ZONING CHANGE REVIEW SHEET

CASE: Lake Austin Commons PUD Amendment (C814-82-006.02(83)) DISTRICT: 9

ADDRESS: 1717 West 6th Street and 506 Campbell Street

ZONING FROM: PUD-NP TO: PUD-NP, to change in condition of zoning

SITE AREA: approximately 3.399 acres (approximately 178,060 square feet)

PROPERTY OWNER: 1717 Hartland Plaza LP

AGENT: Armbrust & Brown, PLLC (Richard T. Suttle, Jr.)

CASE MANAGER: Jonathan Tomko (512) 974-1057, jonathan.tomko@austintexas.gov

STAFF RECOMMEDATION:
Staff recommends granting PUD-NP change in condition of zoning to amend the permitted uses, increase maximum height to 90 feet, increase the floor to area ratio (FAR) to 2:1, and include additional environmental requirements.

Amend Permitted Uses
Staff's recommendation allows all uses in the commercial services (CS) zoning district including Condominium Residential, Multi-Family Residential, Townhouse Residential, and Cocktail Lounge (with a maximum square footage limit of 10,000 square feet).

The following 17 uses are prohibited uses in addition to those already prohibited in the CS zoning district:

Alternative Financial Services
Automotive Rentals
Automotive Repair Services
Automotive Sales
Automotive Washing (of any type)
Bail Bond Services
Campground
Drop-Off Recycling Collection Facility
Equipment Repair Services
Equipment Sales
Exterminating Services
Funeral Services
Kennels
Laundry Services
Pawn Shop Services
Service Station
Limited Warehousing and Distribution

Amend Maximum Height
Staff's recommendation amends the maximum building height on the Property is 90-feet, plus additional height limit exceptions in Section 25-2-531 (Height Limit Exceptions).

Increase the Floor to Area Ratio
Staff's recommendation amends the maximum floor-to-area ratio on the Property is 2:1.

Environmental Requirements

Staff's recommendation requires that:
1. New building elements to comply with 2022 AEGB Commercial Guidelines for ST7 Light Pollution Reduction.
2. Proposed new facades above the height of the existing building will achieve an average bird strike threat factor of 30 or less across each new facade as defined by the American Bird Conservancy Bird Threat Material List dated October 2011.
3. The PUD will provide water quality controls in accordance with Chapter 25-8, Subchapter A, Article 6 (Water Quality Controls) of the Land Development Code in effect at the time of site plan submittal.

For a summary of the basis of Staff's recommendation, please see the basis of recommendation section below.

PLANNING COMMISSION ACTION / RECOMMENDATION:
August 13, 2024: Neighborhood Postponement request granted to September 10, 2024.
September 10, 2024: Motion by Commissioner Johnson seconded by Commissioner Woods for applicant request and the agreement read into the record (*Exhibit G*) pending legal review on the consent agenda (9-0).

CITY COUNCIL ACTION:
November 7, 2024: Postponed to November 21, 2024 at the request of staff.
November 21, 2024: Case is scheduled to be heard by City Council.

ORDINANCE NUMBER:
N/A

ISSUES: The subject tract had been operating eight outdoor rooftop pickleball courts since approximately October 2023, on the above ground parking structure. The outdoor sports and recreation use was not an allowed under the approved Planned Unit Development and adopted ordinance. Neighbors have reported filing several code enforcement requests and have been in discussions to mitigate both sound and light pollution. This request seeks several changes detailed in the *Case Manager Comments* section below and the applicant's summary letter (*exhibit B*) including coming into compliance with an outdoor sports and recreation use.

CASE MANAGER COMMENTS:
The applicant is proposing: to amend the permitted uses, increase maximum height to 90 feet, increase the floor to area ratio (FAR) to 2:1, and agree to additional environmental requirements.

While the PUD ordinance encompasses approximately 5.96 acres, this application only encompasses the approximately 3.399 north of West 5th Street.

The subject tract is currently developed with a four-story office building with street level retail, below grade parking and a second parking structure with ground level retail uses and eight rooftop pickleball courts. To the north, is the University of Texas Gateway Apartments and seven single/multifamily homes that are being utilized for professional offices. To the east, are several multifamily structures that are currently being used as professional offices or small retail storefronts and paved surface parking. To the south, is an eight story JLL Plaza office building that contains a bank and three stories of structure parking (this structure is also part of this PUD, but is not included in this request). Approximately 116,000 square feet of office is within this structure. A sliver of undeveloped LI-NP zoned land between the railroad tracks

and the Mopac Northbound onramp. To the west, approximately ¼ mile across the Mopac interchange are several single-family homes in the Deep Eddy Neighborhood.

Staff noted that there are two older ground-level tennis courts within UT's Gateway Apartments property that have existed for what seems to be a long time (based on their condition) much closer to single family zoned parcels.

BASIS OF RECOMMENDATION:

Zoning should allow for reasonable use of the property.

The subject tract is $^{2}/_{3}$ mile west of the Central Business District and there have been several recent rezoning cases along West 5th and West 6th Streets (both Imagine Austin Activity Corridors) that have expanded permitted uses, increased maximum building heights, and floor to area ratios, on tracts proximate to Downtown Austin. This has occurred since the last modification of this PUD and is deemed reasonable given the location, the additional environmental requirements the applicant has agreed to, and the growing needs of the City to be more compact and connected.

The proposed zoning should be consistent with the goals and objectives of the City Council.

The additional uses, increased maximum building height, and floor to area ratio, adjacent to two Imagine Austin Activity Corridors with frequent transit service (CapMetro Route 4) promotes Imagine Austin's goal to "allow people to reside, work, shop, access services, people watch, recreate, and hang out without traveling far distances."

Zoning should promote a transition between adjacent and nearby zoning districts, land uses, and development intensities.

The subject tract is not adjacent to any single-family zoning. A narrow strip of NO and LO base district zoning exists to the north of the subject tract creating a transition of approximately 250 feet between the PUD and single-family zoning to the north.

EXISTING ZONING AND LAND USES:

	ZONING	LAND USES
Site	PUD-NP	A four-story office building with street level retail, below grade parking and a second parking structure with ground level retail uses and eight rooftop pickleball courts.
North	UNZ (unzoned), NO-NP, NO-MU-CO-NP, and LO-NP	The University of Texas Gateway Apartments and seven single/multifamily homes that are being utilized for professional offices.
South	PUD-NP and LI-NP	An eight story JLL Plaza office building that contains a bank and three stories of structure parking (this structure is also part of this PUD but is not included in this request – see the *case manager comments* section above for more information). Approximately

		116,000 square feet of office is within this structure. A sliver of undeveloped LI-NP zoned land between the railroad tracks and the Mopac Northbound onramp.
East	CS-MU-V-CO-NP, CS-MU-CO-NP, and GO-NP	Several multifamily structures that are currently being used as professional offices or small retail storefronts and paved surface parking.
West (1/4 mile away across Mopac Interchange)	SF-3-NP	Several single-family homes in the Deep Eddy Neighborhood

NEIGHBORHOOD PLANNING AREA: Old West Austin Neighborhood Planning Area

WATERSHED: Lady Bird Lake Watershed and Johnson Creek Watershed

SCHOOLS: A.I.S.D.
Matthews Elementary School
O Henry Middle School
Austin High School

COMMUNITY REGISTRY LIST:
Austin Independent School District, Austin Lost and Found Pets, Austin Neighborhoods Council, Friends of Austin Neighborhoods, Homeless Neighborhood Association, Neighborhood Empowerment Foundation, Old West Austin Neighborhood Association, Old West Austin Neighborhood Plan Contact Team, Preservation Austin, SELTexas, Save Barton Creek Assn., Save Historic Muny District, Shoal Creek Conservancy, Sierra Club, Austin Regional Group

AREA CASE HISTORIES:

Number	Request	Commission	City Council
C14-2018-0150 (1804/1806/1808 West 6th Street Rezoning)	The Applicant is proposing to rezone adjacent properties at 1804, 1806 and 1808 W 6th St. (0.681 acres) from SF-3-NP to LO-MU-NP.	05.14.2019: Motion by Commissioner Shaw, seconded by Commissioner Seeger to grant Staff's recommendation of NO-MU-NP was approved on a vote 10-1. Commissioner McGraw voted nay. Chair Kazi and Commissioner Shieh off the dais.	09.19.2019: MF-4-NP for 1804 West 6th Street and MF-4-CO-NP for 1806 and 1808 West 6th Street was approved with conditions on Council Member Kitchen's motion, Council Member Ellis' second on an 11-0 vote.

C14-2023-0023 (West 5th Street Bank)	The Applicant is proposing to rezone approximately 0.499 acres from LO-V-CO-NP to CS-MU-V-CO-NP.	07.11.2023: Approved staff's recommendation for CS-MU-V-CO-NP by consent (12-0); J. Connolly-1st, C. Hempel-2nd	09.01.2023: CS-MU-V-CO-NP was approved on Council Member Pool's motion, Council Member Qadri's second on a 9-0 vote. Council Members Harper-Madison and Vela were off the dais.

RELATED CASES:
C814-82-006: Original PUD case (Approved 11.04.1982)
C814-82-006.01(83): PUD Amendment to allow a change in permitted uses. (Approved 07.27.2006)

ADDITIONAL STAFF COMMENTS:
Comprehensive Planning
Project Name and Proposed Use: 1717 W 6TH STREET. C814-82-006.02(83). Project: Lake Austin Commons PUD Amendment. Old West Austin NP. FLUM: N/A. The applicant is proposing to amend a previously approved PUD for 3.399 acres of the 5.96 acre PUD. Existing: 155,584 sq ft office building with below grade and secondary above ground parking structure with eight rooftop pickleball courts, 11,567 sq ft retail uses, 5,341 sq ft medical office, 4,879 sq ft financial services, and 6,000 sq ft restaurant. Proposed: maintain existing uses and square footages, but increase office space to 183,384 sq ft above parking garage. Proposes to amend the PUD Ordinance and land use plan to allow additional permitted uses, increase maximum height to 90 ft and FAR to 2:1 to increase parking structure floor space, to request exemption from Section 25-2-1063 of Austin City Code regarding Height Limitations and Setbacks for Large Sites, and to modify Section 25-6-471 regarding Off-Required for a minimum of 530 parking spaces on-site.

Yes	Imagine Austin Decision Guidelines
	Complete Community Measures *
Y	**Imagine Austin Growth Concept Map:** Located within or adjacent to an Imagine Austin Activity Center, Imagine Austin Activity Corridor, or Imagine Austin Job Center as identified the Growth Concept Map. **Names of Activity Centers/Activity Corridors/Job Centers *:** • **5th/6th Streets/Lake Austin Boulevard Activity Corridor**
Y	**Mobility and Public Transit ***: Located within 0.25 miles of public transit stop and/or light rail station. • **Adjacent to W 6th St Bus Stop**
Y	**Mobility and Bike/Ped Access *:** Adjoins a public sidewalk, shared path, and/or bike lane. • **Sidewalks present on W 6th St, Campbell St, and W 5th St**
Y	**Connectivity, Good and Services, Employment ***: Provides or is located within 0.50 miles to goods and services, and/or employment center.
	Connectivity and Food Access *: Provides or is located within 0.50 miles of a grocery store/farmers market.

Y	**Connectivity and Education ***: Located within 0.50 miles from a public school or university. • **Matthews Elementary School**
Y	**Connectivity and Healthy Living ***: Provides or is located within 0.50 miles from a recreation area, park or walking trail. • **Sidewalk infrastructure intersecting MoPac provides access to Deep Eddy Neighborhood Park**
Y	**Connectivity and Health ***: Provides or is located within 0.50 miles of health facility (ex: hospital, urgent care, doctor's office, drugstore clinic, and/or specialized outpatient care.) • **Freeman Medical Clinic**
	Housing Choice *: Expands the number of units and housing choice that suits a variety of household sizes, incomes, and lifestyle needs of a diverse population (ex: apartments, triplex, granny flat, live/work units, cottage homes, and townhomes) in support of Imagine Austin and the Strategic Housing Blueprint.
	Housing Affordability *: Provides a minimum of 10% of units for workforce housing (80% MFI or less) and/or fee in lieu for affordable housing.
	Mixed use *: Provides a mix of residential and non-industrial uses.
	Culture and Creative Economy *: Provides or is located within 0.50 miles of a cultural resource (ex: library, theater, museum, cultural center).
	Culture and Historic Preservation: Preserves or enhances a historically and/or culturally significant site.
	Creative Economy: Expands Austin's creative economy (ex: live music venue, art studio, film, digital, theater.)
Y	**Workforce Development, the Economy and Education**: Expands the economic base by creating permanent jobs, especially in industries that are currently not represented in a particular area or that promotes a new technology, and/or promotes educational opportunities and workforce development training.
	Industrial Land: Preserves or enhances industrial land.
	Not located over Edwards Aquifer Contributing Zone or Edwards Aquifer Recharge Zone
8	**Number of "Yes's"**

Drainage

DE1. Upon review of the application and supporting documentation, it appears there are no proposed changes to the PUD that are associated with drainage engineering requirements. No drainage comments at this time.

Environmental

EO1 U0 To offset the impact of light pollution from the increase in height, incorporate light pollution reduction criteria into the development by committing to compliance with Austin Energy Green Building ST7 Light Pollution Reduction standards or alternative standards for reducing light pollution.

EO2 U0 To offset the impact on bird collision from the increase in height, incorporate bird friendly design criteria into the development by committing to compliance with Austin Energy Green Building STEL5 Bird Collision Deterrence standards or alternative standards for reducing bird collision.

EO3 U0 Remove grandfathering language from the ordinance.

Fire
No comments on rezoning.

PARD – Planning & Design Review
PR1: PUD amendment as proposed does not trigger additional superiority requirements for parkland dedication.

Site Plan
SP1. Site plans will be required for any new development other than single-family or duplex residential.

SP2. Any development which occurs in an SF-6 or less restrictive zoning district which is located 540-feet or less from property in an SF-5 or more restrictive zoning district will be subject to compatibility development regulations.

SP3. Any new development is subject to Subchapter E. Design Standards and Mixed Use. Additional comments will be made when the site plan is submitted.

SP4. A portion of the proposed zoning area is located within the Scenic Roadways Overlay.

SP5. This tract is already developed, and the proposed zoning change is a footprint within the existing development.

Transportation and Public Works Department (TPW) – Engineering Review

TPW 1. In consideration of the City's updated parking regulations, the Transportation Public Works Department **does not recommend approval of the proposed PUD amendment** which would require a minimum of 530 parking spaces.

U1: *Comment cleared.*

TPW 2. If the parking requirement amendment is to be recommended, TPW requests that the site be subject to the submittal and approval of a Transportation Demand Management Plan in accordance with Transportation Criteria Manual guidelines.

U1: *Comment cleared.*

TPW 3. Additional right-of-way maybe required at the time of subdivision and/or site plan according to the Transportation Plan [LDC 25-6-51 and 25-6-55].

U1: *Comment cleared.*

TPW 4. A traffic impact analysis shall be required at the time of site plan if triggered, when land uses and intensities will be known per LDC 25-6-113 and TCM 10.2.1.

U1: *Comment cleared.*

EXISTING STREET CHARACTERISTICS:

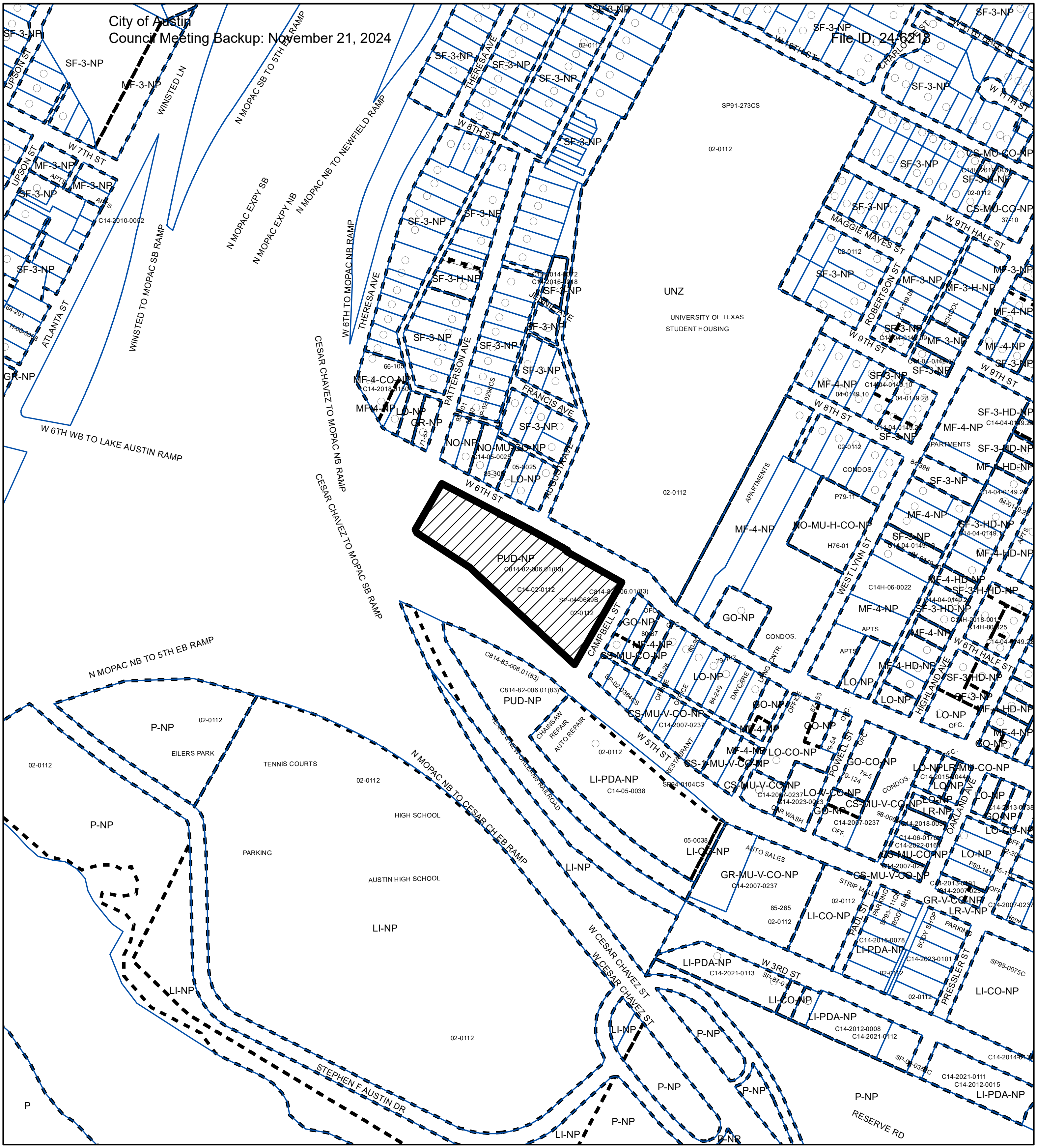
Name	ASMP Classification	ASMP Required ROW	Existing ROW	Existing Pavement	Sidewalks	Bicycle Route	Capital Metro (within ¼ mile)
W. 5th Street	3	80’	83’-212’	50’	Yes	Yes	Yes
W. 6th Street	3	80’	63’	40’	Yes	Yes	Yes
Campbell Street	1	58’	60’	42’	Yes	No	Yes

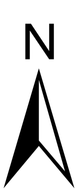
TIA: A traffic impact analysis has been waived as the site must demonstrate compliance with the TIA associated with Lake Austin Commons PUD. TIA may require update upon further review.

Austin Water Utility
Comments cleared.

Water Quality
WQ 1. Please make sure all the new imperious cover and the re-development will meet the current Water Quality Criteria.

INDEX OF EXHIBITS AND ATTACHMENTS TO FOLLOW:
A. Zoning Map
B. Applicant’s Summary Letter Dated February 19, 2024, and Applicant Comment Response Letter Dated June 13, 2024.
C. Correspondence from Interested Parties
D. Draft Redlined Ordinance (Most Recent Revision incorporating AWU comments)
E. Austin Pickle Ranch Sound Monitoring Report 3.29.24 (BAI)
F. Light Study
G. Agreement between Applicant and Neighborhood read into the record at Planning Commission on 9/24/24 before Planning Commission motion for approval.





SUBJECT TRACT

PENDING CASE

ZONING BOUNDARY

1 " = 400 '

PLANNED UNIT DEVELOPMENT

ZONING CASE#: C814-82-006.02(83)

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

This product has been produced by the Planning Department for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness.

ARMBRUST & BROWN, PLLC

ATTORNEYS AND COUNSELORS

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February 19, 2024

Lauren Middleton-Pratt
Planning Director
City of Austin
1000 E. 11th Street, Suite 200
Austin, Texas 78702

Re: PUD Amendment Application for Lake Austin Commons PUD (C814-82-006.01(83)) (the "Application")

Dear Mrs. Middleton-Pratt:

This Application is submitted to amend Ordinance No. 821104-F, as amended under Ordinances No. 840607-F, 900628-B, 920528-J, and 20060727-122 (the "PUD Ordinance"), for property located at 1717 W. 6th Street and legally described as Lot 1, Lake Austin Commons, according to the plat of record in Volume 83, Page 58c of the Plat Records of Travis County, Texas (the "Property"). The PUD Ordinance covers approximately ±5.96 acres of land, of which, only ±3.399 acres are included in this Application.

