



David A Conant, FASA
K Anthony Hoover, FASA, INCE Bd. Cert.

Randal B Willis, P.E.

Taylor L Blaine
Krystofer von Hybschmann

14 March 2023

Tyler Jones, Area Manager
Blount Construction
1353 South Vista Rd
Apache Junction, AZ 85119

Subject: Field Noise Measurement Summary Report
Field Noise Measurements Surrounding Apache Junction Property
1353 S. Vista Road, Apache Junction, AZ
MCH Project 23009

Dear Tyler:

This document summarizes the results of our 08Mar23 visit to Blount Construction in Apache Junction, AZ. The main focus of this visit was the on-site assessment of noise impacts to residential neighbors that would be produced by heavy trucks positioned near the site boundaries which is to include a future 8' tall CMU barrier. Blount Construction expects to expand their current area of activity within those boundaries, notably to the east and north and consequently approach more closely to existing residences. Nearby residents have expressed noise concerns regarding the expansion despite the planned new 8' barrier inside a 30ft easement.

A. BACKGROUND.

In accordance with our proposal, sound level measurements were obtained in order to characterize idling engine noise both within and beyond an existing CMU wall on the property. Because of an explicit exemption within the Apache Junction Noise Ordinance Article 11-1, measurements of backup alarm safety signals were omitted from our proposed tasks.

§ 11-1-8 EXEMPTIONS.

- (A) *General.* The sound levels set forth in this chapter shall not apply to the following noise sources:
- (4) Safety signals, warning devices and emergency pressure relief valves;

This Ordinance also establishes maximum permissible noise for different zoning districts as shown below. In this case, considering the affected residential areas surrounding the business, 60 and 65 dBA correspond to daytime and nighttime limits, respectively.

TABLE 1 SOUND LEVELS FOR LAND USE DISTRICTS

ZONING DISTRICT CLASSIFICATION	LEQ LIMITS, dBA
(Residential) RS-20, RS-20M, RS-10, RS-10M, RS-7, RS-7M, RS-5, RM-1, RM-2, RM-3, MHP, RVP, MPC, RS-GR, RS-54, RS-54M	65 dBA (7:00 a.m. - 10:00 p.m.); 60 dBA (10:00 p.m. - 7:00 a.m.)
(Commercial or Business) B-1, B-2, B-3	65 dBA (7:00 a.m. -10:00 p.m.); 60 dBA (10:00 p.m. - 7:00 a.m.)
(Industrial) B-4, B-5	70 dBA (7:00 a.m. -10:00 p.m.); 65 dBA (10:00 p.m. - 7:00 a.m.)

The LEQ limits specified above in Table 1 are LEQ for a 2-minute time interval. Partial LEQ levels may be obtained as necessary to ensure an accurate indication of the representative sound environment for the site.

(b) Sound projected from property within 1 zoning district into property within another zoning district of a lesser sound level limit shall not exceed such lesser sound level limit.

Instrumentation used for measurements in this study conforms to criteria established in the Ordinance and was a B&K 2250 Type 1 sound level meter/analyzer. The ordinance requires instrumentation meeting Type 2 requirements (see below), which are also met (and actually exceeded) by Type 1 meters. The meter was calibrated prior to measurements and a windscreen was employed to minimize meteorological effects. Weather conditions consisted of clear skies, very light breeze, and a temperature of 70° F (nominal).

§ 11-1-5 SOUND LEVEL MEASUREMENT CRITERIA.

For the purpose of enforcement of the provisions of this chapter, noise levels shall be measured on the A-weighted scale with a sound level meter satisfying at least the applicable requirement for Type 2 sound level meters as defined in American National Standard S1.4-1971 or the most recent revisions thereof. Prior to measurement, the meter shall be set for slow response speed, except that for rapidly varying sound levels, fast response speed may be used. Prior to measurement, the meter shall be calibrated according to the manufacturer's specifications.

