as described at paragraph 4(a)(i) of the Variance.

“RCNM” means Roadway Construction Noise Model.

“Registered Neighborhood Organization” means those individuals and entities listed in Appendix F to the Amended Petition.

“Residential Properties” means single- and multi-unit dwellings, hotels, motels, nursing homes, fire stations, churches, primary schools, and similar facilities located within or near the Central 70 corridor and potentially affected by Noise from the Project Work.
“Residential Properties Line” means that real or imaginary line and its vertical extension that separates Residential Property owned or controlled by any person from contiguous real property owned or controlled by another person. The vertical and horizontal boundaries of a dwelling unit in a multi-dwelling-unit building, condominium, or townhouse complex shall not be considered Residential Property Lines separating one premises from another.

“Rules” means the Rules Governing Hearings before the Board of Environmental Health (and its successor, the Board of Public Health and Environment), approved March 14, 2014.

“SLM” means sound level meter.

“TSB” means temporary sound barrier, a KIC-developed sound mitigation device which consists of temporary or portable sound-absorbing or sound-insulating materials approved by DDPHE for use at the Project.

“Variance” means the Proposed Grant of Variance Upon Appeal for Construction Work Related to the Central 70 Project, attached as Appendix A to the Amended Petition of Kiewit Infrastructure Company for Variance on Appeal.