The Property is part of the Hartland Plaza development just east of Mopac and is located in the Old West Austin Neighborhood Planning Area. The Property is currently developed with a four (4) story office building with below grade parking and a second parking structure with ground level retail uses and eight (8) rooftop pickleball courts.

A site plan is attached to the PUD Ordinance and constitutes the Part "A" land use site plan for the Property. Multiple revisions and corrections to the Part "A" land use site plan have been submitted and approved since the PUD was originally approved in 1982. The Part "B" construction element of the site plan for the parking structure was submitted and approved under City Case No. SP-2004-0689B. A summary of the chronology of the zoning and permitting history on the Property is provided in Exhibit "A".

The purpose of this request is to amend the PUD Ordinance and land use site plan to allow for additional permitted uses, increase the maximum height and floor-to-area ratio (FAR) of the Property to 90-ft and 1.6:1 to allow an additional floor to be added to the existing parking structure, and update the parking requirements to require a minimum of 530 parking spaces on the Property. In addition, following the Judicial Courts decision to repeal the Corridor Ordinance approved by

Ordinance 20221201-056, a code modification is also requested with this Application to exempt the Property from Section 25-2-1063 (*Height Limitations and Setbacks for Large Sites)* of the City of Austin Land Development Code to accommodate the additional height proposed with the amendment. A site plan revision to the Part "B" site plan will be submitted in the future with more detail regarding the building and construction elements.

Enclosed with this Application is a copy of the redlined zoning ordinance as well as the redlined Part "A" land use plan which show the requested changes. Thank you for your time and consideration of this matter. If you have any questions, comments, or need additional information, please do not hesitate to contact me at (512) 435-2300 or Amanda Hendrix at (512) 435-2328.

Very truly yours,

ARMBRUST & BROWN, PLLC

Richard T. Suttle, Jr.

cc: Joi Harden
Amanda Hendrix

Exhibit "A" – Zoning and Permitting History

November 4, 1982	Ordinance 821104-F approved rezoning the property to a PUD and requiring development of the property comply with the land use site plan.
January 12, 1983	Lake Austin Commons subdivision recorded in Vol. 83, Page 58C of the Plat Records of Travis County, Texas. City Case No. C814-82-006.1
June 7, 1984	Ordinance 840607-F approved granting approval of Revision to the Site Plan
May 4, 1990	Site Plan for Austin Commons PUD, Lake Austin Financial Plaza Interim Parking submitted under Case No. SP-92-0088B.
June 28, 1990	Ordinance 900628-B approved granting approval of a revision to the site plan.
May 28, 1992	Ordinance 920528-J approved granting approval of an amendment to the site plan.
August 14, 1992	Site Plan for Lake Austin Commons Parking Expansion approved under Case No. SP-92-0116B.
March 29, 2005	Site Plan for Lake Austin Commons Phase 3-A Parking Garage approved under Case No. SP-04-0689B.
July 27, 2006	Ordinance 20060727-122 approved amending the site plan and adding additional permitted uses on the first floor of the Phase 3-A parking garage.

ARMBRUST & BROWN, PLLC

ATTORNEYS AND COUNSELORS

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Amanda Hendrix
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ahendrix@abaustin.com

June 13, 2024

Jonathan Tomko, Case Manager
City of Austin Planning Department
1000 E. 11th Street, Suite 200
Austin, Texas 78702

Re: Lake Austin Commons PUD Amendment – Response to City Comments (Master Review Report) for C814-82-006.02(83)

Dear Mr. Tomko:

Please see below responses to staff comments as noted in the Master Review Report dated April 2, 2024 for the Lake Austin Commons PUD Amendment application.

Environmental Office – Leslie Lilly – leslie.lilly@austintexas.gov

EO1 U0: To offset the impact of light pollution from the increase in height, incorporate light pollution reduction criteria into the development by committing to compliance with Austin Energy Green Building ST7 Light Pollution Reduction standards or alternative standards for reducing light pollution.

Response: A meeting with the reviewer was held on May 2, 2024. The applicant and the reviewer have agreed upon the following language to achieve the intent of AEGB ST7 Light Pollution Reduction: "New building elements to comply with 2022 AEGB Commercial Guidelines for ST7 Light Pollution Reduction."

The proposed language has been added to the redlined ordinance submitted with this update.

EO2 U0: To offset the impact on bird collision from the increase in height, incorporate bird friendly design criteria into the development by committing to compliance with Austin Energy Green Building STEL5 Bird Collision Deterrence standards or alternative standards for reducing bird collision.

Response: A meeting with the reviewer was held on May 2, 2024. The applicant and the reviewer have agreed upon the following language to achieve the intent of AEGB STEL5 Bird Collision Deterrence standards: "Proposed new facades above the height of the existing building will achieve an average bird strike threat factor of 30 or less across each new façade

as defined by the American Bird Conservancy Bird Threat Material List dated October, 2011."

The proposed language has been added to the redlined ordinance submitted with this update.

EO3 U0: Remove grandfathering language from the ordinance.

Response: The following language has been added to the redlined ordinance:

"The PUD will provide water quality controls in accordance with Chapter 25-8, Subchapter A, Article 6 (Water Quality Controls) of the Land Development Code in effect at the time of site plan submittal.

Except for water quality and as otherwise specifically provided by this ordinance, all other rules, regulations, and ordinances of the City in effect on July 27, 2006 apply to the PUD. However if the existing parking garage and office building on the property are removed and the site is redeveloped the new development shall comply with current code in effect at the time an application for development is submitted."

NPZ Drainage Engineering Review – Drainage Construction Review – yanjun.chu@austintexas.gov

> RELEASE OF THIS APPLICATION DOES NOT CONSTITUTE A VERIFICATION OF ALL DATA, INFORMATION, AND CALCULATION SUPPLIED BY THE APPLICANT. THE ENGINEER OF RECORD IS SOLELY RESPONSIBLE FOR THE COMPLETENESS, ACCURACY, AND ADEQUACY OF HIS/HER SUBMITTAL, WHETHER OR NOT THE APPLICATION IS REVIEWED FOR CODE COMPLIANCE BY CITY ENGINEERS.
>
> **The review was performed by an external, former DSD Drainage and Water Quality reviewer. Please note that the external reviewer is not authorized to present or communicate on behalf of the DSD DE/WQ group. Do not directly contact the external reviewers. Any questions or inquiries regarding this plan must be directed to the DSD's designated point of contact (please see the email at the top of this document).**

DE1: Upon review of the application and supporting documentation, it appears there are no proposed changes to the PUD that are associated with drainage engineering requirements. Please confirm this is correct. No drainage comments at this time.

Response: The PUD amendment does not propose any changes to the drainage requirements.

NPZ Water Quality Review – Drainage Construction Review – yanjun.chu@austintexas.gov

Release of this application does not constitute a verification of all data, information, and calculation supplied by the applicant. The engineer of record is solely responsible for the

completeness, accuracy, and adequacy of his/her submittal, whether or not the application is reviewed for code compliance by city engineers.

The review was performed by an external, former DSD Drainage and Water Quality reviewer. Please note that the external reviewer is not authorized to present or communicate on behalf of the DSD DE/WQ group. Do not directly contact the external reviewers. Any questions or inquiries regarding this plan must be directed to the DSD's designated point of contact (please see the email at the top of this document).

WQ1: Upon review of the application and supporting documentation, it appears there are no proposed changes to the PUD that are associated with water quality requirements. Please confirm this is correct. No water quality comments at this time.

Response: The PUD amendment does not propose any changes to the water quality requirements.

NPZ Austin Water Utility Review – Virginia Collier – 512-974-0117

Monday March 18, 2024

Any new or redevelopment project within the boundaries of this PUD shall comply with Land Development Code Section 25-9 Article 5 (Additional Water Conservation Measures).

Response: The PUD will comply with Land Development Code, Section 25-9 Article 5 (*Additional Water Conservation Measures)* if the existing parking garage and office building on the property are removed and the site is substantially redeveloped. The following language has been added to the redlined ordinance:

"Except for water quality and as otherwise specifically provided by this ordinance, all other rules, regulations, and ordinances of the City in effect on July 27, 2006 apply to the PUD. However if the existing parking garage and office building on the property are removed and the site is substantially redeveloped the new development shall comply with current code in effect at the time an application for development is submitted."

ATD Engineering Review – Bryan Golden – 512-974-2426

TPW 1. In consideration of the City's updated parking regulation, the Transportation Public Works Department **does not recommend approval of the proposed PUD amendment** which would require a minimum of 530 parking spaces.

Response: The request for a minimum parking requirement has been removed and the redlined ordinance and plan sheets have been updated accordingly.

TPW 2. If the parking requirement amendment is to be recommended, TPW requests that the site by subject to the submittal and approval of a Transportation Demand Management Plan in accordance with Transportation Criteria Manual guidelines.

Response: Comment noted. The request for a minimum parking requirement has been removed and the redlined ordinance and plan sheets have been updated accordingly.

TPW 3. Additional right-of-way maybe required at the time of subdivision and/or site plan according to the Transportation Plan [LDC 25-6-51 and 25-6-55].

Response: Comment noted.

TPW 4. A traffic impact analysis shall be required at the time of site plan if triggered. When land uses and intensities will be known per LDC 25-6-113 and TCM 10.2.1.

Street Classification Table:

Name	ASMP Classification	ASMP Required ROW	Existing ROW	Existing Pavement	Sidewalks	Bicycle Route	Capital Metro (within ¼ mile)
W. 5th Street	3	80'	83'-212'	50'	Yes	Yes	Yes
W. 6th Street	3	80'	63'	40'	Yes	Yes	Yes
Campbell Street	1	58'	60'	42'	Yes	No	Yes

Response: Comment noted.

Sincerely,

ARMBRUST & BROWN, PLLC

Amanda Hendrix

cc: Joi Harden
Jay Lamy
Andrew Reue
Richard T. Suttle, Jr.

PUBLIC HEARING INFORMATION

This zoning/rezoning request will be reviewed and acted upon at two public hearings: before the Land Use Commission and the City Council. Although applicants and/or their agent(s) are expected to participate in a public hearing, you are not required to participate. This meeting will be conducted both online and in-person at which you will have the opportunity to speak FOR or AGAINST the proposed development or change. Contact the case manager for further information on how to participate in the public hearings. You may also contact a neighborhood or environmental organization that has expressed an interest in an application affecting your neighborhood.

Staff is conducting a pilot program to receive case-related comments online which can be accessed through this link or QR code: https://bit.ly/ATXZoningComment.

During its public hearing, the board or commission may postpone or continue an application's hearing to a later date or may evaluate the City staff's recommendation and public input forwarding its own recommendation to the City Council. If the board or commission announces a specific date and time for a postponement or continuation that is not later than 60 days from the announcement, no further notice is required.

During its public hearing, the City Council may grant or deny a zoning request or rezone the land to a less intensive zoning than requested but in no case will it grant a more intensive zoning.

However, in order to allow for mixed use development, the Council may add the MIXED USE (MU) COMBINING DISTRICT to certain commercial districts. The MU Combining District simply allows residential uses in addition to those uses already allowed in the seven commercial zoning districts. As a result, the MU Combining District allows the combination of office, retail, commercial, and residential uses within a single development.

For additional information on the City of Austin's land development process, visit our website: www.austintexas.gov/planning.

Written comments must be submitted to the board or commission (or the contact person listed on the notice) before the public hearing. Your comments should include the board or commission's name, the scheduled date of the public hearing, and the Case Number and the contact person listed on the notice. Correspondence and information submitted to the City of Austin are subject to the Texas Public Information Act (Chapter 552) and will be published online.

Case Number: C814-82-006.02(83)
Contact: Jonathan Tomko, 512-974-1057
Public Hearing: August 13, 2024, Planning Commission

Richard Patrick
Your Name (please print)

☐ **I am in favor**
☑ **I object**

1702 Francis Ave
Your address(es) affected by this application

Rick Patrick — August 7, 2024
Signature — *Date*

Daytime Telephone: 512-577-9092

Comments: The applicant has not met the neighborhood's requirements for eliminating the nuisance factors of the Pickle Ranch and this application is unclear as to their proposed uses for the expansion

If you use this form to comment, it may be returned to:
City of Austin - Planning Department
Jonathan Tomko
P. O. Box 1088, Austin, TX 78767-8810

Or email to:
jonathan.tomko@austintexas.gov

202XXXXX-XX

ORDINANCE NO. ~~20060727-122~~

AN ORDINANCE AMENDING ORDINANCE NO. 821104-F TO MODIFY THE LAND USE PLAN, TO REZONE AND CHANGE THE ZONING MAP FROM PLANNED UNIT DEVELOPMENT-NEIGHBORHOOD PLAN (PUD-NP) COMBINING DISTRICT TO PLANNED UNIT DEVELOPMENT-NEIGHBORHOOD PLAN (PUD-NP) COMBINING DISTRICT FOR LAND KNOWN AS THE LAKE AUSTIN COMMONS PLANNED UNIT DEVELOPMENT AKA HARTLAND PLAZA LOCATED IN THE OLD WEST AUSTIN NEIGHBORHOOD PLAN AREA AT 1717 WEST 6TH STREET AND 1711 WEST 5TH STREET.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

PART 1. Lake Austin Commons planned unit development ("Lake Austin Commons PUD") is comprised of approximately 4.326 acres of land located at 1717 West 6th Street and 1711 West 5th Street, and more particularly described in Ordinance No. 821104-F.

PART 2. Lake Austin Commons PUD was approved November 4, 1982, under Ordinance No. 821104-F (the "Original PUD Ordinance"), and amended under Ordinances No. 840607-F, No. 900628-B, and No. 920528-J, and No. 20060727-122,

PART 3. The zoning map established by Section 25-2-191 of the City Code is amended to change the base district from planned unit development-neighborhood plan (PUD-NP) combining district to planned unit development-neighborhood plan (PUD-NP) combining district on the property described in the Original PUD Ordinance, and as follows:

> Lot 1 Lake Austin Commons Subdivision a subdivision in the City of Austin, according to the map or plat of record in Plat Book 83, Page 58c, of the Plat Records of Travis County, Texas, ~~and Lot 1, Block A, Lake Austin Commons II Subdivision, a subdivision in the City of Austin, of record in Document No. 200600208, in the Official Public Records of Travis County, Texas~~ (the "Property"),

locally known as the property located at 1717 West 6th Street ~~and 1711 West 5th Street~~, City of Austin, Travis County, Texas, and generally identified in the map attached as Exhibit "A".

PART 4. This ordinance, together with the attached Exhibits "A" and "B" constitute the land use plan for the Lake Austin Commons PUD (the "PUD") and amends the Original PUD Ordinance, as amended. The PUD shall conform to the limitations and conditions set forth in this ordinance and the Lake Austin Commons planned unit development land use plan (the "PUD land use plan") on record at the Neighborhood Planning and Zoning Department in File No. C814-82-006.01(83). If this ordinance and the attached exhibits conflict, the ordinance applies. ~~Except as otherwise specifically provided by this ordinance, all other rules, regulations and ordinances of the City in effect on the effective date of this ordinance apply to the PUD.~~ Except for water quality and as otherwise specifically provided by this ordinance, all other rules, regulations, and ordinances of the City in effect on July 27, 2006 apply to the PUD. However if the existing parking garage and office building on the property are removed or the site is substantially redeveloped the new development shall comply with current code in effect at the time an application for development is submitted. For the purposes of this PUD amendment, substantial redevelopment shall be defined as adding 125,000 square feet or more of gross floor area to an existing building.

PART 5. The attached exhibits are incorporated into this ordinance in their entirety as though set forth fully in the text of this ordinance. The attached exhibits are as follows:

Exhibit A: Zoning map
Exhibit B: Amended Lake Austin Commons PUD land use plan

PART 6. The following applies to ~~Phase 3 A of the PUD land use plan for~~ the property ~~identified as the parking garage at West 6th Street.~~

REFER TO NEXT PAGE FOR PERMITTED/PROHIBITED USES

1. The following uses are permitted uses on the first floor of the parking garage:

Art gallery	Art workshop
Consumer convenience services	Cultural services
Food sales	General retail sales (convenience)
General retail sales (general)	Park and recreation services
Residential uses	Restaurant (limited)
Restaurant (general)	Consumer repair services
Personal improvement services	Pet services
Veterinary services	

2. Drive-in service use is prohibited as an accessory use to a restaurant use.

PART 7. The Property is subject to Ordinance No. 020926-26 that established the Old West Austin neighborhood plan combining district.

PART 8. In all other respects the terms and conditions of Ordinance No. 821104-F, as amended, remain in effect.

PART 9. This ordinance takes effect on August 7, 2006.

PASSED AND APPROVED

§
§
July 27, 2006 §

Will Wynn
Mayor

APPROVED: David Allan Smith
City Attorney

ATTEST: Shirley A. Gentry
City Clerk

All uses permitted in the Commercial Services (CS) zoning district are permitted on the Property except as provided herein. The following uses are additional permitted uses:

Condominium Residential
Townhouse Residential
Multi-Family Residential
Cocktail Lounge (maximum of 10,000 square feet)

The following uses are prohibited uses in addition to those uses already prohibited in the CS zoning district:

Alternative Financial Services
Automotive Repair Services
Automotive Washing (of any type)
Campground
Equipment Repair Services
Exterminating Services
Kennels
Pawn Shop Services
Limited Warehousing and Distribution
Automotive Rentals
Automotive Sales
Bail Bond Services
Drop-Off Recycling Collection Facility
Equipment Sales
Funeral Services
Laundry Services
Service Station

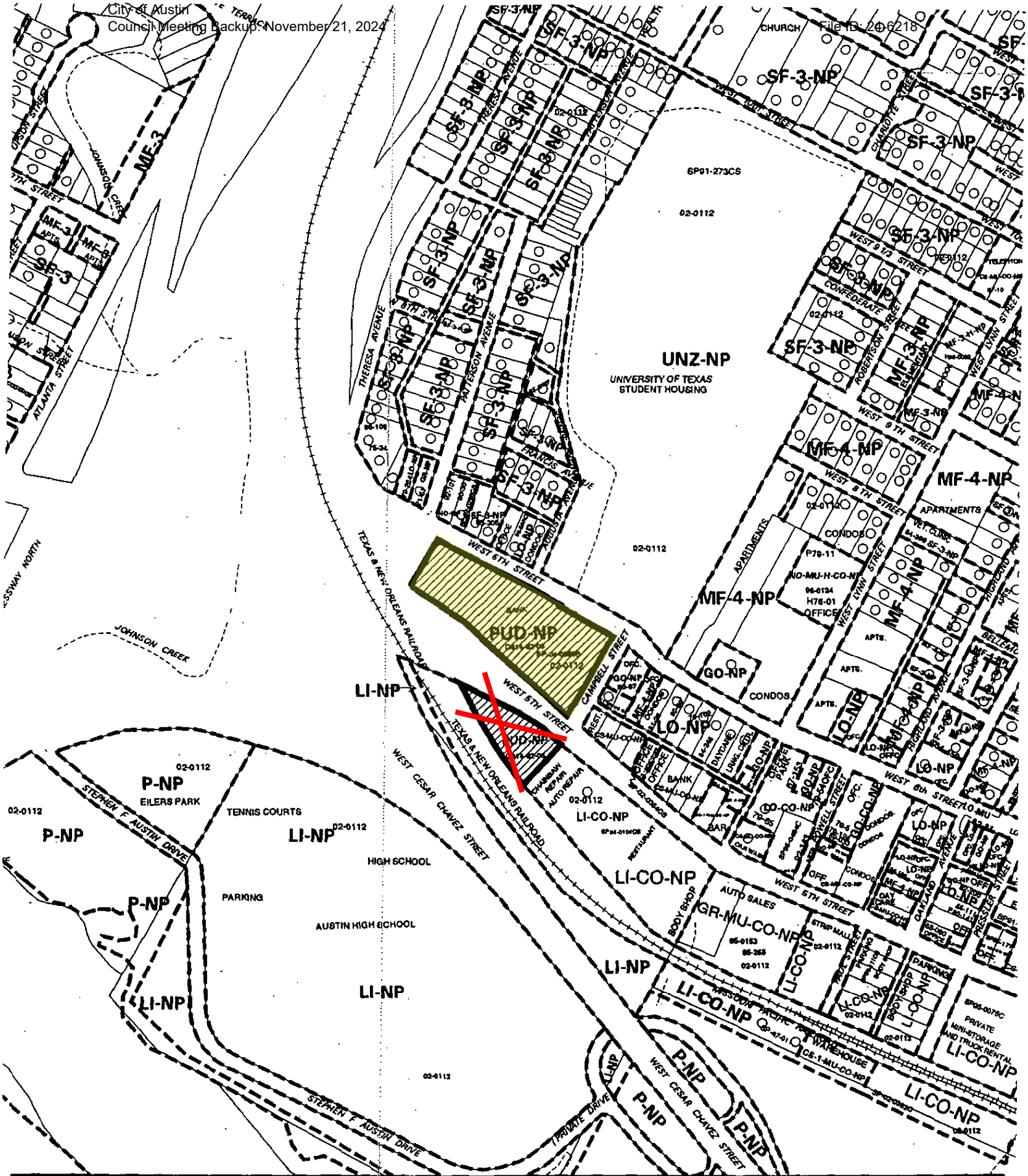
The maximum building height on the Property is 90-FT plus additional height limit exceptions in Section 25-2-531 (Height Limit Exceptions)

The maximum floor-to-area ratio on the Property is 2:1.