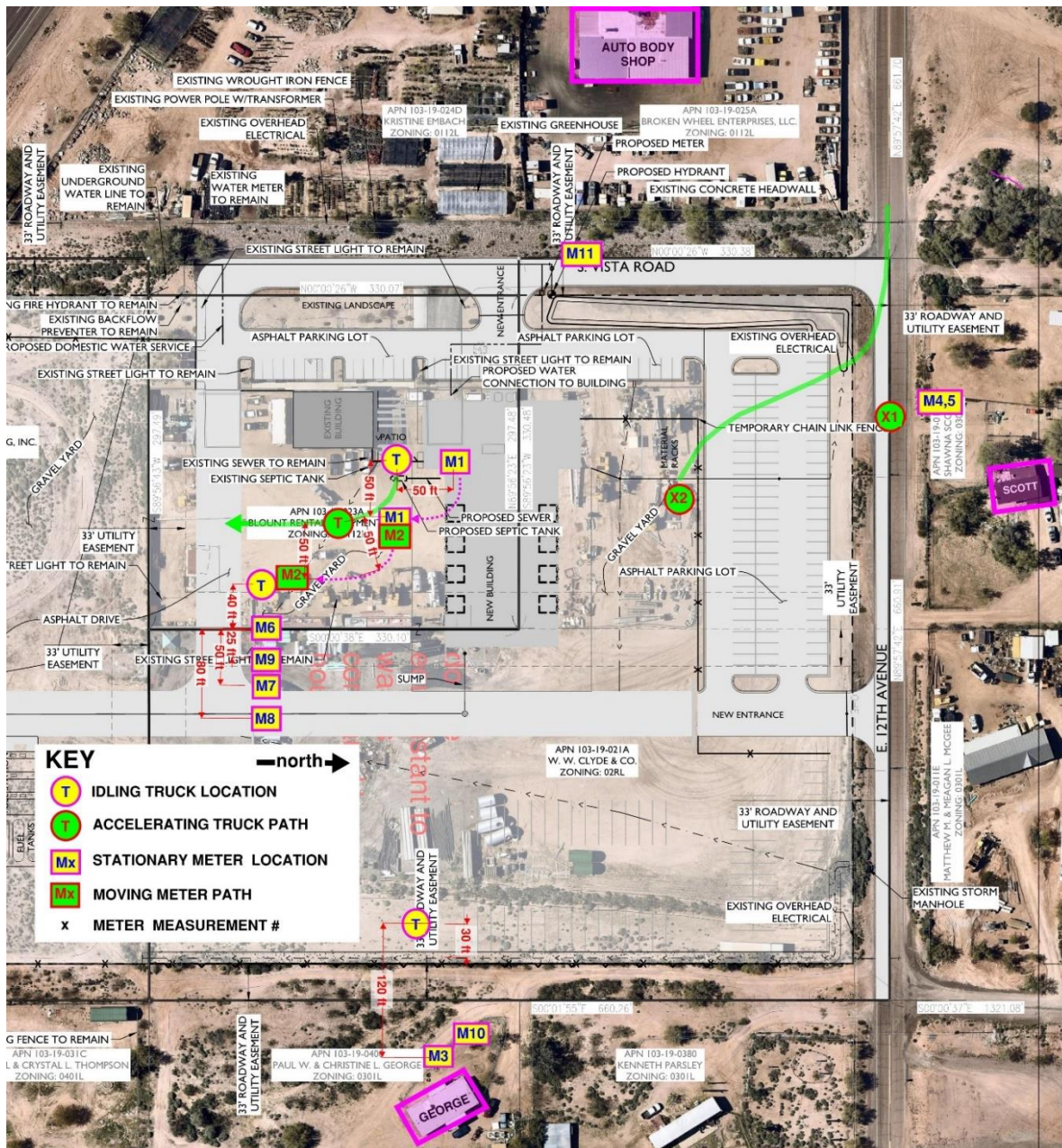
(Ord. 1492, passed 8-18-2020)

All measurements represented typical conditions of on-site ambient noise which included occasional airplanes, dogs barking, light traffic (but notably, some heavy trucks), etc. on East 12th Ave. Standard protocols for environmental noise measurements were followed to ensure appropriate data acquisition. Sound levels pertaining to environmental traffic and commercial noise were also measured for later comparison.

A representative idling heavy truck was used as a reference noise source for sound propagation and barrier insertion loss measurements. We were apprised that the truck used for these measurements was somewhat louder than typical Blount trucks that typically operate (and will operate) on the property. Our measurements and analyses therefore reflect somewhat worst-case scenarios. The photo below depicts this truck at the right-hand side of the Blount office building.



The annotated map below depicts measurement locations during our onsite visit to the property.



Figures 1 and 2 below, depict our measured engine sound pressure levels in an idle as well as active, accelerating state from a 50' spatially averaged distance. There exists a significant increase in sound pressure levels, however, Blount Construction has stated that their trucks remain idle for about 90% of the time when in operation. The positions corresponding to these measurements are identified on the map above by markers M1 and M2.

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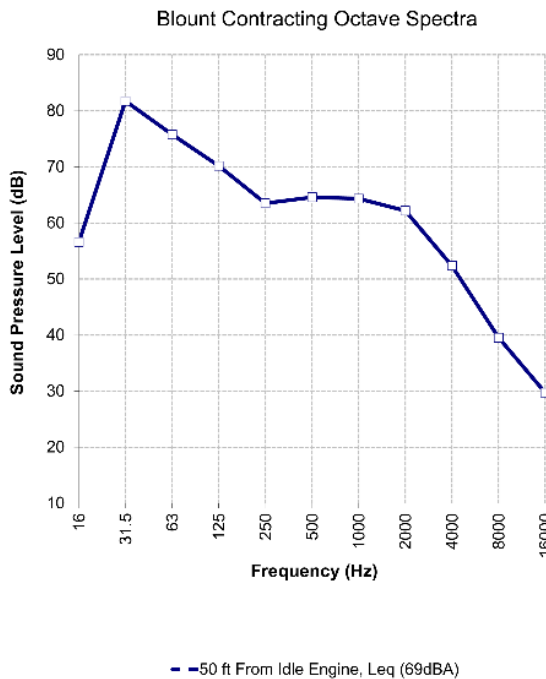


FIGURE 1

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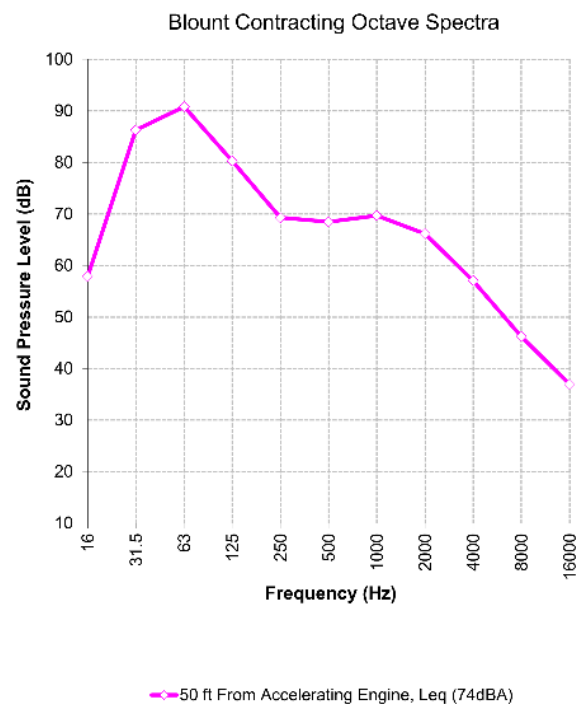
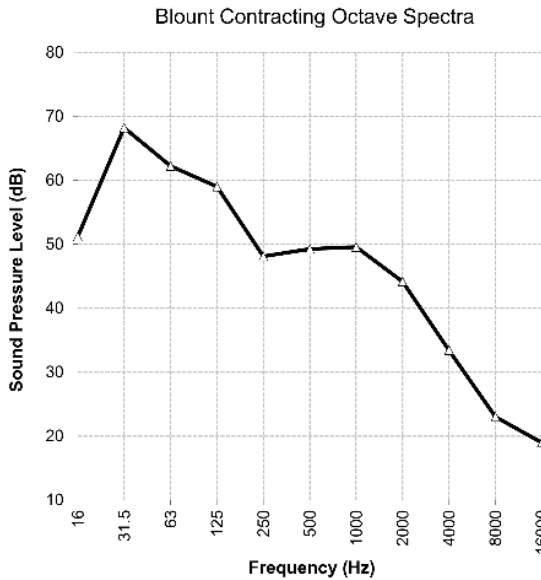