ENVIRONMENTAL:
1. New building elements to comply with 2022 AEGB Commercial Guidelines for ST7 Light Pollution Reduction.

2. Proposed new facades above the height of the existing building will achieve an average bird strike threat factor of 30 or less across each new facade as defined by the American Bird Conservancy Bird Threat Material List dated October, 2011.

3. The PUD will provide water quality controls in accordance with Chapter 25-8, Subchapter A, Article 6 (Water Quality Controls) of the Land Development Code in effect at the time of site plan submittal.



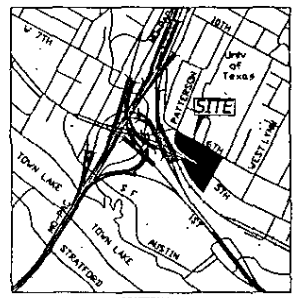
N 1" = 400'	SUBJECT TRACT PENDING CASE ZONING BOUNDARY CASE MGR: T. BOLT	EXHIBIT A PLANNED UNIT DEVELOPMENT CASE #: C814-82-006.01(83) ADDRESS: 1717 W 6TH ST & 1711 W 5TH ST SUBJECT AREA (acres): 4.326 DATE: 05-03 INTLS: SM	CITY GRID REFERENCE NUMBER H23

FULL SIZE REDLINED EXHIBITS ARE PROVIDED SEPARATELY

OWNER: LAKE AUSTIN COMMONS, LTD.
1717 WEST 6TH STREET, SUITE 390
AUSTIN, TEXAS 78703
512.477.1312

P.U.D. SITE PLAN
LAKE AUSTIN COMMONS

1717 W. 6TH STREET
AUSTIN, TEXAS 78703



LOCATION MAP
N.T.S.

INDEX OF SHEETS

1. COVER SHEET
2. PHASE 1-4 SITE PLAN (REVISION 2)
3. PHASE 1-4 SITE PLAN
4. PHASE 1 SITE PLAN
5. PHASE 1 SITE PLAN (ENLARGED)
6. PHASE 1 LANDSCAPE PLAN
7. PHASE 2 SITE PLAN
8. PHASE 2 LANDSCAPE PLAN
9. PHASE 2 SITE GRADING PLAN
10. PHASE 2 SITE GRADING DETAILS
11. PHASE 2 GENERAL DETAILS
12. PHASE 1 AND 2 REVISED SITE PLAN
13. PHASE 3-A SITE PLAN
14. PHASE 3-B SITE PLAN
15. PHASE 4-I SITE PLAN
16. PHASE 4-I LANDSCAPE PLAN
17. PHASE 4 SITE PLAN
18. BUILDING CROSS SECTIONS (ULTIMATE)
19. PHASE 3-A BUILDING SECTIONS
20. BUILDING FOOTPRINTS
21. BUILDING FOOTPRINTS
22. BUILDING FOOTPRINTS
23. BUILDING FOOTPRINTS
24. BUILDING FOOTPRINTS
25. BUILDING FOOTPRINTS

CORRECTIONS

No.	Description	Revise(R)/ Add(A) Sheet No.'s	Total # Sheets in Plan Set	Net Change Imp. Cover	Site Imp. Cover	% Site Imp. Cover	Approved/Date
1	RECONFIG. OF LANDSCAPING PAVERS & PLANTERS OVER FIRST IMP. COVER IN OUTDOOR PLAZA						3-17-83
2	REMODEL 1,945 SF OF RETAIL INTO MEDICAL OFFICE						9-1-93
3	ADDED 8' DIA. SATELLITE ANTENNA ON ROOF OF PHASE 1 BUILDING						1-10-94
4	USE CHANGE OF 330 SF OF RETAIL TO FOOD SALES CORRECTED PARKING TABLE						8-28-96
5	REMODEL LOBBY AND ENCLOSE 450 SF FOR LOBBY EXPANSION CORRECTED PARKING TABLE						10-22-02

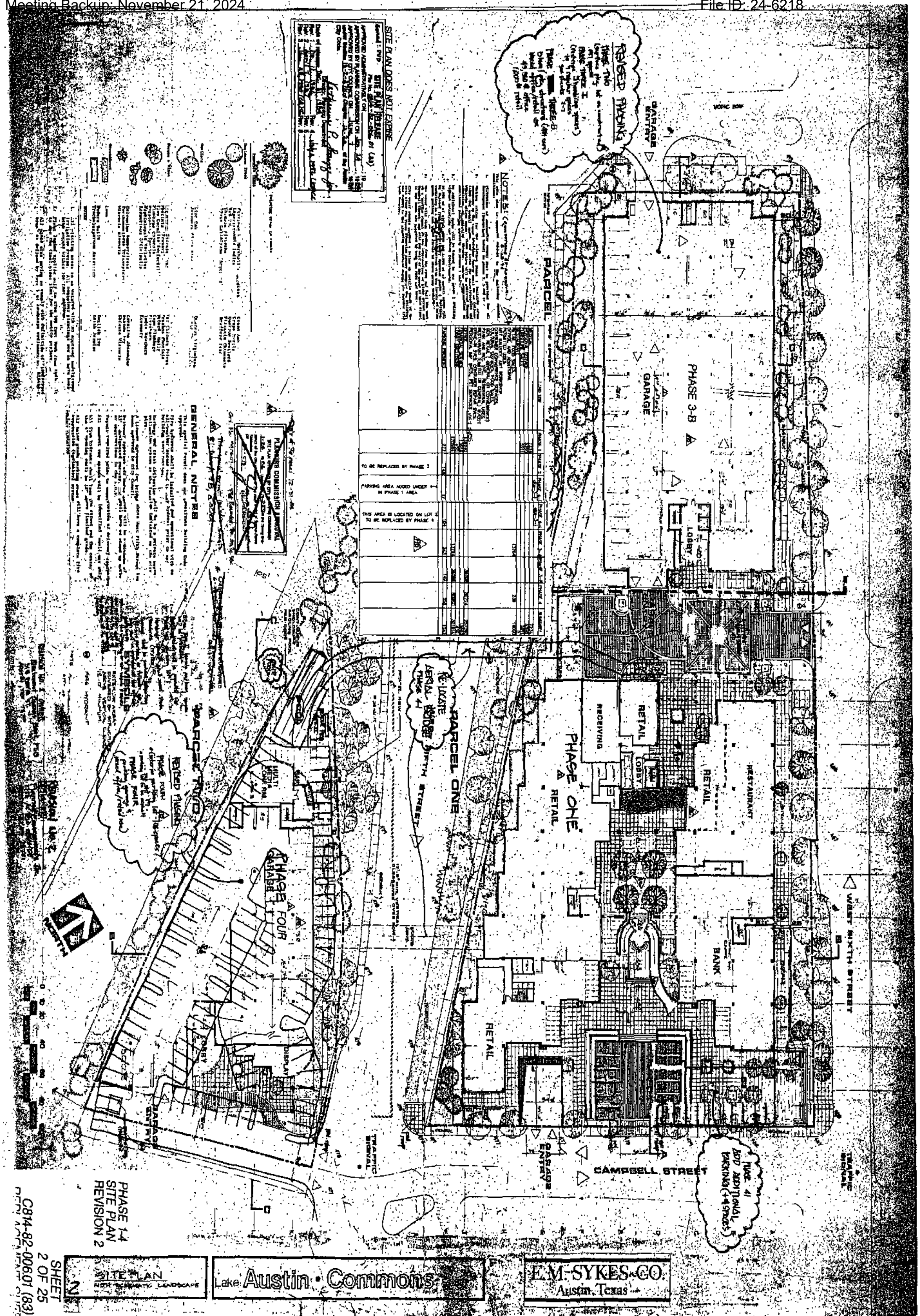
REVISIONS

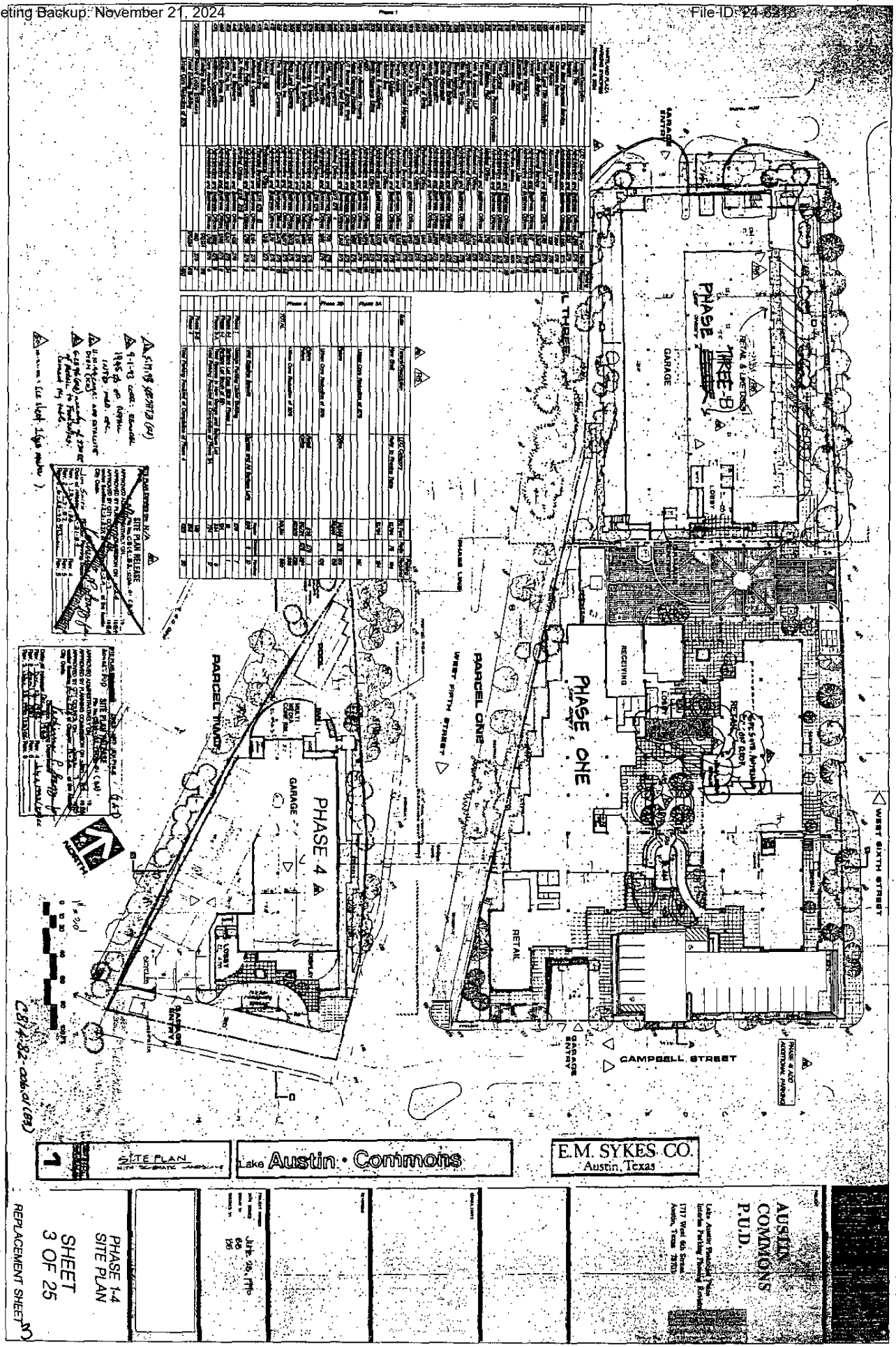
No.	Description	Revise(R)/ Add(A) Sheet No.'s	Total # Sheets in Plan Set	Net Change Imp. Cover	Site Imp. Cover	% Site Imp. Cover	Approved/Date
1							12-12-88
2							[illegible]-7-87
3							6-26-90
4							7-2-93
5	REVISED PHASING, PARKING TABLES BUILDING ELEVATIONS ORGANIZED SHEET ORDER	ADDED SHEET [illegible] REVISED ALL OTHERS	25	-0-			12-21-04
6	CHANGED USE ON 1ST FLOOR GARAGE AND ADDED 1 PARKING SPACE	REVISED 2, 3, 12, 13, 14, 17	25	+167 SF			10-19-05
7	REVISED PARKING AND PHASING TABLES	REVISED 2, 3, 13, 14, 17	25	-0-			

SHEET 1 OF 25

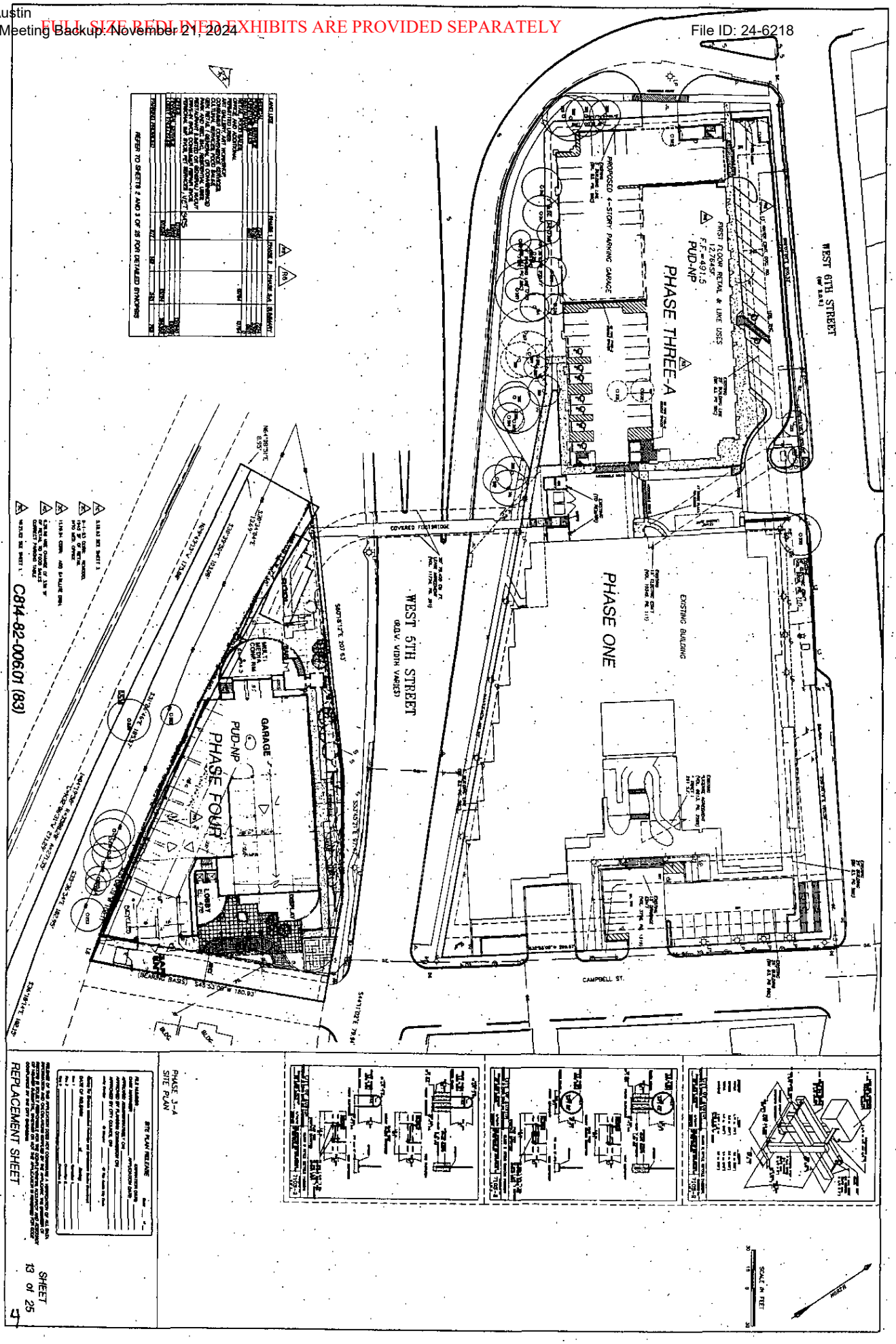
C814-82-006.01 (83)

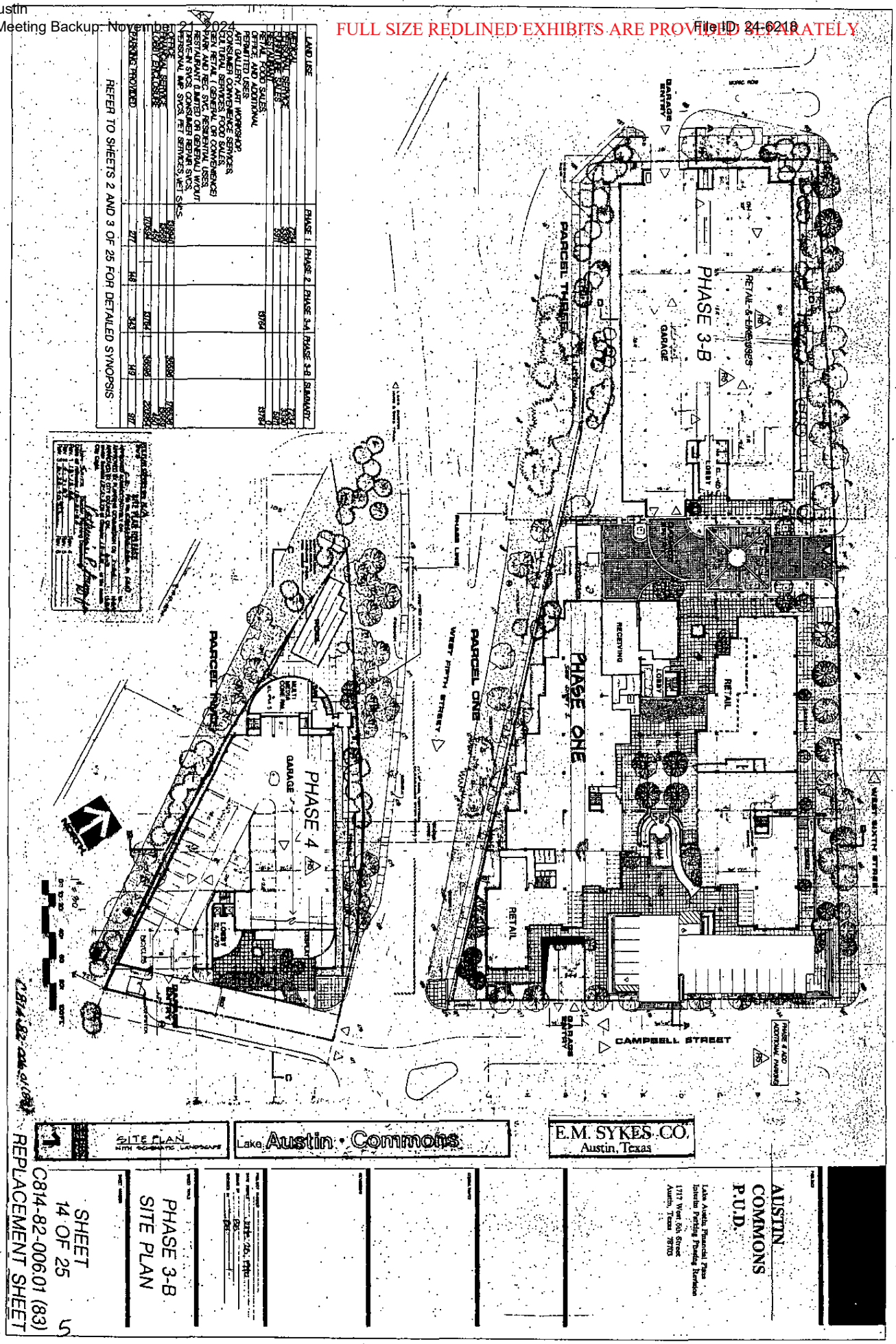
EXHIBIT B
(6 replacement sheets)