FIGURE 2

To assess idling truck noise impacts close to the George residence as shown on the map above, measurements were collected 120 ft from the reference truck positioned at the future wall's eastern perimeter (Position M3 on map, above). Foliage and elevation irregularities were observed between source and receiver positions although Google Earth indicates both the truck and receiver were effectively at the same elevation. Ambient noise was registered (Position M10) where occasional barking dogs as well as chirping birds remained present sporadically throughout. An increase in measured levels for nearly all frequencies is apparent in Figures 4 and 5, below and the dBA levels rise from 47dBA (ambient) to 53dBA (truck idling). These levels represent truck noise with no barrier and it is noteworthy that the truck noise contribution is 7dB below the Ordinance daytime permitted maximum.

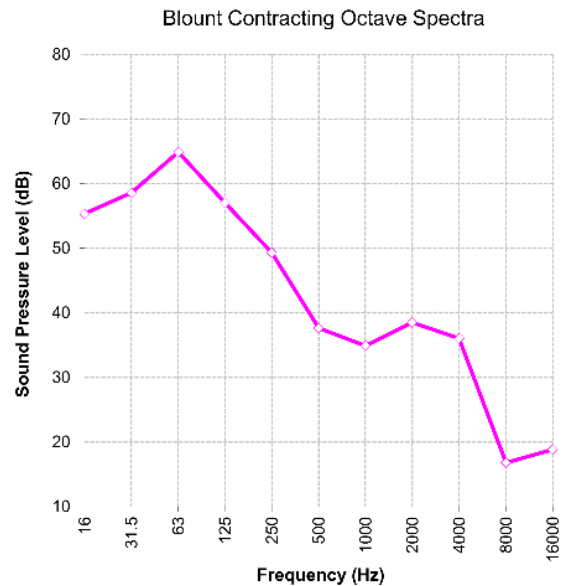
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120 ft From Idle Engine at Christy's, Leq (53dBA)

FIGURE 4

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Ambient Noise at Christy's, Leq (47dBA)

FIGURE 5

Drawing from the measured data, calculations were undertaken to predict noise levels at residence façades with and without the new 8' barrier wall as identified in Figure 6, below. With a 5' distance between the barrier and the truck engine source and an 80' distance separating the barrier and the façade, noise levels at the façade continue to comply with 58 dBA being 2 dB below the daytime limit. This prediction does not include other environmental influences such as intervening topography or foliage.