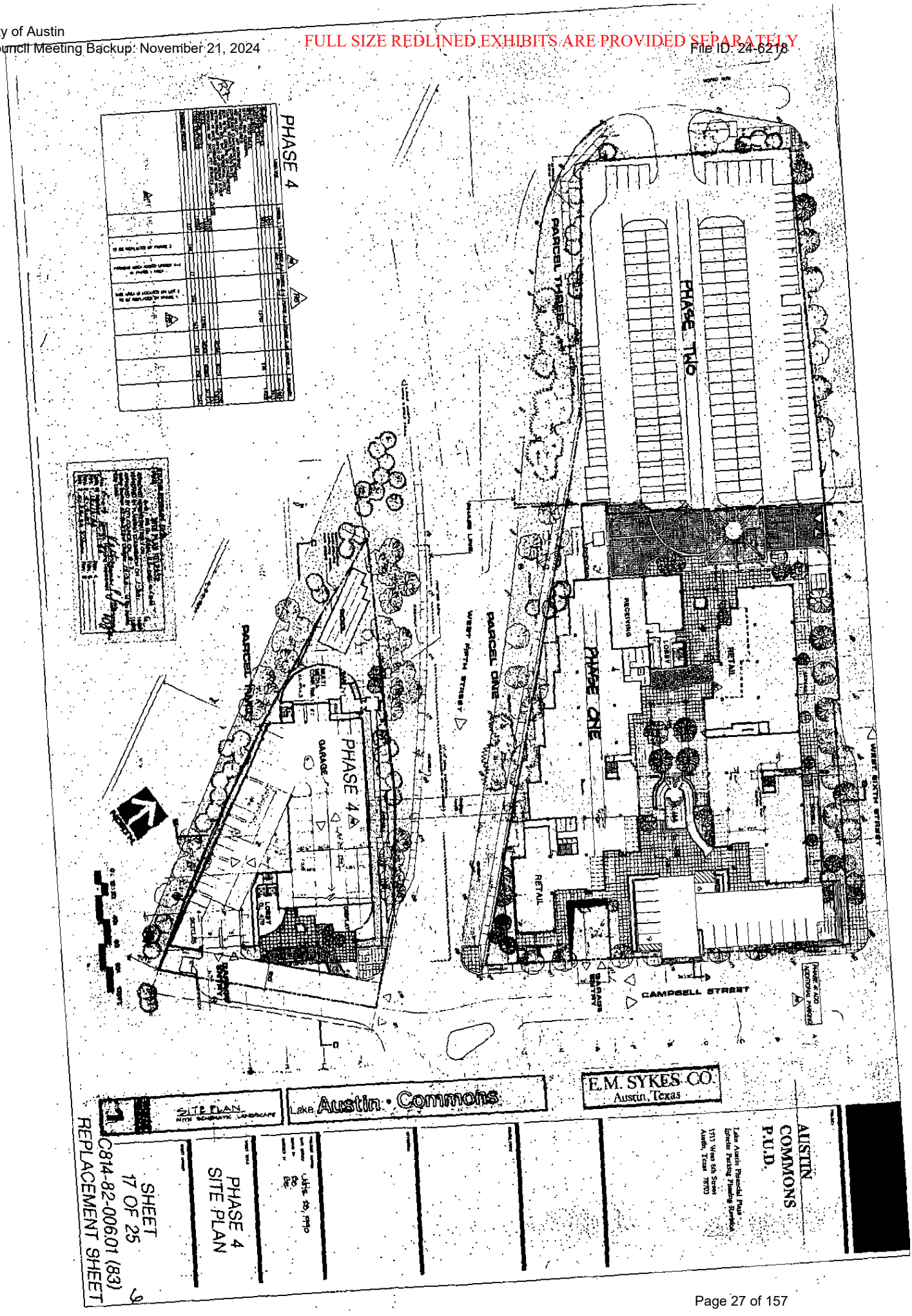

PHASE 3-B
GARAGE
LOBBY
PHASE ONE
RETAIL
RESTAURANT
RECEIVING
BANK
PARCEL ONE
PHASE FOUR
GENERAL NOTES
WEST SIXTH STREET
CAMPBELL STREET
GARAGE ENTRY
TRAFFIC SIGNAL
NORTH
PHASE 1-4
SITE PLAN
REVISION 2
SHEET
2 OF 25
C814-82-006.01 (83)
SITE PLAN
Lake Austin Commons
E.M. SYKES CO.
Austin, Texas


PHASE THREE-B
PHASE ONE
PHASE 4
PARCEL ONE
PARCEL TWO
WEST FIFTH STREET
WEST SIXTH STREET
CAMPBELL STREET
RETAIL
GARAGE
SITE PLAN
Lake Austin • Commons
E.M. SYKES CO.
Austin, Texas
AUSTIN COMMONS P.U.D.
PHASE 1-4 SITE PLAN
SHEET 3 OF 25
REPLACEMENT SHEET

FULL SIZE REDLINED EXHIBITS ARE PROVIDED SEPARATELY




PHASE 3-B
PHASE ONE
PHASE 4
PARCEL THREE
PARCEL ONE
PARCEL FOUR
CAMPBELL STREET
WEST FIFTH STREET
RETAIL
RECEIVING
LOBBY
GARAGE
GARAGE ENTRY
RETAIL ENTRANCES
SITE PLAN
Lake Austin • Commons
E.M. SYKES CO.
Austin, Texas
AUSTIN COMMONS P.U.D.
PHASE 3-B SITE PLAN
SHEET 14 OF 25
C814-82-006.01 (83)
REPLACEMENT SHEET
REFER TO SHEETS 2 AND 3 OF 25 FOR DETAILED SYNOPSIS


PHASE 4
PARCEL THREE
PHASE TWO
PARCEL TWO
PHASE 4
GARAGE
PARCEL ONE
PHASE ONE
RETAIL
RETAIL
CAMPBELL STREET
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E.M. SYKES CO.
Austin, Texas
AUSTIN COMMONS
P.U.D.
PHASE 4
SITE PLAN
SHEET
17 OF 25
C814-82-006.01 (83)
REPLACEMENT SHEET

Additional Public Correspondence Lake Austin Commons PUD Amendment

Email to Jonathan Tomko 9/8/2024 3:12pm
From Frances Barton

Re: Item 8: Rezoning: C814-82-006.02(83) - Lake Austin Commons PUD Amendment; District 9, Location: 1717 West 6th Street and 506 Campbell Street

Owner/Applicant: 1717 Hartland Plaza LP; Agent: Armbrust & Brown, PLLC (Richard T. Shuttle, Jr.)

Request: PUD-NP to PUD-NP, to change in condition of zoning

TO: Jonathan Tomko, Case Manager

DATE: September 8, 2024

FROM: Frances Barton and Dick Leverich, property owners, 701 Patterson Avenue

We live at 701 Patterson Avenue, a distance of 533 feet from our back door to the pickleball court at 1717 West 6th Street. The height of the court elevation is the same elevation as our house. The irregularly spaced, constant, high-pitched clicking sound of the racket hitting the ball is a continuous distraction. Dick, a retired physician, can hear the sound even without his hearing aids. He has a 30 decibel loss of hearing at the frequency of the pickleball sound.

We support the objections raised by the Old West Austin Neighborhood Association (OWANA) to the application. If no agreement is reached by OWANA and the applicant we urge the city to deny the request and encourage the applicant to work with OWANA on a sensible plan.

Thank you for considering our position in support of OWANA.

Sincerely,
Frances Barton and Dick Leverich
701 Patterson Avenue
Austin, Texas 78703

Email to Jonathan Tomko 9/8/2024 9:25pm
From Tommy Dunn

Dear Chair Hempel and Planning Commissioners,
The Old West Austin Neighborhood Association, OWANA, opposes the 1717 W 6th Street PUD Ame ndment changing a condition of zoning. This is not just a rezoning case to get more height, addition al uses or increased FAR. It is also about rectifying a use blatantly non-compliant with current zoning.

Last fall Aquila, the building owner, and Austin Pickle Ranch, a tenant, constructed eight new pickl eball courts on the top level of the existing parking garage. In addition to the courts, five new pole floodlights were installed on the north perimeter adjacent to W 6th Street and the exis

ting security light poles were changed out to include one flood light per pole. These courts are an ill egal use under the current PUD and the improvements were constructed without a building permit.

This new business began operating October 1st, 2023 seven days a week from 8 a.m. to 10 p.m. Wi thin a few weeks
the neighbors began to be concerned about the noise and lights and contacted Aquila to set up a m eeting with Austin Pickle Ranch. The nearby neighbors advised that the noise and light from pickleb all was becoming a nuisance. For weeks after the meeting, no remediation effort was noticed by th e neighbors. Amplified sound was coming from the court area and every night the lights were left o n until sunrise. Another meeting in mid-November between the parties
resulted in an agreement to get back in touch with the neighbors in 45 days. But after 45 days, there was no response. The lights, amplified sound and the repetitive impulsive sound frequency of the p ickleball volleys created a distressing environmental condition and disrupted the quality of life of the immediate neighbors.

In January, Aquila requested a meeting with OWANA's zoning committee. We met on February 1st and were told that
Aquila would be filing an amendment to their PUD and wanted to notify us and discuss the issues t he neighbors were having with pickleball and try to rectify the situation. We were told lights would be turned off at 10:15, light shields would be ordered, mitigation equipment would be considered a nd a sound study would be done. By the end of
February, the perimeter lights were off by 10:15 p.m. but the court lights on the security light poles r emained on until
the end of April and still no light shields had been installed. The neighbors invited Aquila to see wit h their own eyes the effect of the lights and noise ***in*** their homes. Aquila never showed up.

OWANA suggested changing equipment – using quiet rackets and different balls to reduce the nois e, but the building
ownership could not encourage their tenant to comply. Continuing frustration on the part of the nei ghbors led them and OWANA to place a complaint by call to 311 on April 25th. Several neighbors a nd an OWANA representative then met with Council Member Zo on May 7th to discuss the matter. He was helpful in getting the attention of the Code Compliance department for investigation of the complaint. On May 10th a Code Compliance officer met with the tenant
business owner on site and issued a citation to cease the prohibited use until proper zoning and pe rmitting could been obtained. There was no cessation, instead play continued on the courts.
On May 30th the Austin Pickle Ranch presented a sound study to OWANA and the neighbors with re commendations, updated paddle rules, and what they styled as their final attempt to mitigate nois e and lighting issues. The basic vibe
of the delivery was that Austin Pickle Ranch was trying to promote health and happiness and that pi ckleball was not a

problem – **the neighbors are**. Play continued on the courts until the building owners finally locked them out of the
space and had them close the premises on June 7th without ever installing the lighting shields.

The Pickle Ranch sound study did not use industry standard methods for measuring sound, pitch, e tc. that are specific

to the sport. This led OWANA to hire PSM (Pickleball Sound Mitigation) Consulting, a nationally rec ognized pickleball
sound mitigation consultant. See attached report recently received by OWANA. On another atte mpt to reach a compromise last week we suggested the consultant's recommendation to add a 10 foot tall acoustic barrier having a weight of one pound per square foot or greater that would provide a sufficient acoustic remediation to bring the noise down to a reasonable level for the neighbors. A quila has indicated they are unwilling to commit to the compromise. OWANA is running out of patie nce with the applicant's response to its requests and has unfortunately spent an
inordinate amount of time and money discussing and addressing pickleball noise and lighting remediation for a clearly
illegal use. OWANA does not own this problem; Aquila and the Pickle Ranch own this responsibility .

Other aspects of the proposed PUD amendment that concerns the neighborhood are as follows.
1. The added authorization for use by a cocktail lounge in the parking garage.
2. There has been a lack of focus on the hazardous traffic conditions caused by the current illegal use. Since
Pickleball Ranch opened, there has been an increase in cars exiting the Hartland Plaza parking gara ge taking an
illegal right turn to access W. 6th Street. Neighbors exiting Patterson St. onto W. 6th
Street have been run off the road. (See attached diagram). This is a major traffic hazard.
3. There has been an uptick of pickleball players parking in the neighborhood because they are no t wanting to pay the $5 parking garage fee.
4. The lack of proper fencing is a safety concern for players and for stopping balls from flying over t he parapet wall.
5. Aquila is requesting authority to double the height of the building without providing any plans or ideas of how
this will work both in terms of massing,
traffic and pedestrian experience and compatibility with existing uses.
If the developer is willing to commit to a percentage of affordable housing, then OWANA would be more
inclined to accept a height increase. However, Aquila mentioned that is unlikely they will add resid ential for
20 years.

It is the City's and the Planning Commission's responsibility to study the effects of zoning and use c hanges and their consequences. We are unable to reach an agreement for the reason that Aquila is unwilling to adequately address the
problem they created. This PUD amendment is asking for considerable discretionary development authority without
stating clear intentions for usage. And the timing of the development is uncertain, because the Aust in Pickle Ranch was given a seven year lease, for its illegal use.

For these reasons, after repeated efforts to reach a compromise, we oppose this zoning change. W e ask you to validate our position by opposing this application. Denial of the application would sen d a message to developers and owners that
the city will not give in to projects without permits and compliance and later be excused by approvi ng a zoning change to make them compliant without addressing the neighborhood's reasonable re

quests. In other words, in this case, it is not appropriate to ask forgiveness afterwards instead of permission beforehand.
Sincerely,

Thomas B. Dunn
607 Patterson Avenue
Austin, TX 78703

Email to Jonathan Tomko 9/9/2024 11:24 am
From Avery Dunn

Hello COA Planning Commissioners,

Please find the attached opposition letter related to Item 8 in the upcoming Planning Commission Meeting.

As someone who grew up in Clarksville, I love this neighborhood.
I have friends & family that still reside there, I visit often and I am passionately committed to supporting the neighborhood vision.

Throughout my lifetime, there has been successful collaboration between residential neighbors and commercial neighbors. I trust OWANA to to negotiate *reasonable* changes that benefit the greater good.

That said, I've been following this story and I'm concerned about the way that this has been handled thus far.
The content included in the attached letter is a complete and compelling argument that I stand behind 100%.

I urge you to consider the evidence provided to support your decision.

Thank you for taking the time to read this letter, and thank you for you service to the community!

September 8, 2024

RE: C814-82-006.02(83) - Lake Austin Commons PUD Amendment - 1717 West 6th Street - Agenda Item 8

Dear Chair Hempel and Planning Commissioners,

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This new business began operating October 1st, 2023 seven days a week from 8 a.m. to 10 p.m. Within a few weeks the neighbors began to be concerned about the noise and lights and contacted Aquila to set up a meeting with Austin Pickle Ranch. The nearby neighbors advised that the noise and light from pickleball was becoming a nuisance. For weeks after the meeting, no remediation effort was noticed by the neighbors. Amplified sound was coming from the court area and every night the lights were left on until sunrise. Another meeting in mid-November between the parties resulted in an agreement to get back in touch with the neighbors in 45 days. But after 45 days, there was no response. The lights, amplified sound and the repetitive impulsive sound frequency of the pickleball volleys created a distressing environmental condition and disrupted the quality of life of the immediate neighbors.

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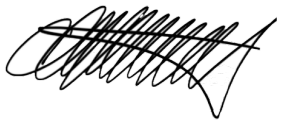
4. The lack of proper fencing is a safety concern for players and for stopping balls from flying over the parapet wall.
5. Aquila is requesting authority to double the height of the building without providing any plans or ideas of how this will work both in terms of massing, traffic and pedestrian experience and compatibility with existing uses. If the developer is willing to commit to a percentage of affordable housing, then OWANA would be more inclined to accept a height increase. However, Aquila mentioned that is unlikely they will add residential for 20 years.

It is the City's and the Planning Commission's responsibility to study the effects of zoning and use changes and their consequences. We are unable to reach an agreement for the reason that Aquila is unwilling to adequately address the problem they created. This PUD amendment is asking for considerable discretionary development authority without stating clear intentions for usage. And the timing of the development is uncertain, because the Austin Pickle Ranch was given a seven year lease, for its illegal use.

For these reasons, after repeated efforts to reach a compromise, we oppose this zoning change. We ask you to validate our position by opposing this application. Denial of the application would send a message to developers and owners that the city will not give in to projects without permits and compliance and later be excused by approving a zoning change to make them compliant without addressing the neighborhood's reasonable requests. In other words, in this case, it is not appropriate to ask forgiveness afterwards instead of permission beforehand.

Sincerely,



Christopher Hurst, AIA
OWANA Chair

PSM CONSULTING LLC
Pickleball Sound Mitigation

Analysis of Pickleball Noise from Pickle Ranch, West 6th Street Austin, TX – Revision 1

by

PSM Consulting LLC

September 7, 2024

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Executive Summary

PSM Consulting LLC (PSMC) used noise modeling software to create sound maps for pickleball noise from the rooftop pickleball courts at Pickle Ranch, West 6th Street, Austin, Texas. Noise levels were estimated at multiple locations in the nearby Old West Austin Neighborhood (OWAN) with particular attention to homes on Francis Avenue and Patterson Avenue. These homes are on a hill at an elevation near the elevation of the rooftop courts. Next, sound barriers of several heights were positioned around the pickleball courts and noise levels were estimated until acceptable sound levels were achieved in the OWAN.

The noise code of the City of Austin has a limit of 75 dBA at a residential property line. This limit has no penalty for impulsive noise and allows impulsive pickleball noise at 75 dBA. This level would be considered very annoying. The city noise code does not properly address noise from pickleball. A noise limit of 50 dB LAFmax that has been successfully used by PSMC to address pickleball noise at pickleball sites was therefore used for this site.

The noise levels from pickleball were 59 dB LAFmax at the property line at 1705 Francis Avenue, which is the closest property line to the Pickle Ranch courts. This noise level would be considered bothersome to residents of this home. Multiple locations were identified with noise levels of 56 dB to 59 dB LAFmax, which are also bothersome. The height and the close spacing of homes on West 6th Street and the close spacing of the homes throughout the neighborhood prevent these sounds from being even louder.

When a 10 foot sound barrier was added on the northeast and northwest sides of the courts, the noise levels were reduced to acceptable levels of 50 dB LAFmax or below. Noise levels at homes farther from the courts are even lower since the homes and the roof lines within the neighborhood function as barriers to block sound.

The two-sided barrier blocks sound to the homes in OWAN that are north of the pickleball courts. The barrier redirects sound to the south where there are no homes. Suppliers of sound barriers are provided with barriers available in color or with printed surfaces to match the architectural requirements of the neighborhood.

Introduction

Pickleball is a game played with two to four players using paddles, a ball, and a net on a court that is approximately one half the length and one half the width of a tennis court. The paddles are made of wood, plastic, or composite materials, and the ball is made of plastic. Each paddle and ball impact during a game creates a short pulse of sound that varies in intensity, duration, and frequency content. For homeowners near pickleball courts, pickleball sounds can become bothersome and intrusive, depending on the distance from the courts and the sound mitigation in place. This annoyance is also because the frequency of a paddle and ball impact is near 1000 Hz, which aligns with the maximum sensitivity of human hearing.

To help explain the details in this sound study, background information is provided on pickleball sound impulses, sound measurements, human hearing, noise ordinances, noise limits, and sound mitigation options.

Pickleball sound levels are presented at several locations in the nearby Old West Austin Neighborhood on a hill that is north of the Pickle Ranch courts. These Pickle Ranch courts are on the fourth floor of the parking garage on West 6th Street and at the same elevation as some of the homes on the hill.

The Sounds of Pickleball

A typical pickleball game will produce a series of random paddle and ball impacts each time the ball is struck. These impacts are described as “popping sounds of varying loudness.” The loudness of each impact varies based on a player’s position on a court, the paddles and balls being used, the skill level of each player, and the force of each impact. Higher skill players will generate louder noise from pickleball via their forceful paddle strikes than lower skill players.

A paddle/ball impact is an impulsive sound with a duration of 10 to 20 milliseconds. The maximum loudness occurs in the first 5 milliseconds. Impulsive sounds are defined as sounds lasting less than one second with an abrupt onset and abrupt decay (1). The highest sound energy occurs in the first 5 milliseconds and then decays to a lower level. The peak acoustical energy is near 1000 Hz, which corresponds with the most sensitive region of human hearing.

In a game of pickleball, a rally will generate several random impacts until the rally is over. A game involves several rallies (and impacts) until a team wins. A typical pickleball game will generate 12 to 15 impacts per minute or 720 to 900 impacts per hour. If multiple courts are in use at the same time, then the number of impacts per hour will be increased by the number of courts. However, not all impacts are of the same loudness. Soft paddle strikes will be barely audible and forceful paddle strikes will be much louder. In addition, the probability of any two paddle strikes occurring at the same time is extremely low. This is because the loudest sound of any one impact lasts only 5 milliseconds or 1/200th of a second. More than 200 courts would have to be in use for two impacts to overlap and increase the loudness of a single impact.

The resulting noise with more courts in use is therefore more pickleball impacts in any period of play and potentially greater annoyance, but not greater loudness.

The goal in noise mitigation is to reduce the loudest impacts to a low enough level so that the loudest impact will not be bothersome. If the loudest impacts are not bothersome, then lower loudness impacts will not be a problem.

To be effective, a noise study must consider the highest noise levels rather than an average noise level. This has been taken into consideration for this noise analysis by considering the loudest noise levels during play.

Measurement of Pickleball Sound

Sound is measured with a sound level meter as shown in Figure 1. The units of sound measurement are decibels, abbreviated as dB. Higher dB levels represent louder sounds.

Figure 1 - Sound Level Meter

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Reference dB levels for common sounds follow.

- 120 dB – ambulance sirens, jet planes at takeoff
- 110 dB - car horns
- 100 dB – factory machinery
- 90 dB – lawnmowers, blenders, power tools
- 80 dB – truck traffic, alarm clocks, garbage disposals
- 70 dB – washing machines, hairdryers, highway noise, city streets
- 60 dB – dishwashing machines, electric toothbrushes
- 50 dB – moderate rainfall, large offices
- 40 dB – refrigerators, quiet offices, quiet residential area
- 30 dB – library, a whisper

These sound levels are what would be heard at approximately 3 feet distance between the source and the listener.

The human ear does not hear all sounds equally. It has more sensitivity in a mid-frequency range of 1000 to 4000 Hz and has diminished sensitivity at frequencies above and below this range. A frequency weighting can be applied to any sound measurement to match the hearing sensitivity of the human ear. This is called the A-weighting. Decibel measurements with the A-weighting are listed as dBA.

Because sound is not constant and varies with time, the sound level meter has several measurement settings to average these sound fluctuations over the measurement period (1). These settings report the sound level for the measurement period selected. The meter setting must be properly selected to capture the sound level based on the duration of the sound and the response time of the human ear.

What meter setting is best for pickleball play? For short duration sounds like pickleball impacts, the fast meter response with an A weighting best corresponds to the averaging time and sensitivity of the human ear (2). A maximum hold setting can also be used. The maximum hold setting “listens” for the maximum sound level within the measurement time interval and continues to update the maximum level. In this manner, the maximum level of these rapid fluctuations can be captured over the measurement period.

The fast meter setting will always measure a higher sound level for a pickleball impact than a slow setting. The slow meter setting averages sound over a longer averaging period that includes intervals with no pickleball impacts. The slow setting is appropriate for continuous noise and for background noise but is not appropriate for pickleball impacts. The slow setting understates the loudness of the short duration pickleball impact heard by the human ear. Different time averaging intervals will therefore report different dB levels for the same sound event.

When the A-weighting setting on a sound level meter is selected, dB measurements are described as dBA. If the sound level (L) is measured with an A-weighting (A) and a fast (F) setting, it is described as LAF. When the maximum level is captured in the measurement interval, this is called LAFmax. Unless otherwise noted, pickleball sounds in this report will be described in units of LAFmax. LAFmax measures the maximum sound, regardless of the number of impacts. If the LAFmax sound level can be reduced through sound mitigation to a low enough level to not be bothersome or not be heard, then the number of impacts (or the number of courts in use) will not be important.

The LAFmax is the preferred metric over LAeq, which is the continuous equivalent-energy level (3). The LAeq is the level of a continuous noise having the same sound energy as a given time-varying noise. For an impulsive noise that is only present for a short period of time, the time averaged LAeq dB level will understate annoyance. For pickleball, the LAeq will be lower than the LAFmax level for the short duration pickleball noise impulse.

LAFmax addresses the maximum sound, regardless of the duration. If the LAFmax is reduced to a low enough level to not be bothersome, then the number of non-bothersome pickleball impacts will not be an issue. The maximum value of the LAFmax noise level to avoid annoyance from pickleball has been determined by PSMC from site evaluations and from human response and is described in a later section.

Noise Maps

Noise maps were created using the dBmap.net Noise Mapping Tool, which is a commercial software (4). The topography of the surrounding area was applied to the noise map before the positions for a noise source and for receivers were selected. Ground elevations were selected from Google Earth. In addition, buildings and homes were added in the vicinity of the pickleball courts. The size of each building together with the roof height were selected from Google Earth and applied to the model for the site. The pickleball noise source was then placed on the court, and the receiver locations were selected. Because this is a European software, all distances, site elevations, building sizes, and barrier heights must be added to the model in meters. The resulting noise maps with distance scales can only be shown in meters. (One meter = 3.3 feet)

All colored noise maps have the legend shown in Figure 2. Each colored band represents a 5 dB change in sound level. The number beside each band indicates the lowest sound level within the band. In addition, sound maps shown in color have white lines within each band of colors to show the 1 dB changes within this 5 dB interval.

For example, the yellow band indicates noise levels from 50 dBA to 54.9 dBA; the orange band indicates noise levels from 55 dBA to 59.9 dBA; and the pink band indicates noise levels from 60 dBA to 64.9 dBA The colors represent increasing sound levels from 30 dBA in dark green to over 80 dBA in dark grey.

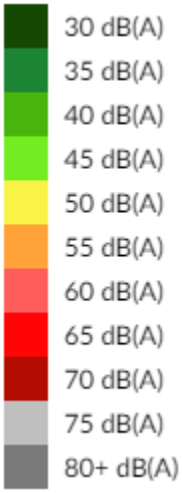

Figure 2 – Color legend for noise maps

All noise maps are shown with north oriented to the top of each map. This provides a link to any local maps which also have north oriented to the top of the map.

Sound Propagation

Sound travels away from its source with a reduction of 6 dB for each doubling of distance from the source. This means that sound decreases in loudness as the distance from the sound source increases. Figure 3 shows sound propagating away from a point source over level ground using the noise modeling software (4). This figure shows the horizontal plane of sound propagation. Each colored ring represents a 5 dB decrease of sound as indicated by the legend. Sound decreases in level as either a listener moves away from a sound source or as the sound source is moved farther away from a stationary listener. (Distances in noise plots can only be shown in meters because the software used is a European software which only displays meters. One meter = 3.3 feet) The 6 dB reduction for every doubling of distance is evident with the increasing diameter of each ring outward from the center.

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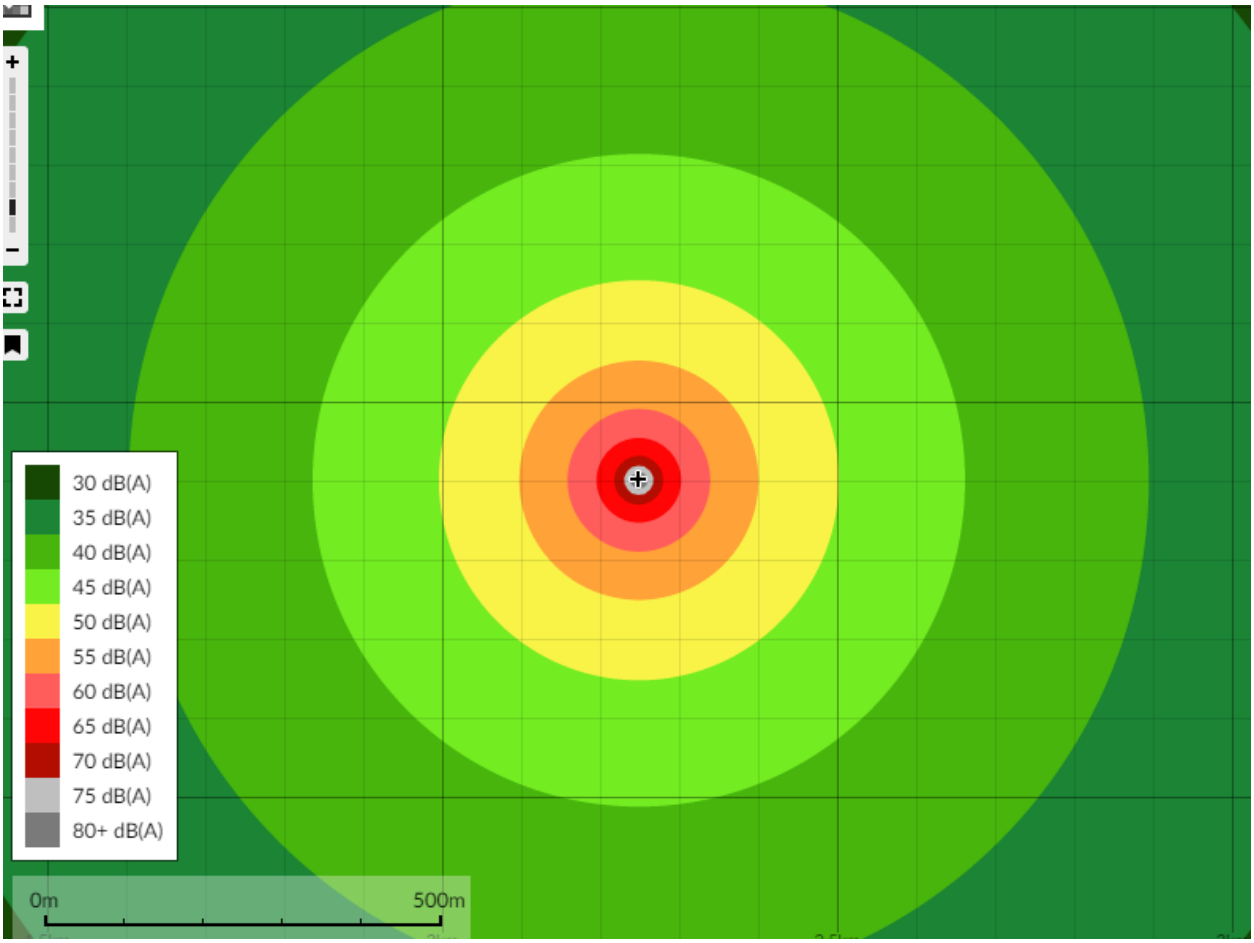

Figure 3 – Sound propagating away from a point source in a horizontal plane (1 meter= 3.3 feet)

Sound also propagates away from a source in the vertical direction. Figure 4 shows a three dimensional view of the vertical plane of sound propagation together with the horizontal plane. (The noise mapping software does not display distances in three dimensional plots.) The three dimensional behavior of sound becomes important to estimate the sound traveling up a hill, to a second story window, over a building, or to an apartment/condominium balcony.

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Figure 4 – Sound propagating away from a point source in a horizontal and vertical plane

Human Hearing and Annoyance

The human ear is sensitive to a sound's level, its frequency content, its duration, and its frequency of occurrence (2). All of these contribute to annoyance. The higher the sound level, the greater the annoyance becomes. The human ear is only sensitive enough to detect a change in sound level of 3 dB. Each 10 dB increase in sound level is perceived as a doubling in the sound level. In the same manner, each decrease of 10 dB is perceived as one half the loudness. A 20 dB increase is perceived as 4 times as loud. Similarly, a 20 dB decrease is perceived as 1/4 as loud.

Hearing is more sensitive to high frequency sounds than to low frequency sounds. Sound measurements made with an A weighting scale match the frequency sensitivity of the human ear. These are described as dBA levels.

Another factor in annoyance is the interval or space between sounds. Intermittent sounds or impulsive sounds are considered more annoying than a steady state sound of the same dB level. All these elements contribute to annoyance and are critical to the noise measurements in noise ordinances.

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While response to noise is subjective and varies among individuals, the following guideline can be used to rate annoyance to LAFmax levels from pickleball for a person of normal hearing sensitivity, regardless of distance from the noise.

- less than 50 dB LAFmax (green zones) – perceptible and acceptable
- 50 to 54.9 dB LAFmax (yellow zones) - marginally bothersome
- 55 to 59.9 dB LAFmax (orange zones) - bothersome
- 60 to 64.9 dB LAFmax (pink zones) – bothersome to annoying
- 65 to 69.9 dB LAFmax (red zones) - annoying
- greater than 70 dB LAFmax (dark red zones) – very annoying

To reduce the annoyance of any noise level, the distance between the source and receiver must be increased or noise control measures must be implemented.

Noise Ordinances

In simple terms, noise is sound that annoys. Community noise ordinances establish noise limits so that noise is neither annoying nor bothersome, even though it may be audible. These ordinances are not intended to establish a limit where sound is inaudible. They are intended to establish a limit where the presence of noise above a background noise level will not be objectionable. The background noise level is the result of wind, trees, birds, normal ambient sounds, and sometimes traffic. Noise ordinances use different noise metrics to quantify the time varying loudness of different types of noise.

Because continuous sounds and impulsive sounds have distinct characteristics that cause them to be perceived differently by human hearing, the noise limits for both types of sounds must be separately stated. This is because the ear responds differently to continuous and impulsive noises.

Austin, TX Noise Ordinance

Chapter 9-2 of the Code of the City of Austin, Texas has a limit of 75 dBA at a residential property line (5). Per item 9-2-1-3, a fast meter response is used for measurement and analysis as this is more applicable to measurement of pickleball impacts than a slow meter response. The ordinance has no added penalty for impulsive noise. A noise level of 75 dBA LAFmax would meet the noise code but would still be annoying to a homeowner. This ordinance does not have sufficient detail to quantify annoyance from pickleball noise.

Recommended PSM Consulting Standard for Pickleball Sound

PSM Consulting (PSMC) has used its experience with pickleball sound measurements to develop an improved standard for pickleball noise. The PSMC noise limit for pickleball noise is based on the background sound. Background sound should be measured using A-weighted equivalent sound level

(LAeq) or A-weighted slow response (LAS). These are both long term averages of sound fluctuations with an A-weighting. These measurements are commonly used for environmental studies of background sound. This PSMC standard sets an LAFmax level as a limit where pickleball sound would not be annoying.

The recommended noise limit at a property line for pickleball play to avoid annoyance follows.

- When the background sound level is at or below 47 dB LAeq, the limit for pickleball noise should be 50 dB LAFmax.
- When the background sound level is above 47 dB LAeq, the limit for pickleball noise should be 3 dB LAFmax above the background level.

These limits refer to noise levels at a property line. This location follows the standard practice for most community noise ordinances of setting limits at a property line. The noise levels at a pool, at a backyard patio, or at the house will be even lower due to the added distance from the property line.

If pickleball courts are in a quiet residential neighborhood with background sound at 47 LAeq, then a limit for pickleball noise at 50 dB LAFmax should be set. With the background sound level at 47 dB LAeq, pickleball impacts at 50 dB LAFmax will be faintly audible. For any lower levels of background sound, pickleball impacts may be perceptible but not bothersome due to the 50 dB LAFmax limit.

Pickleball sound at 50 dB LAFmax should not be bothersome to a person with normal hearing sensitivity for these reasons.

- 50 dB LAFmax is the noise level of a large, busy office.
- 50 dB LAFmax is not loud enough to be objectionable even due to its intermittent nature.

If pickleball courts are near a location with high background noise at 55 LAeq, then a limit for pickleball noise at 58 dB LAFmax (55+3) should be set.

This guideline provides a variable limit for pickleball noise at a property line depending on the background sound levels. Its use has been supported by successful applications at multiple pickleball sites. This standard for pickleball noise is recommended to avoid community or homeowner annoyance from pickleball play.

PSM has successfully applied these limits to several pickleball facilities and to homeowner associations concerned with pickleball noise. They have been used to judge annoyance at specific home locations with no mitigation in place and to confirm the performance of noise mitigation strategies.

The Pickle Ranch, Austin , TX

Figure 5a shows an aerial view from Google Earth of the pickleball courts at the Pickle Ranch (6) together with the nearest homes to the courts in the Old West Austin Neighborhood (OWAN). The topography for the area was taken from Google Earth and was included on the sound map. The area has a hilly terrain with the elevation rising to the north and to the northwest of the courts.

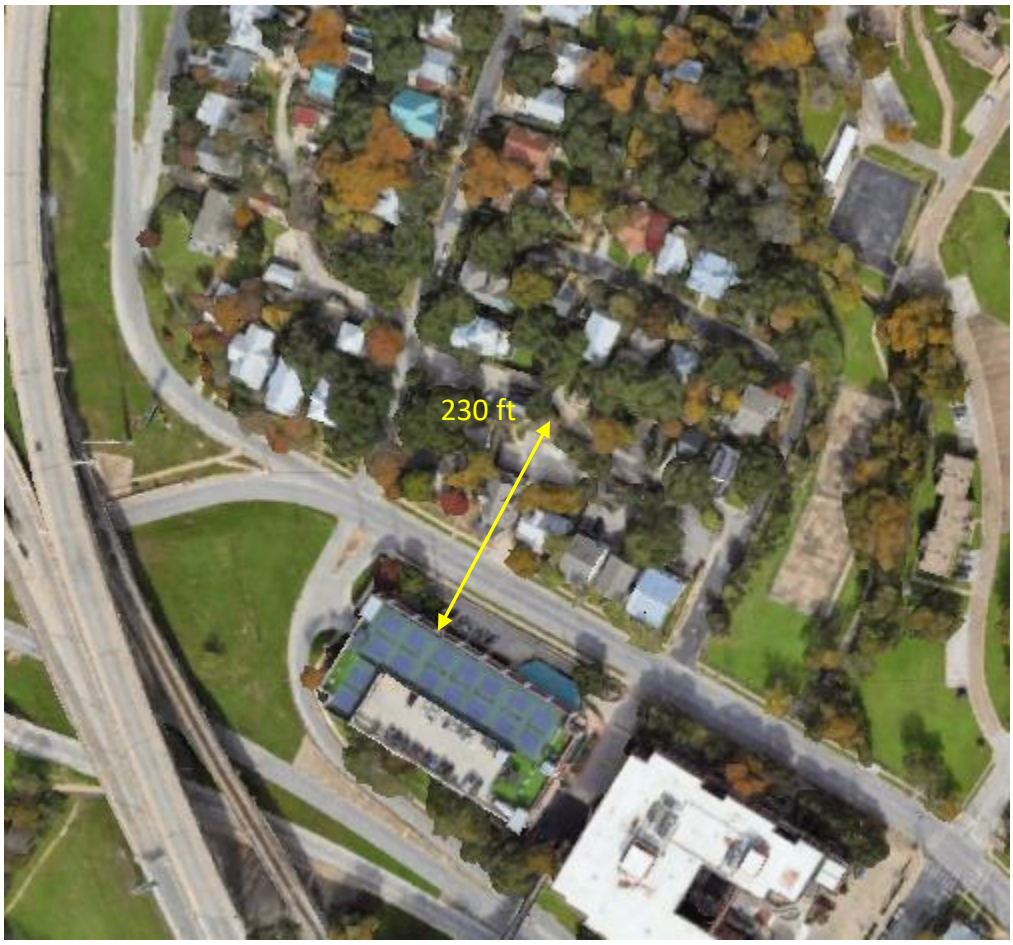

Figure 5a – Pickleball courts at Pickle Ranch and nearby homes in OWAN

Property lines for homes in OWAN were taken from real estate maps on Zillow.com. The closest property line to the pickleball courts is 1709 Francis Avenue, which is approximately 230 feet from the northeast pickleball fence. The dimensions of the homes and the roof heights for nearby homes were taken from Google Earth for inclusion in the noise map. Figure 5b shows a three dimensional view of the homes and the pickleball courts that were included in the model.

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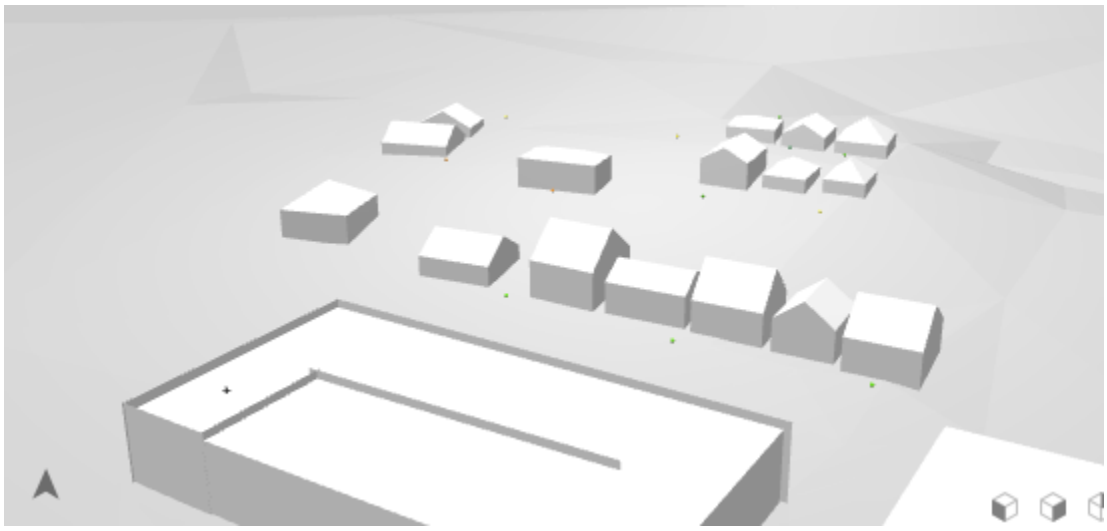

Figure 5b – Pickleball courts at Pickle Ranch and nearby homes in OWAN – three dimensional model

Figure 6 shows a cross section, a land contour, from the courts on West 6th Street to the homes on Francis Street. The courts on the fourth floor of the parking garage are at the level of the roof lines of the 1 and 2 story homes on Francis Avenue.

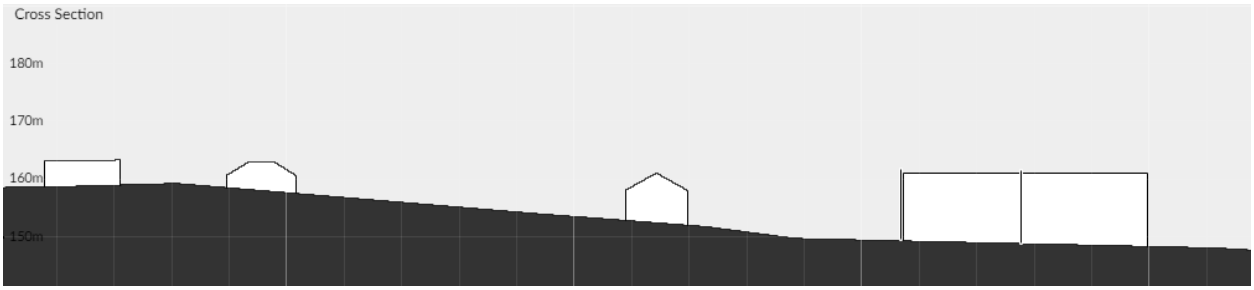

Figure 6 – Cross section of contour from West 6th Street to Francis Avenue

Per Figures 3 and 4, pickleball noise can come from any location on a pickleball court when a player strikes a ball. Pickleball noise travels away from the source in all directions. The loudest pickleball noises will occur in the primary direction of ball travel across the net. In addition, the positions of players change frequently during a game so that some shots (and the direction of sound) will continually change. The noise map will display noise levels in all directions away from the courts. Four court positions were selected on the rooftop to show the influence of line of sight noise propagation from these source positions into the neighborhood. These courts are numbered 1, 2, 3, and 4 in Figure 7. The noise analysis will show the relationship between the source location (the court) and distance to a receiver (a home) and the effect of homes that block sound traveling along a direct line of sight or a reflected path between a source and receiver.