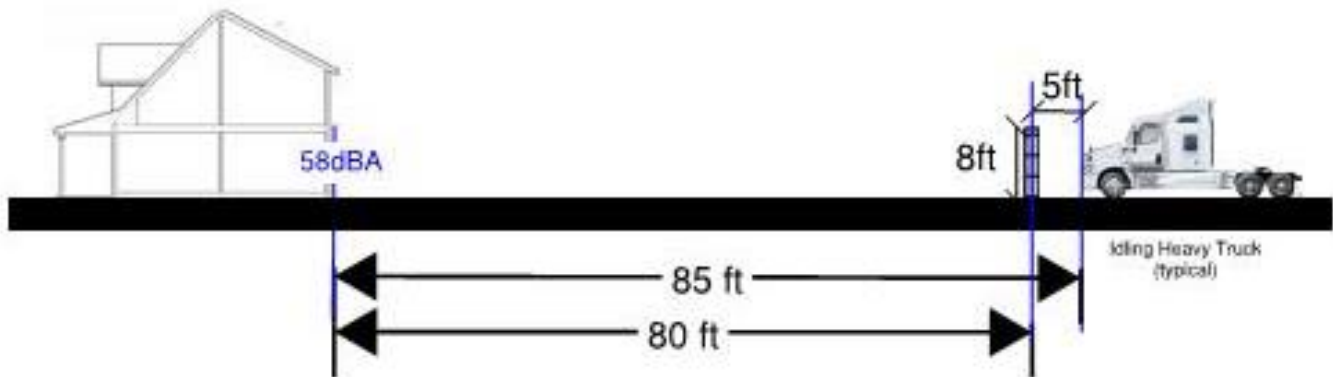


FIGURE 6

Traffic noise was measured in front of the Scott residence on East 12th Ave. in order to chronicle typical levels there. Figures 7 and 8 depict levels collected at the same position, of a pickup truck passing about 6' in front of the meter and a Blount heavy truck approaching at speed, the existing Blount CMU wall (see map X1 and X2), respectively. The average dBA level for the Blount heavy truck complies with the daytime limit at 65 dBA whereas the pickup truck, representative of common traffic noise, exceeds it at 66 dBA.

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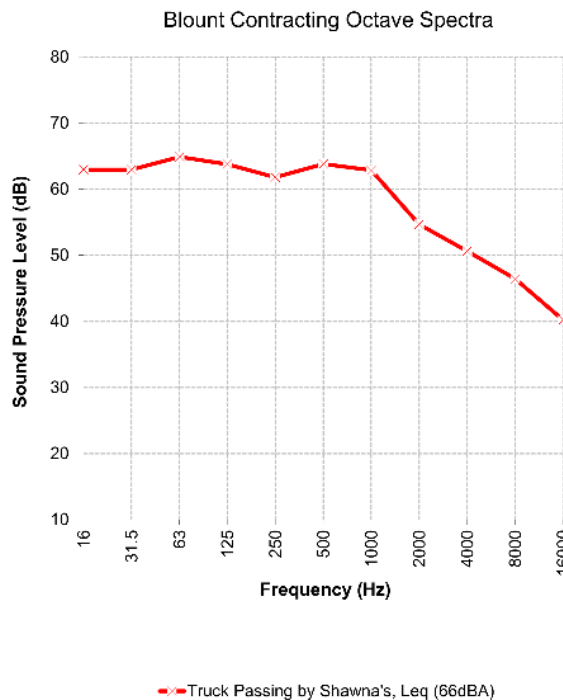


FIGURE 7

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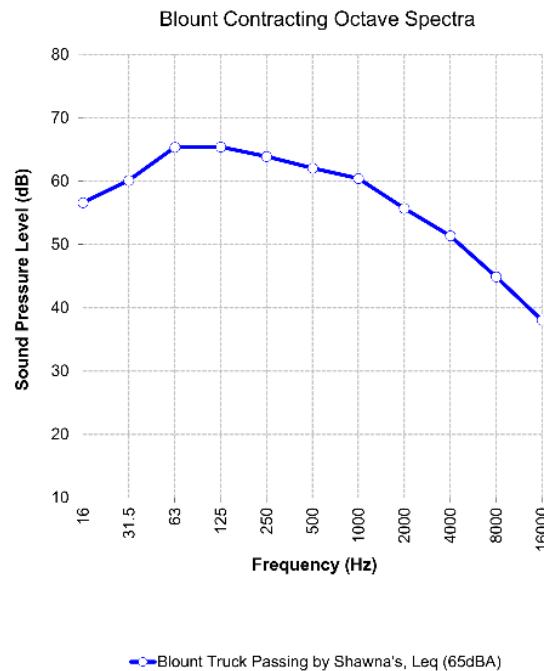
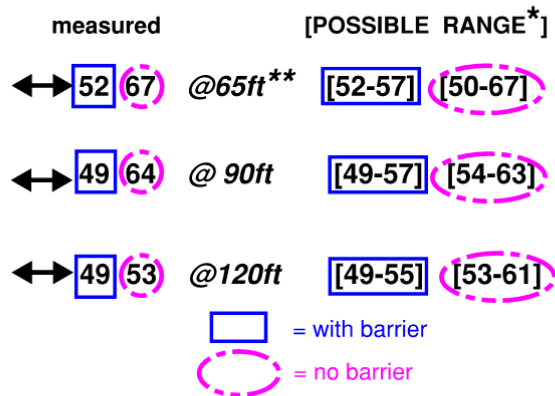


FIGURE 8

As per our proposal, measurements were taken outside the exiting CMU wall at three separate locations. The truck engine was located 40' from the wall and at a height of 8.25', averaging exhaust and engine heights. It should be noted that during these measurements a body shop east of South Vista Rd. commenced operation of a compressor and air, water or paint nozzle that was audible from these positions. In all three cases, the noise ordinance was met as limits were not exceeded. Drawing upon these measured data, predictions were made for barrier effectiveness (insertion loss) considering distances of 65', 90', and 120' from an 8' barrier. These predicted levels (Figure 9) were somewhat higher than those measured due to various surfaces within the premises providing sound scattering as well as the specific orientation of the exhausts and engine radiator. The current barrier includes drainage holes at the bottom of the wall that are worth bearing in mind seeing as they are potential sound leaks yet even with these, the measured results indicate that beyond 20ft from the wall, their presence is apparently negligible.

Noise levels (dBA) from idling heavy truck
 40ft behind prospective 8ft noise barrier at
 shown distances from the truck



* Depends on specific truck and orientation of its radiator & exhaust

** The closer the listener is to the CMU wall drainage holes, the more its attenuation is undermined.

FIGURE 9

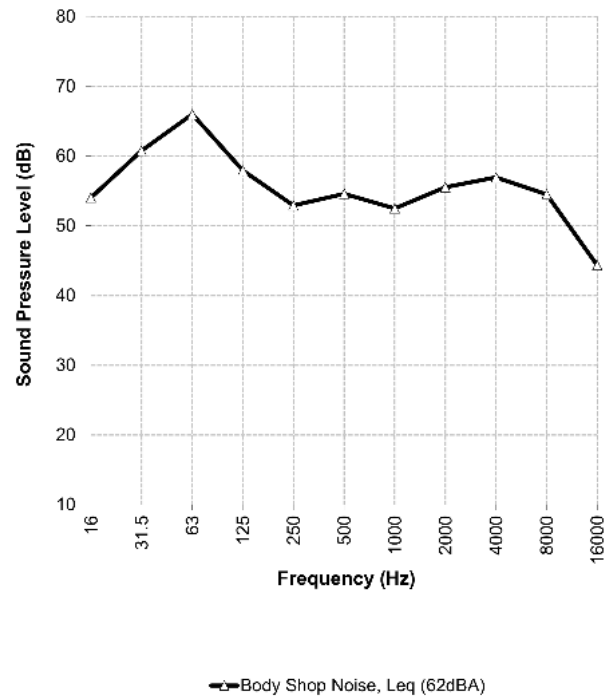


FIGURE 10

Finally, as mentioned above, a body (and or “coating”) shop east of South Vista Rd. was running a compressor at various times during our measurements and its high frequency “hissy” sound was clearly audible. After all essential measurements were taken, we measured the body shop’s noise on South Vista Rd. in front of Blount Construction. Figure 10, above, depicts the sound levels measured at the roadside coming from the shop’s activity (62dBA). This impact doesn’t necessarily represent levels that might be measured at a nearby residential property, but it likely does contribute to residential noise levels in the neighborhood.

In summary, we find that the proposed 8ft tall CMU noise barrier wall, if constructed where currently shown, even with its drainage holes sized as intended, is expected to easily meet, with a significant margin of safety (8dB daytime, 13dB nighttime), the current Apache Junction Noise Ordinance presuming:

1. Typical heavy trucks idling as we measured on 8March20213 on-site.
2. Trucks are positioned with their engines idling at or beyond about 5ft from the wall.
3. Receiver (residence) building are of the order of 80ft from the wall. Note that currently, nearest residence footprints appear to be at least 100ft from the proposed wall.

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This completes our study as proposed, with some variants. Please let us know of any questions or comments.

Sincerely,

McKAY CONANT HOOVER INC

A handwritten signature in black ink, appearing to read "David A. Conant".

David A. Conant, Principal

cc: Matthew Restrepo, Consultant