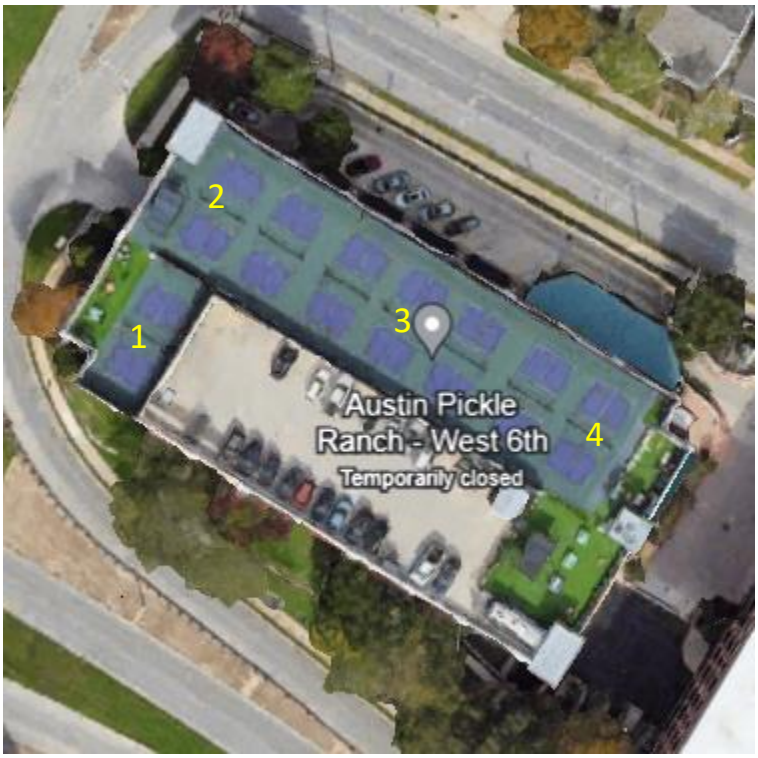

Figure 7 – Pickleball court numbers

The background noise level was assumed to be 47 dB LAeq which is typical of a residential neighborhood. The PSMC noise limit of 50 dB LAFmax was therefore used.

Figures 8a, 8b, 8c, and 8d show the noise levels at multiple locations in OWAN with pickleball play on courts 1, 2 3, and 4, respectively. The white circles indicate LAFmax levels in dB at each location at a height of 1.5 meters or 5 feet. This height is ear level for most people. Noise levels above 50 dB LAFmax occur at multiple locations and would be bothersome.

Figure 8a – Noise levels in OWAN from court 1

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Figure 8b – Noise levels in OWAN from court 2

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Figure 8c – Noise levels in OWAN from court 3

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Figure 8d – Noise levels in OWAN from court 4

Table 1 shows the noise levels at 6 property locations based on pickleball play from these four courts. The highest noise level at each property is indicated and the court that creates this highest noise level is listed. The highest noise level was 59 dB LAFmax at 1705 Francis Avenue. This was with pickleball play on court 3. This noise level is considered bothersome and borders on being annoying. Court 3 and then court 2 were selected as worst case scenarios for noise propagation to OWAN to evaluate noise mitigation strategies.

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Table 1 – Noise level summary

	LAFmax				Highest	Noise
Receiver	**court 1**	**court 2**	**court 3**	**court 4**	**LAFmax**	**Source**
606 Patterson Avenue - front yard	56	58	57	55	58	Ct 2
607 Patterson Avenue - side yard	55	58	57	42	58	Ct 2
1709 Francis Avenue - back yard	42	47	58	50	58	Ct 3
1705 Francis Avenue - back yard	54	56	59	46	59	Ct 3
1704 Francis Avenue - front yard	38	38	56	44	56	Ct 3
1702 Francis Avenue - front yard	41	41	56	45	56	Ct 3

Figures 9a and 9b show color noise maps for noise from court 3 and court 2, respectively, for the surrounding areas of OWAN. Any areas not in a green zone are above the target of 50 dB LAFmax. A dark green zone is better than a light green zone as dark green indicates an even lower noise level. This figure highlights several points about noise propagation to each home in OWAN.

- With no homes to block a direct line of sight to the courts, noise levels decrease with distance from the courts.
- Homes along West 6th Steet and throughout the neighborhood block sound traveling away from the courts.
- It is quieter on the side of the house away from the courts than on the side facing the courts.
- A shadow zone exists on the side of the house away from the courts – the house and the roof line function as sound blockers or barriers.
- Through this blocking effect, it is possible to have lower sound levels near the courts than farther from the courts that are in a direct line of sight.
- The space between houses “channels” sound deep into the neighborhood until it is blocked by another house. This is evident with yellow/orange bands of sound propagation between houses.
- Through this channeling effect, it is possible to have higher sound levels farther from the courts than near the courts - depending on the line of sight.

Figure 10 shows a cross section of noise levels through the noise source on court 3 and up the hill to Francis Avenue. The shadow zone effect of the roof lines is more clearly seen here.

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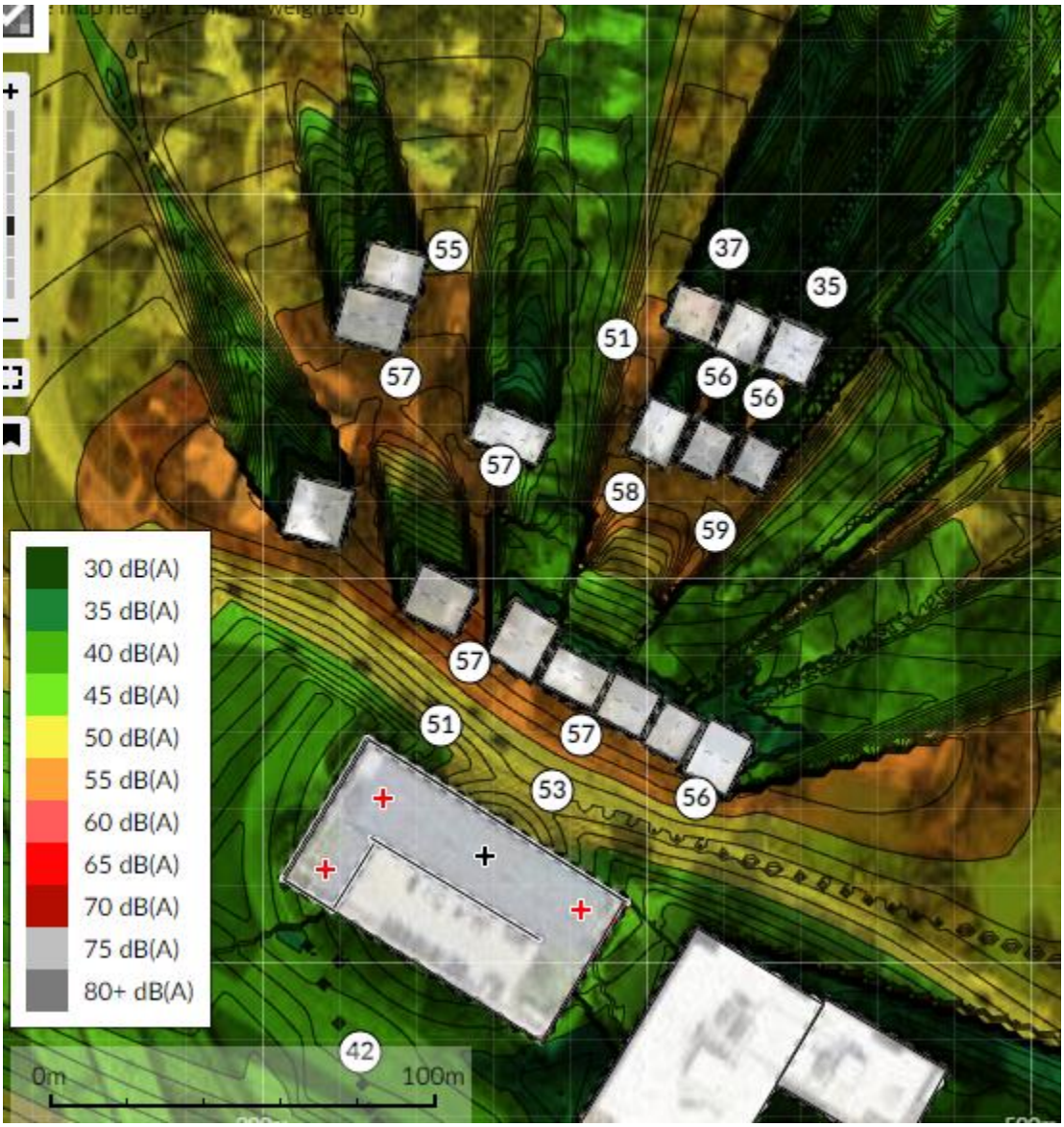

Figure 9a – Noise levels in OWAN from court 3

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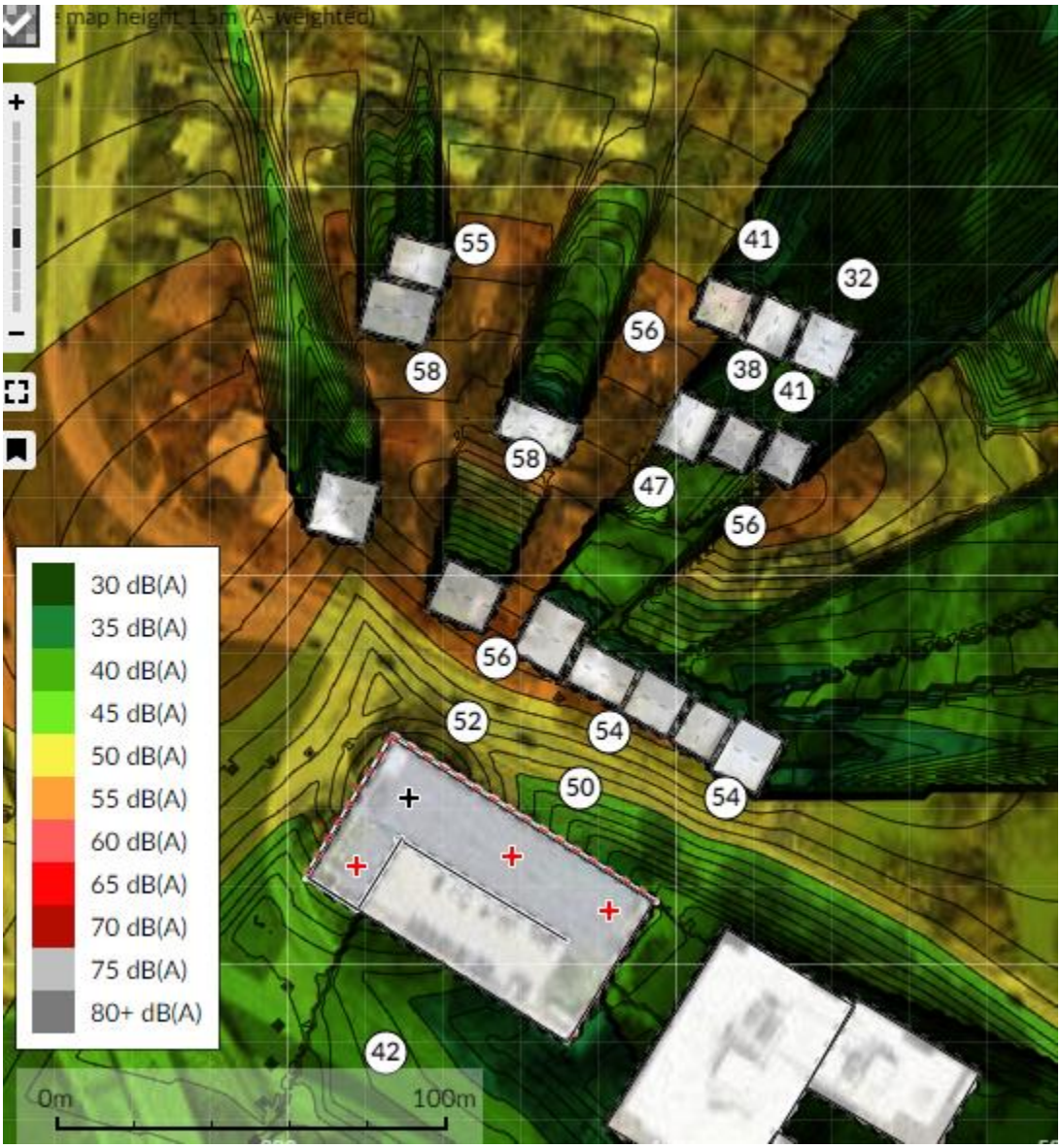

Figure 9b – Noise levels in OWAN from court 2

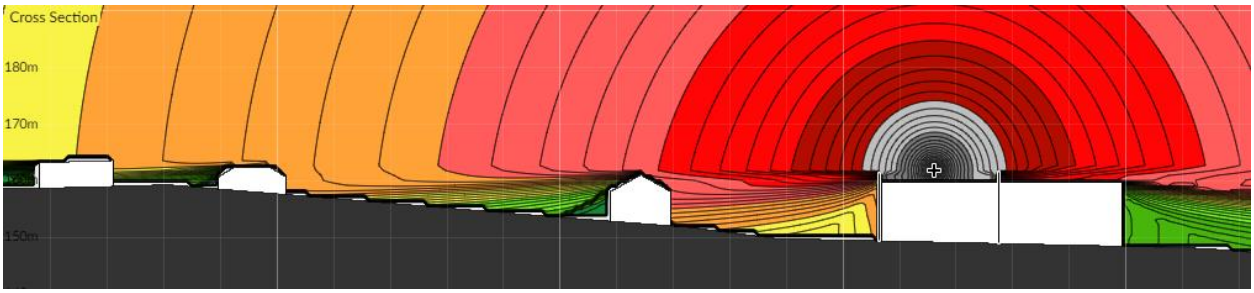

Figure 10 – Noise levels in OWAN from court 3 – cross section through noise source to northeast

Noise mitigation strategies were next evaluated to create green noise zones for homes in OWAN. The most effective noise mitigation option is a noise barrier to block sound. A noise barrier was placed on the northeast and northwest perimeter of the rooftop pickleball courts. (A description of sound barriers and suppliers is presented in Appendix A.)

The height of the barrier was evaluated at 6, 7, 8, and 10 feet. Only the 10 foot barrier was able to reduce the noise level to 50 dB LAFmax. This is because a 6 foot tall pickleball player with a 2 foot arm extension is striking an overhead smash at 8 feet above the court surface. This 10 foot barrier is more effective than a shorter barrier and is required for the greatest noise reduction. Figures 11a and 11b show that the 10 foot sound barrier reduced noise at the critical homes to 50 dBA LAFmax or below for play on courts 3 and 3, respectively.

Figure 11a – Noise levels in OWAN from court 3 with 10 foot sound barrier on northeast and northwest perimeter

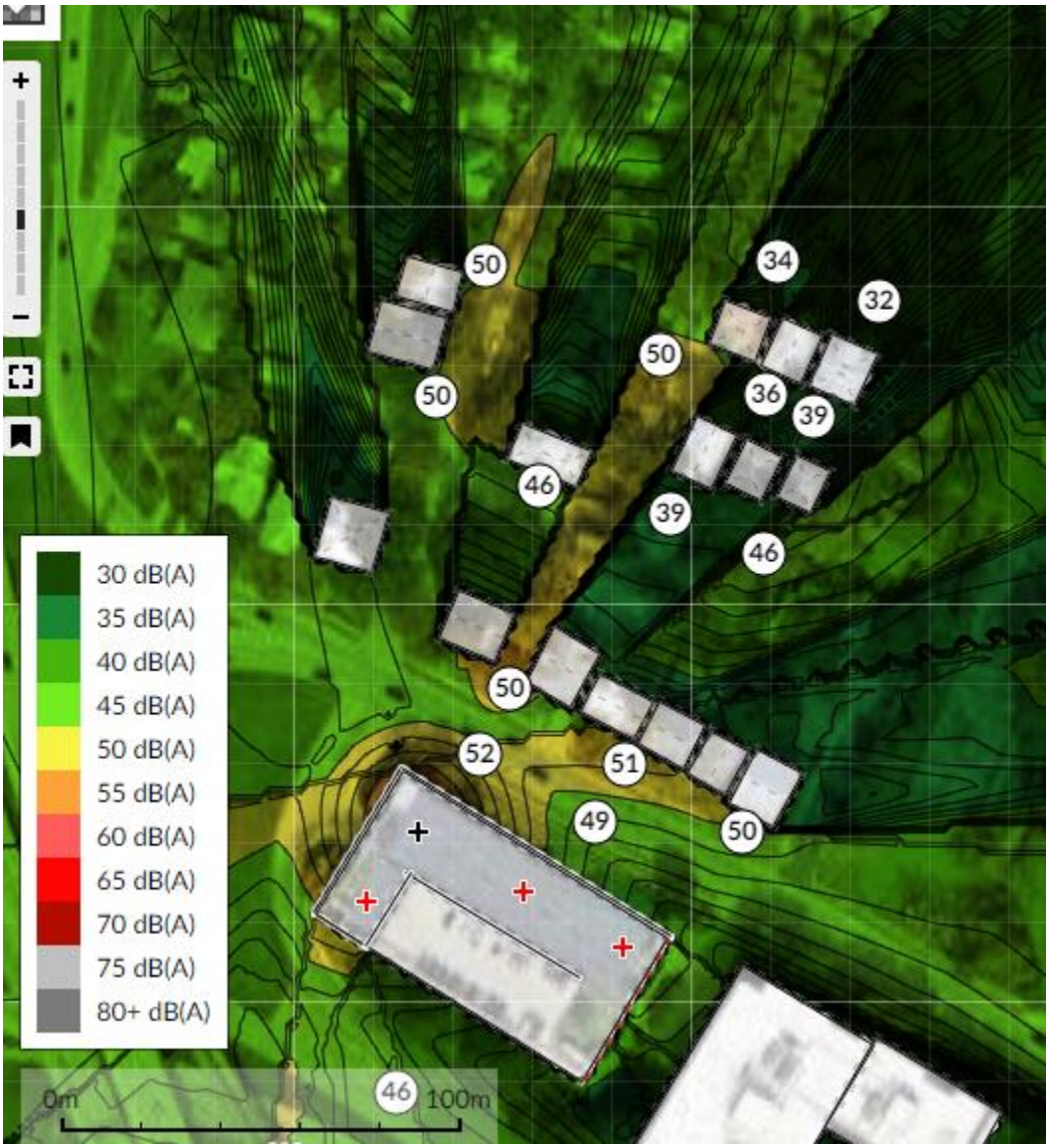

Figure 11b – Noise levels in OWAN from court 2 with 10 foot sound barrier on northeast and northwest perimeter

A color comparison between Figures 9a and 11a and between Figures 9b and 11 b shows the change in noise level (loudness) with the 10 foot barrier. Figures 11a and 11 b show more green zones. An expanded view of the noise maps showed that the yellow zones in both figures are 51 dB LAFmax and would not be different audibly to 50 dB LAFmax.

Table 2 shows the before and after noise levels at the 6 homes with the noise reduction provided by the 10 foot barrier for the 2 different courts. The noise reduction at these homes changes due to differences in the line of sight, the distances to homes, and the presence of homes that help to block sound. The noise reduction via the barriers was 6 to 13 dB LAFmax from court 3 and 2 to 12 dB LAFmax from court 2.

Table 2 – Noise level reduction with 10 foot sound barriers

	LAFmax from court 3			LAFmax from court 2		
Receiver	**Before**	**After**	**Reduction**	**Before**	**After**	**Reduction**
606 Patterson Avenue - front yard	57	50	7	58	50	8
607 Patterson Avenue - side yard	57	44	13	58	46	12
1709 Francis Avenue - back yard	58	47	11	47	39	8
1705 Francis Avenue - back yard	59	50	9	56	46	10
1704 Francis Avenue - front yard	56	50	6	38	36	2
1702 Francis Avenue - front yard	56	50	6	41	39	2

Compared to Figure 10, Figure 12 shows the cross section of sound propagation with the 10 foot barrier at the edge of the rooftop courts. This barrier blocks noise that previously would be at the rooftop level at Francis Avenue.

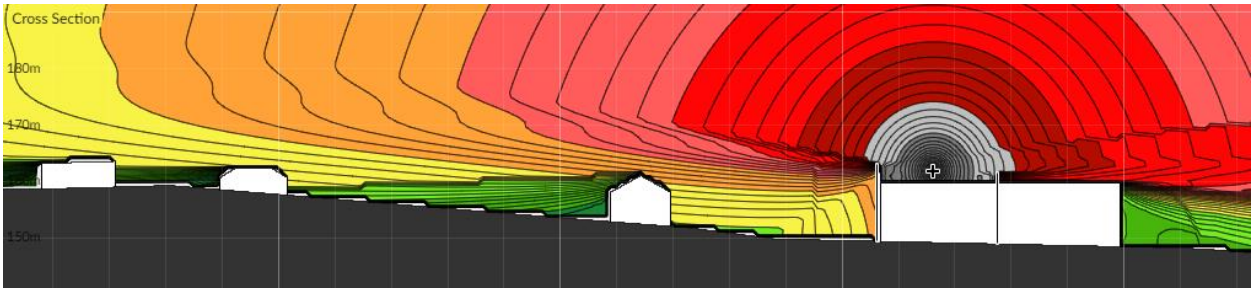

Figure 12 – Noise levels in OWAN from court 3 with 10 foot sound barrier – cross section to northeast

Figure 13 shows a three dimensional view of the courts and the homes in OWAN that were included in the sound map together with the noise levels from the sound map. The 10 foot barrier height on the northeast and northwest boundaries of the roof top courts is evident when compared to the roof line in Figure 5 b. The noise levels in the yellow zones are 51 dB LAFmax and would not be perceived differently than 50 dB LAFmax.

The sound level on the south side of the courts at ground level increased from 42 dB LAFmax to 46 dB LAFmax for play on courts 2 and 3. This shows that the barrier is redirecting noise away from the OWAN homes and to the south. With no homes to the south, this is a reasonable approach to noise mitigation.

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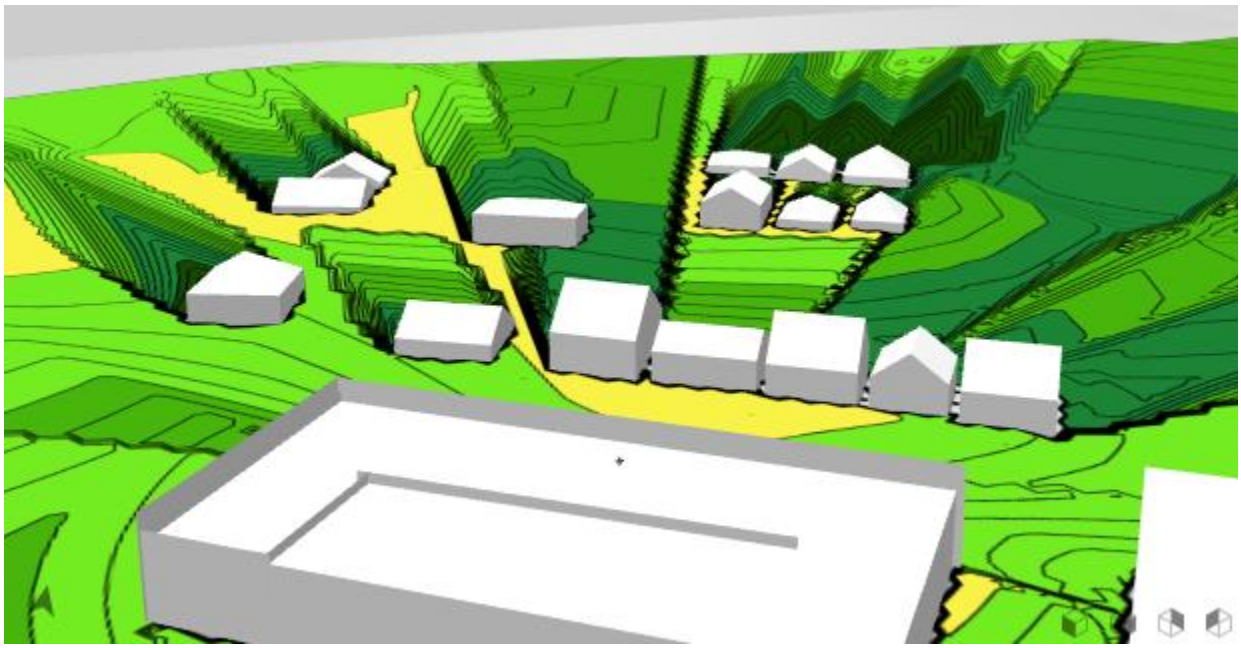

Figure 13 – Noise levels in OWAN from court 3 with 10 foot sound barrier – 3D view

This two-sided barrier design for pickleball noise mitigation offers several benefits to the residents of OWAN.

- The barrier is high enough to block sound at the rooftop level for the ground level of homes in OWAN that are at an elevation near the fourth story courts on West 6th Street.
- The barrier reduces noise to a level where it will not be bothersome to a person with normal hearing sensitivity.
- The barrier redirects sound to the south where there are no residential properties.
- Higher background sound than 47 dB LAeq from traffic to the west will further help mask the pickleball impacts.

This two-sided barrier design for pickleball noise mitigation offers several benefits to the pickleball courts at Pickle Ranch.

- The barrier provides a successful sound mitigation strategy that allows the courts to operate in a commercial area near a residential zone.
- The 2-sided barrier eliminates the higher cost of a 4-sided barrier enclosure.
- The 2-sided barrier avoids sound reflections from opposite barrier walls that can often be redirected back to the nearby homes. This can lead to more expensive options such as higher barrier walls or barriers with sound absorbing liners.
- The barrier design does not require higher priced sound barriers with sound absorbing liners on the court side.
- The 2-sided barrier allows an open court design for air circulation and for minimizing heat build-up on the courts.

Conclusions

The following conclusions are made from the results in this study.

1. The noise code of the City of Austin does not have sufficient detail to quantify the annoyance from pickleball. PSMC used a target of 50 dB LAFmax as a recommended noise limit.
2. Noise levels from rooftop pickleball from the Pickle Ranch are 59 dB to 56 dB LAFmax at property lines on Francis Avenue and Patterson Avenue. These levels would be considered bothersome and annoying.
3. These noise levels will be present with play on any of the 8 courts in use at the Pickle Ranch.
4. A 10 foot sound barrier on the northeast and northwest sides of the rooftop pickleball courts reduced noise to acceptable levels for homes in OWAN.
5. The noise reduction with this barrier ranged from 2 dB to 13 dB LAFmax depending on the court in use and on the distance and direction of the home from the courts.

Recommendations

The following recommendations are made for the noise reduction from pickleball play at Pickle Ranch.

1. For the noise from pickleball play to be acceptable to the residents of OWAN, a 10 foot sound barrier is needed on the northeast and northwest perimeter of the rooftop courts.
2. The barrier should be 1 pound per square foot or greater to reduce pickleball noise. It does not need a more expensive sound absorbing liner on the court side.
3. The color and design of the barrier should be compatible with the architectural requirements of the surrounding area.

PSM LLC has provided these recommendations on reductions of pickleball noise at Pickle Ranch to balance the growth and popularity of pickleball with required noise level reduction for nearby residents of OWAN. The goal is to address quality of life for the residents living near the pickleball courts. PSMC LLC is available to answer any questions related to this work.

Disclaimer

The results, conclusions, and recommendations presented here are based on information provided to PSMC LLC by the client and on measurements made using calibrated equipment and standard acoustical practices. These results are intended to address maximum noise levels from play. Pickleball sound assessment is a random process where the noise from each impact and from each game can vary based on player skill, force of impact, and equipment in use. Sound levels from pickleball are random impulsive events, meaning that it is predictable over a range and has averages and other statistical characteristics, but it has no exact single level. Actual sound levels will vary over time. In addition, it is not possible to determine what any particular person believes is an acceptable sound level. Because additional variables may be associated with the site, the players, or the equipment in use, PSMC LLC assumes no liability for work undertaken by the client based on these recommendations, or for results that do not conform to the client's expectations.

Barry R Wyerman, PhD, PE
Principal Acoustical Consultant
PSM Consulting LLC

Rev 1 – September 7, 2024
Recommendation number 3 - Removed PSM Consulting's mention of specific colors for a sound barrier to allow the barrier to be of any color or design compatible with the architectural requirements of the surrounding area.

Reference Sources

1. ANSI S1.4 Specification for Sound Level Meters
2. Handbook of Acoustics, Everest, F, Alton and Pohlmann, Ken C., fifth edition, 1979.
3. ANSI S12.9 Quantities and Procedures for Description and Measurement of Environmental Sound
4. https://noisetools.net/dbmap/ - Noise Mapping Tool
5. Noise code of the City of Austin, Texas https://library.municode.com/tx/austin/codes/code_of_ordinances?nodeId=TIT9PRAC_CH9-2NOAMSO
6. Austin, Texas, West 6th Street - Google Earth https://earth.google.com/web/@30.27633413,-97.76498553,150.16854646a,634.9930276d,35y,0.00019926h,0t,0r/data=OgMKATA

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PSMC LLC Information

PSM Consulting LLC

PSMC LLC was created in 2022 after 8 years of pickleball noise studies and advice on pickleball noise mitigation. This work included field measurements of pickleball play at multiple sites, analysis of the noise from different pickleball paddles and balls, consultation with USA Pickleball on equipment standards, and evaluation of suppliers of noise barrier systems. PSMC has designed successful noise reduction systems for pickleball courts and has evaluated multiple paddles and balls to create lists of "quieter" paddles and balls. It has also completed field studies of pickleball noise to provide guidance to homeowners regarding local noise ordinances. In total, PSMC has completed or has been involved in noise surveys and recommended noise mitigations measures for 100 pickleball sites. PSMC is at the forefront of pickleball technology and is working directly with USA Pickleball to develop acoustical test methods for paddles, to identify quieter gear, and to create improved community standards for pickleball noise. It is also working with paddle manufacturers to help bring improved, quieter paddles to the market. PSMC LLC has developed the industry's first anechoic chamber for testing both pickleball paddles and balls under controlled speed conditions. This provides baseline data on paddles without the variables of background noise and player skill in hitting the ball.

The mission of PSMC is to support pickleball clubs, pickleball players, communities, parks and recreation departments, country clubs, and homeowner associations with an understanding of pickleball noise and of strategies and measures to control pickleball noise.

Barry Wyerman, PhD, PE

Barry Wyerman, PhD, is the Principal Acoustical Consultant for PSMC LLC. He is a pickleball player and a USA Pickleball Level 2 Referee. His professional background includes over 45 years of acoustical experience in creating innovative acoustical products, solving industrial noise control and vibration problems, and designing solutions for automotive noise and vibration control. He is the owner of Acoustical Design and Consulting, LLC, which provides engineering and consulting support in all areas of acoustics and noise control. He has a BS degree in physics from Ohio University and MS and PhD degrees in engineering acoustics from Penn State University. He became involved in pickleball noise mitigation when he provided initial recommendations on pickleball noise control from his work experience and acoustical training. His professional associations include:

- The Acoustical Society of America
- Society of Automotive Engineers, Noise and Vibration Committee
- Society of Automotive Engineers, Acoustical Materials Committee
- Professional Engineer, registered in Ohio

Appendix A - Sound Barriers

Sound barriers block the direct path of sound as it travels from a source to a receiver. A barrier must be massive enough to block sound that could pass through it. The recommended weight for a barrier is one pound per square foot. A small amount of sound still passes over the top or around the edges of a barrier. This is called diffracted sound. With this weight barrier, the sound reduction is limited only by the height and width of the barrier.

The barrier must be solid with no holes, no gaps at the bottom, and no gaps between adjoining panels. Any holes or openings will allow sound to leak to the other side. Earth mounds and buildings can function as barriers if they are high enough and wide enough to disrupt a direct path of sound.

Shrubs, bushes, and trees are NOT barriers even though they block a line of sight. They are not massive enough and not solid enough to block sound. A small amount of sound attenuation may be achieved with a dense planting of hedges, but this would not provide more than 1 dB sound reduction even if the hedges were 3 or 4 feet in depth and 12 feet high. These are primarily a visual barrier.

The effectiveness of a high mass barrier is controlled primarily by its height and then by its width. The barrier must be tall enough and wide enough so that it minimizes the sound that is diffracted or bent over the top and around the edge. The amount of sound diffracted over the top and around the edge can be minimized as the barrier becomes higher and longer. As the height of a sound barrier increases, a point of diminishing returns is reached. This means that a percentage increase in height (and cost) will result in a lower percentage improvement (or return on benefits) in noise reduction. In some cases, it may be best to enclose all four sides of a pickleball court with the highest barrier possible. If there are no homes exposed to pickleball sound from a side of the court, then a barrier can be eliminated on that side.

Common vendors for sound barriers are:

- Acoustiblok, Tampa, FL, 813-980-1400, https://acoustiblok.com/acoustiblok-soundproofing-product-lines/acoustifence-noise-reducing-fences/ (printed barriers)
- Insul-Quilts USA, South El Monte, CA, 833-853-6444, https://www.insulquilt.com/
- eNoise Control, Noblesville, IN, 866-481-2024, https://www.enoisecontrol.com/
- DDS Acoustical Specialties, Westfield, MA 413-248-8118, https://ddsacoustical.com/
- Hushtec USA, Connecticut, 860-289-8033, https://hushtecusa.com/ (clear barriers)
- Putterman Athletics LLC, DeLand, FL, 800-621-0146, https://www.puttermanathletics.com/
- FenceScreen, Grand Prairie, TX, 888-313-6613, https://www.fencescreen.com/

All barriers of the same weight would perform the same. None of these products are noticeably different other than by the color or by printing. Any differences in product sheets can be due to lab differences in testing. Noise barriers should weigh one pound per square foot to block any sound that could pass through the barrier. The effectiveness of this high weight barrier can still be compromised by the sound that is

diffracted over the top or around an edge. A contractor must be consulted to assure that an existing fence or a new fence can support the added weight of a barrier. Wind loads on the barrier are also to be considered.

Some barriers are available with a sound absorbing lining material on the side facing the noise source – if this is needed. This sound absorbing lining can reduce the noise level on the court by reducing the reflected sound as it bounces between the side walls. It can also be effective in reducing reflected sound in the opposite direction away from a barrier if only one side of a court has a barrier. However, the sound absorbing lining has no impact on the sound passing over the top of the barrier. This direct path of sound is not influenced by anything on the side walls. The sound absorbing liner is more for noise reduction for the players than for any nearby residents exposed to sound.

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Google
ILLEGAL RIGHT
TURN

Email from Carol Wagner

To; Jonathan Tomko

9/9/24 5:17pm

September 8, 2024

RE: C814-82-006.02(83) - Lake Austin Commons PUD Amendment - 1717 West 6th Street - Agenda Item 8

Dear Chair Hempel and Planning Commissioners,

The Old West Austin Neighborhood Association, OWANA, opposes the 1717 W 6th Street PUD Amendment changing a condition of zoning. This is not just a rezoning case to get more height, additional uses or increased FAR. It is also about rectifying a use blatantly non-compliant with current zoning.

Last fall Aquila, the building owner, and Austin Pickle Ranch, a tenant, constructed eight new pickleball courts on the top level of the existing parking garage. In addition to the courts, five new pole floodlights were installed on the north perimeter adjacent to W 6th Street and the existing security light poles were changed out to include one flood light per pole. These courts are an illegal use under the current PUD and the improvements were constructed without a building permit.

This new business began operating October 1st, 2023 seven days a week from 8 a.m. to 10 p.m. Within a few weeks the neighbors began to be concerned about the noise and lights and contacted Aquila to set up a meeting with Austin Pickle Ranch. The nearby neighbors advised that the noise and light from pickleball was becoming a nuisance. For weeks after the meeting, no remediation effort was noticed by the neighbors. Amplified sound was coming from the court area and every night the lights were left on until sunrise. Another meeting in mid-November between the parties resulted in an agreement to get back in touch with the neighbors in 45 days. But after 45 days, there was no response. The lights, amplified sound and the repetitive impulsive sound frequency of the pickleball volleys created a distressing environmental condition and disrupted the quality of life of the immediate neighbors.

In January, Aquila requested a meeting with OWANA's zoning committee. We met on February 1st and were told that Aquila would be filing an amendment to their PUD and wanted to notify us and discuss the issues the neighbors were having with pickleball and try to rectify the situation. We were told lights would be turned off at 10:15, light shields would be ordered, mitigation equipment would be considered and a sound study would be done. By the end of February, the perimeter lights were off by 10:15 p.m. but the court lights on the security light poles remained on until the end of April and still no light shields had been installed. The neighbors invited Aquila to see with their own eyes the effect of the lights and noise ***in*** their homes. Aquila never showed up.

OWANA suggested changing equipment – using quiet rackets and different balls to reduce the noise, but the building ownership could not encourage their tenant to comply. Continuing frustration on the part of the neighbors led them and OWANA to place a complaint by call to 311 on April 25th. Several neighbors and an OWANA representative then met with Council Member Zo on May 7th to discuss the matter. He was helpful in getting the attention of the Code Compliance department for investigation of the complaint. On May 10th a Code Compliance officer met with the tenant business owner on site and issued a citation to cease the prohibited use until proper zoning and permitting could been obtained. There was no cessation, instead play continued on the courts.
On May 30th the Austin Pickle Ranch presented a sound study to OWANA and the neighbors with recommendations, updated paddle rules, and what they styled as their final attempt to mitigate noise and lighting issues. The basic vibe of the delivery was that Austin Pickle Ranch was trying to promote health and happiness and that pickleball was not a

problem – **the neighbors are**. Play continued on the courts until the building owners finally locked them out of the space and had them close the premises on June 7th without ever installing the lighting shields.

The Pickle Ranch sound study did not use industry standard methods for measuring sound, pitch, etc. that are specific to the sport. This led OWANA to hire PSM (Pickleball Sound Mitigation) Consulting, a nationally recognized pickleball sound mitigation consultant. See attached report recently received by OWANA. On another attempt to reach a compromise last week we suggested the consultant's recommendation to add a 10 foot tall acoustic barrier having a weight of one pound per square foot or greater that would provide a sufficient acoustic remediation to bring the noise down to a reasonable level for the neighbors. Aquila has indicated they are unwilling to commit to the compromise. OWANA is running out of patience with the applicant's response to its requests and has unfortunately spent an inordinate amount of time and money discussing and addressing pickleball noise and lighting remediation for a clearly illegal use. OWANA does not own this problem; Aquila and the Pickle Ranch own this responsibility.

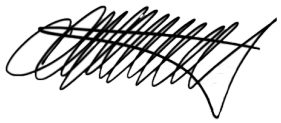
Other aspects of the proposed PUD amendment that concerns the neighborhood are as follows.

1. The added authorization for use by a cocktail lounge in the parking garage.
2. There has been a lack of focus on the hazardous traffic conditions caused by the current illegal use. Since Pickleball Ranch opened, there has been an increase in cars exiting the Hartland Plaza parking garage taking an illegal right turn to access W. 6th Street. Neighbors exiting Patterson St. onto W. 6th Street have been run off the road. (See attached diagram). This is a major traffic hazard.
3. There has been an uptick of pickleball players parking in the neighborhood because they are not wanting to pay the $5 parking garage fee.
4. The lack of proper fencing is a safety concern for players and for stopping balls from flying over the parapet wall.
5. Aquila is requesting authority to double the height of the building without providing any plans or ideas of how this will work both in terms of massing, traffic and pedestrian experience and compatibility with existing uses. If the developer is willing to commit to a percentage of affordable housing, then OWANA would be more inclined to accept a height increase. However, Aquila mentioned that is unlikely they will add residential for 20 years.

It is the City's and the Planning Commission's responsibility to study the effects of zoning and use changes and their consequences. We are unable to reach an agreement for the reason that Aquila is unwilling to adequately address the problem they created. This PUD amendment is asking for considerable discretionary development authority without stating clear intentions for usage. And the timing of the development is uncertain, because the Austin Pickle Ranch was given a seven year lease, for its illegal use.

For these reasons, after repeated efforts to reach a compromise, we oppose this zoning change. We ask you to validate our position by opposing this application. Denial of the application would send a message to developers and owners that the city will not give in to projects without permits and compliance and later be excused by approving a zoning change to make them compliant without addressing the neighborhood's reasonable requests. In other words, in this case, it is not appropriate to ask forgiveness afterwards instead of permission beforehand.

Sincerely,



Christopher Hurst, AIA
OWANA Chair

PSM CONSULTING LLC
Pickleball Sound Mitigation

Analysis of Pickleball Noise from Pickle Ranch, West 6th Street Austin, TX – Revision 1

by

PSM Consulting LLC

September 7, 2024

PSM Consulting LLC
Bonita Springs, Florida
wyerbr@sbcglobal.net, 248 563 0867

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Executive Summary

PSM Consulting LLC (PSMC) used noise modeling software to create sound maps for pickleball noise from the rooftop pickleball courts at Pickle Ranch, West 6th Street, Austin, Texas. Noise levels were estimated at multiple locations in the nearby Old West Austin Neighborhood (OWAN) with particular attention to homes on Francis Avenue and Patterson Avenue. These homes are on a hill at an elevation near the elevation of the rooftop courts. Next, sound barriers of several heights were positioned around the pickleball courts and noise levels were estimated until acceptable sound levels were achieved in the OWAN.

The noise code of the City of Austin has a limit of 75 dBA at a residential property line. This limit has no penalty for impulsive noise and allows impulsive pickleball noise at 75 dBA. This level would be considered very annoying. The city noise code does not properly address noise from pickleball. A noise limit of 50 dB LAFmax that has been successfully used by PSMC to address pickleball noise at pickleball sites was therefore used for this site.

The noise levels from pickleball were 59 dB LAFmax at the property line at 1705 Francis Avenue, which is the closest property line to the Pickle Ranch courts. This noise level would be considered bothersome to residents of this home. Multiple locations were identified with noise levels of 56 dB to 59 dB LAFmax, which are also bothersome. The height and the close spacing of homes on West 6th Street and the close spacing of the homes throughout the neighborhood prevent these sounds from being even louder.

When a 10 foot sound barrier was added on the northeast and northwest sides of the courts, the noise levels were reduced to acceptable levels of 50 dB LAFmax or below. Noise levels at homes farther from the courts are even lower since the homes and the roof lines within the neighborhood function as barriers to block sound.

The two-sided barrier blocks sound to the homes in OWAN that are north of the pickleball courts. The barrier redirects sound to the south where there are no homes. Suppliers of sound barriers are provided with barriers available in color or with printed surfaces to match the architectural requirements of the neighborhood.

Introduction

Pickleball is a game played with two to four players using paddles, a ball, and a net on a court that is approximately one half the length and one half the width of a tennis court. The paddles are made of wood, plastic, or composite materials, and the ball is made of plastic. Each paddle and ball impact during a game creates a short pulse of sound that varies in intensity, duration, and frequency content. For homeowners near pickleball courts, pickleball sounds can become bothersome and intrusive, depending on the distance from the courts and the sound mitigation in place. This annoyance is also because the frequency of a paddle and ball impact is near 1000 Hz, which aligns with the maximum sensitivity of human hearing.

To help explain the details in this sound study, background information is provided on pickleball sound impulses, sound measurements, human hearing, noise ordinances, noise limits, and sound mitigation options.

Pickleball sound levels are presented at several locations in the nearby Old West Austin Neighborhood on a hill that is north of the Pickle Ranch courts. These Pickle Ranch courts are on the fourth floor of the parking garage on West 6th Street and at the same elevation as some of the homes on the hill.

The Sounds of Pickleball

A typical pickleball game will produce a series of random paddle and ball impacts each time the ball is struck. These impacts are described as “popping sounds of varying loudness.” The loudness of each impact varies based on a player’s position on a court, the paddles and balls being used, the skill level of each player, and the force of each impact. Higher skill players will generate louder noise from pickleball via their forceful paddle strikes than lower skill players.

A paddle/ball impact is an impulsive sound with a duration of 10 to 20 milliseconds. The maximum loudness occurs in the first 5 milliseconds. Impulsive sounds are defined as sounds lasting less than one second with an abrupt onset and abrupt decay (1). The highest sound energy occurs in the first 5 milliseconds and then decays to a lower level. The peak acoustical energy is near 1000 Hz, which corresponds with the most sensitive region of human hearing.

In a game of pickleball, a rally will generate several random impacts until the rally is over. A game involves several rallies (and impacts) until a team wins. A typical pickleball game will generate 12 to 15 impacts per minute or 720 to 900 impacts per hour. If multiple courts are in use at the same time, then the number of impacts per hour will be increased by the number of courts. However, not all impacts are of the same loudness. Soft paddle strikes will be barely audible and forceful paddle strikes will be much louder. In addition, the probability of any two paddle strikes occurring at the same time is extremely low. This is because the loudest sound of any one impact lasts only 5 milliseconds or 1/200th of a second. More than 200 courts would have to be in use for two impacts to overlap and increase the loudness of a single impact.

The resulting noise with more courts in use is therefore more pickleball impacts in any period of play and potentially greater annoyance, but not greater loudness.

The goal in noise mitigation is to reduce the loudest impacts to a low enough level so that the loudest impact will not be bothersome. If the loudest impacts are not bothersome, then lower loudness impacts will not be a problem.

To be effective, a noise study must consider the highest noise levels rather than an average noise level. This has been taken into consideration for this noise analysis by considering the loudest noise levels during play.

Measurement of Pickleball Sound

Sound is measured with a sound level meter as shown in Figure 1. The units of sound measurement are decibels, abbreviated as dB. Higher dB levels represent louder sounds.

Figure 1 - Sound Level Meter

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Reference dB levels for common sounds follow.

- 120 dB – ambulance sirens, jet planes at takeoff
- 110 dB - car horns
- 100 dB – factory machinery
- 90 dB – lawnmowers, blenders, power tools
- 80 dB – truck traffic, alarm clocks, garbage disposals
- 70 dB – washing machines, hairdryers, highway noise, city streets
- 60 dB – dishwashing machines, electric toothbrushes
- 50 dB – moderate rainfall, large offices
- 40 dB – refrigerators, quiet offices, quiet residential area
- 30 dB – library, a whisper

These sound levels are what would be heard at approximately 3 feet distance between the source and the listener.

The human ear does not hear all sounds equally. It has more sensitivity in a mid-frequency range of 1000 to 4000 Hz and has diminished sensitivity at frequencies above and below this range. A frequency weighting can be applied to any sound measurement to match the hearing sensitivity of the human ear. This is called the A-weighting. Decibel measurements with the A-weighting are listed as dBA.

Because sound is not constant and varies with time, the sound level meter has several measurement settings to average these sound fluctuations over the measurement period (1). These settings report the sound level for the measurement period selected. The meter setting must be properly selected to capture the sound level based on the duration of the sound and the response time of the human ear.

What meter setting is best for pickleball play? For short duration sounds like pickleball impacts, the fast meter response with an A weighting best corresponds to the averaging time and sensitivity of the human ear (2). A maximum hold setting can also be used. The maximum hold setting “listens” for the maximum sound level within the measurement time interval and continues to update the maximum level. In this manner, the maximum level of these rapid fluctuations can be captured over the measurement period.

The fast meter setting will always measure a higher sound level for a pickleball impact than a slow setting. The slow meter setting averages sound over a longer averaging period that includes intervals with no pickleball impacts. The slow setting is appropriate for continuous noise and for background noise but is not appropriate for pickleball impacts. The slow setting understates the loudness of the short duration pickleball impact heard by the human ear. Different time averaging intervals will therefore report different dB levels for the same sound event.

When the A-weighting setting on a sound level meter is selected, dB measurements are described as dBA. If the sound level (L) is measured with an A-weighting (A) and a fast (F) setting, it is described as LAF. When the maximum level is captured in the measurement interval, this is called LAFmax. Unless otherwise noted, pickleball sounds in this report will be described in units of LAFmax. LAFmax measures the maximum sound, regardless of the number of impacts. If the LAFmax sound level can be reduced through sound mitigation to a low enough level to not be bothersome or not be heard, then the number of impacts (or the number of courts in use) will not be important.

The LAFmax is the preferred metric over LAeq, which is the continuous equivalent-energy level (3). The LAeq is the level of a continuous noise having the same sound energy as a given time-varying noise. For an impulsive noise that is only present for a short period of time, the time averaged LAeq dB level will understate annoyance. For pickleball, the LAeq will be lower than the LAFmax level for the short duration pickleball noise impulse.

LAFmax addresses the maximum sound, regardless of the duration. If the LAFmax is reduced to a low enough level to not be bothersome, then the number of non-bothersome pickleball impacts will not be an issue. The maximum value of the LAFmax noise level to avoid annoyance from pickleball has been determined by PSMC from site evaluations and from human response and is described in a later section.

Noise Maps

Noise maps were created using the dBmap.net Noise Mapping Tool, which is a commercial software (4). The topography of the surrounding area was applied to the noise map before the positions for a noise source and for receivers were selected. Ground elevations were selected from Google Earth. In addition, buildings and homes were added in the vicinity of the pickleball courts. The size of each building together with the roof height were selected from Google Earth and applied to the model for the site. The pickleball noise source was then placed on the court, and the receiver locations were selected. Because this is a European software, all distances, site elevations, building sizes, and barrier heights must be added to the model in meters. The resulting noise maps with distance scales can only be shown in meters. (One meter = 3.3 feet)

All colored noise maps have the legend shown in Figure 2. Each colored band represents a 5 dB change in sound level. The number beside each band indicates the lowest sound level within the band. In addition, sound maps shown in color have white lines within each band of colors to show the 1 dB changes within this 5 dB interval.

For example, the yellow band indicates noise levels from 50 dBA to 54.9 dBA; the orange band indicates noise levels from 55 dBA to 59.9 dBA; and the pink band indicates noise levels from 60 dBA to 64.9 dBA The colors represent increasing sound levels from 30 dBA in dark green to over 80 dBA in dark grey.

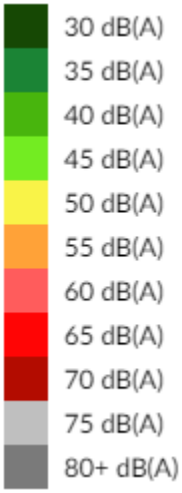

Figure 2 – Color legend for noise maps

All noise maps are shown with north oriented to the top of each map. This provides a link to any local maps which also have north oriented to the top of the map.

Sound Propagation

Sound travels away from its source with a reduction of 6 dB for each doubling of distance from the source. This means that sound decreases in loudness as the distance from the sound source increases. Figure 3 shows sound propagating away from a point source over level ground using the noise modeling software (4). This figure shows the horizontal plane of sound propagation. Each colored ring represents a 5 dB decrease of sound as indicated by the legend. Sound decreases in level as either a listener moves away from a sound source or as the sound source is moved farther away from a stationary listener. (Distances in noise plots can only be shown in meters because the software used is a European software which only displays meters. One meter = 3.3 feet) The 6 dB reduction for every doubling of distance is evident with the increasing diameter of each ring outward from the center.

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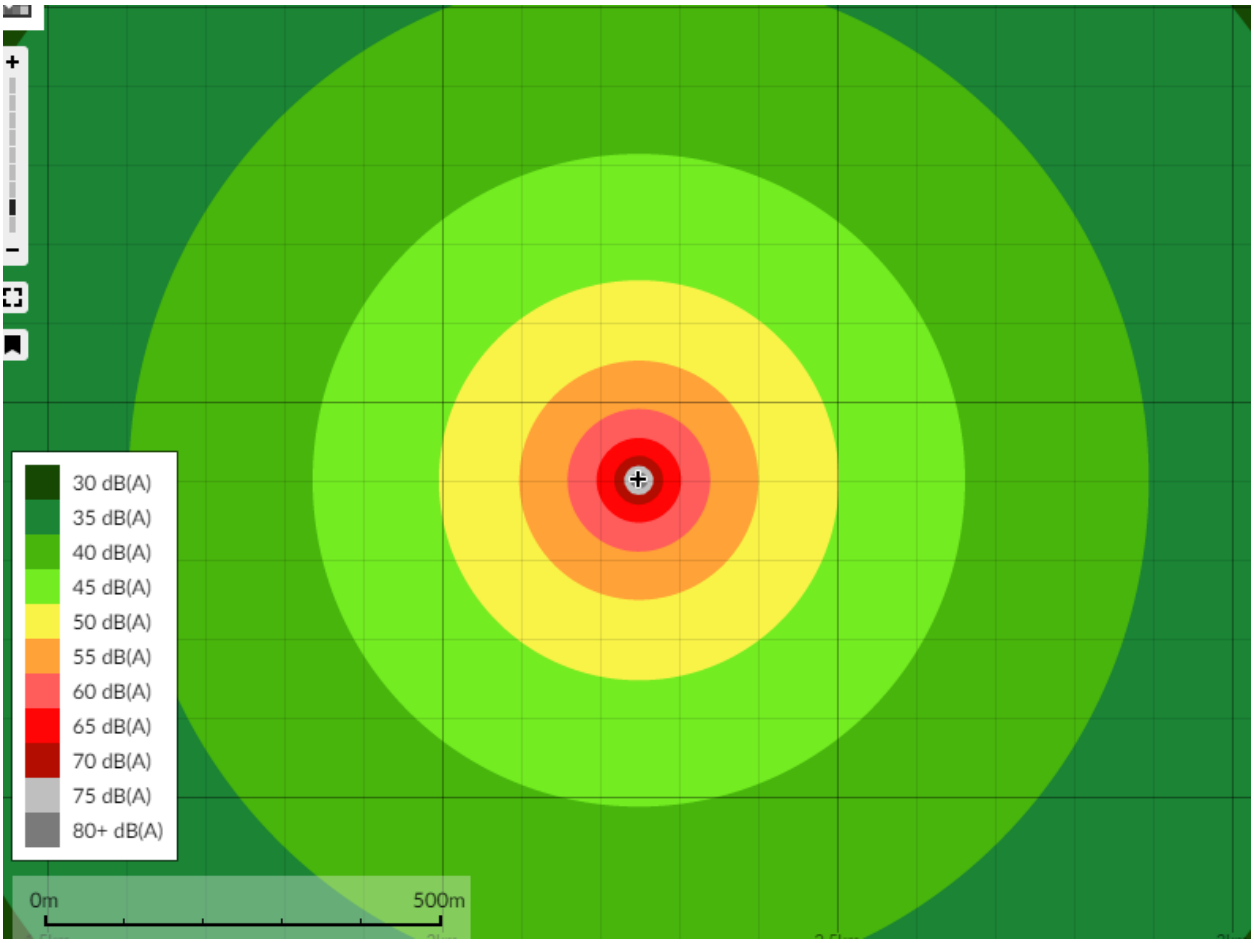

Figure 3 – Sound propagating away from a point source in a horizontal plane (1 meter= 3.3 feet)

Sound also propagates away from a source in the vertical direction. Figure 4 shows a three dimensional view of the vertical plane of sound propagation together with the horizontal plane. (The noise mapping software does not display distances in three dimensional plots.) The three dimensional behavior of sound becomes important to estimate the sound traveling up a hill, to a second story window, over a building, or to an apartment/condominium balcony.

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Figure 4 – Sound propagating away from a point source in a horizontal and vertical plane

Human Hearing and Annoyance

The human ear is sensitive to a sound's level, its frequency content, its duration, and its frequency of occurrence (2). All of these contribute to annoyance. The higher the sound level, the greater the annoyance becomes. The human ear is only sensitive enough to detect a change in sound level of 3 dB. Each 10 dB increase in sound level is perceived as a doubling in the sound level. In the same manner, each decrease of 10 dB is perceived as one half the loudness. A 20 dB increase is perceived as 4 times as loud. Similarly, a 20 dB decrease is perceived as 1/4 as loud.

Hearing is more sensitive to high frequency sounds than to low frequency sounds. Sound measurements made with an A weighting scale match the frequency sensitivity of the human ear. These are described as dBA levels.

Another factor in annoyance is the interval or space between sounds. Intermittent sounds or impulsive sounds are considered more annoying than a steady state sound of the same dB level. All these elements contribute to annoyance and are critical to the noise measurements in noise ordinances.

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While response to noise is subjective and varies among individuals, the following guideline can be used to rate annoyance to LAFmax levels from pickleball for a person of normal hearing sensitivity, regardless of distance from the noise.

- less than 50 dB LAFmax (green zones) – perceptible and acceptable
- 50 to 54.9 dB LAFmax (yellow zones) - marginally bothersome
- 55 to 59.9 dB LAFmax (orange zones) - bothersome
- 60 to 64.9 dB LAFmax (pink zones) – bothersome to annoying
- 65 to 69.9 dB LAFmax (red zones) - annoying
- greater than 70 dB LAFmax (dark red zones) – very annoying

To reduce the annoyance of any noise level, the distance between the source and receiver must be increased or noise control measures must be implemented.

Noise Ordinances

In simple terms, noise is sound that annoys. Community noise ordinances establish noise limits so that noise is neither annoying nor bothersome, even though it may be audible. These ordinances are not intended to establish a limit where sound is inaudible. They are intended to establish a limit where the presence of noise above a background noise level will not be objectionable. The background noise level is the result of wind, trees, birds, normal ambient sounds, and sometimes traffic. Noise ordinances use different noise metrics to quantify the time varying loudness of different types of noise.

Because continuous sounds and impulsive sounds have distinct characteristics that cause them to be perceived differently by human hearing, the noise limits for both types of sounds must be separately stated. This is because the ear responds differently to continuous and impulsive noises.

Austin, TX Noise Ordinance

Chapter 9-2 of the Code of the City of Austin, Texas has a limit of 75 dBA at a residential property line (5). Per item 9-2-1-3, a fast meter response is used for measurement and analysis as this is more applicable to measurement of pickleball impacts than a slow meter response. The ordinance has no added penalty for impulsive noise. A noise level of 75 dBA LAFmax would meet the noise code but would still be annoying to a homeowner. This ordinance does not have sufficient detail to quantify annoyance from pickleball noise.

Recommended PSM Consulting Standard for Pickleball Sound

PSM Consulting (PSMC) has used its experience with pickleball sound measurements to develop an improved standard for pickleball noise. The PSMC noise limit for pickleball noise is based on the background sound. Background sound should be measured using A-weighted equivalent sound level

(LAeq) or A-weighted slow response (LAS). These are both long term averages of sound fluctuations with an A-weighting. These measurements are commonly used for environmental studies of background sound. This PSMC standard sets an LAFmax level as a limit where pickleball sound would not be annoying.

The recommended noise limit at a property line for pickleball play to avoid annoyance follows.

- When the background sound level is at or below 47 dB LAeq, the limit for pickleball noise should be 50 dB LAFmax.
- When the background sound level is above 47 dB LAeq, the limit for pickleball noise should be 3 dB LAFmax above the background level.

These limits refer to noise levels at a property line. This location follows the standard practice for most community noise ordinances of setting limits at a property line. The noise levels at a pool, at a backyard patio, or at the house will be even lower due to the added distance from the property line.

If pickleball courts are in a quiet residential neighborhood with background sound at 47 LAeq, then a limit for pickleball noise at 50 dB LAFmax should be set. With the background sound level at 47 dB LAeq, pickleball impacts at 50 dB LAFmax will be faintly audible. For any lower levels of background sound, pickleball impacts may be perceptible but not bothersome due to the 50 dB LAFmax limit.

Pickleball sound at 50 dB LAFmax should not be bothersome to a person with normal hearing sensitivity for these reasons.

- 50 dB LAFmax is the noise level of a large, busy office.
- 50 dB LAFmax is not loud enough to be objectionable even due to its intermittent nature.

If pickleball courts are near a location with high background noise at 55 LAeq, then a limit for pickleball noise at 58 dB LAFmax (55+3) should be set.

This guideline provides a variable limit for pickleball noise at a property line depending on the background sound levels. Its use has been supported by successful applications at multiple pickleball sites. This standard for pickleball noise is recommended to avoid community or homeowner annoyance from pickleball play.

PSM has successfully applied these limits to several pickleball facilities and to homeowner associations concerned with pickleball noise. They have been used to judge annoyance at specific home locations with no mitigation in place and to confirm the performance of noise mitigation strategies.

The Pickle Ranch, Austin , TX

Figure 5a shows an aerial view from Google Earth of the pickleball courts at the Pickle Ranch (6) together with the nearest homes to the courts in the Old West Austin Neighborhood (OWAN). The topography for the area was taken from Google Earth and was included on the sound map. The area has a hilly terrain with the elevation rising to the north and to the northwest of the courts.

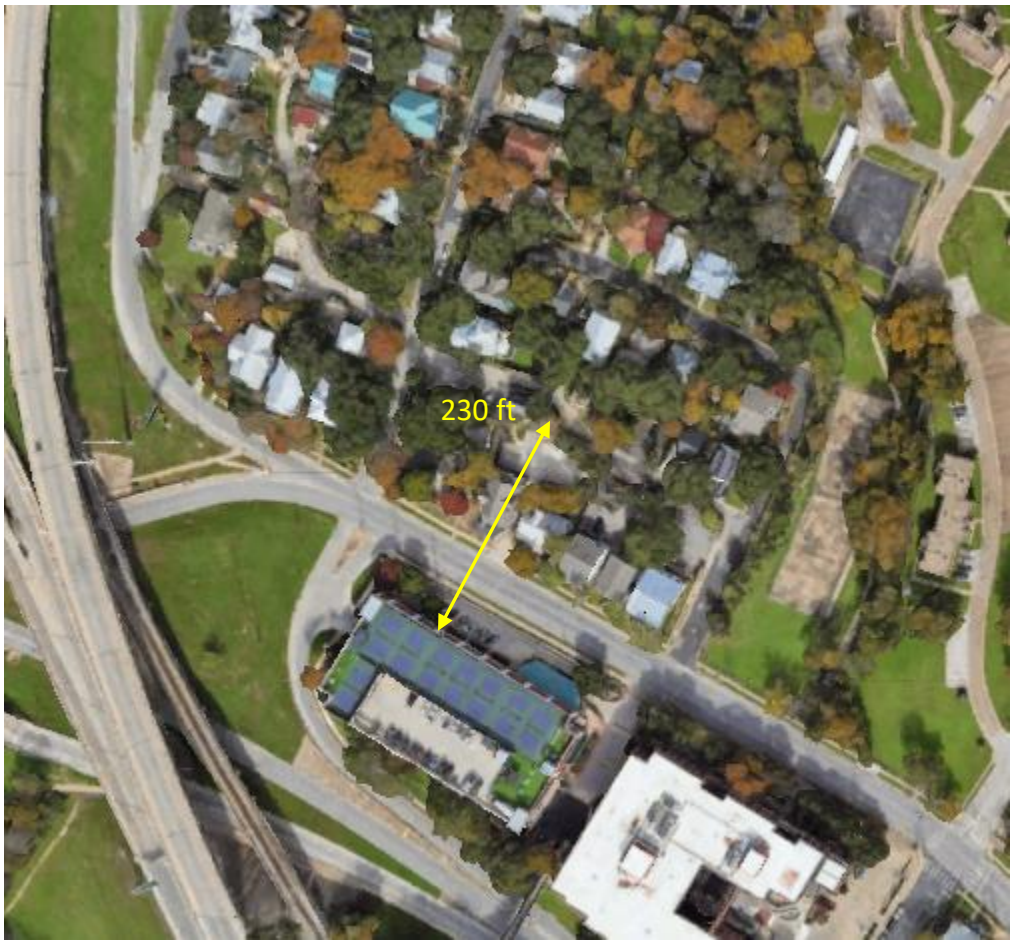

Figure 5a – Pickleball courts at Pickle Ranch and nearby homes in OWAN

Property lines for homes in OWAN were taken from real estate maps on Zillow.com. The closest property line to the pickleball courts is 1709 Francis Avenue, which is approximately 230 feet from the northeast pickleball fence. The dimensions of the homes and the roof heights for nearby homes were taken from Google Earth for inclusion in the noise map. Figure 5b shows a three dimensional view of the homes and the pickleball courts that were included in the model.

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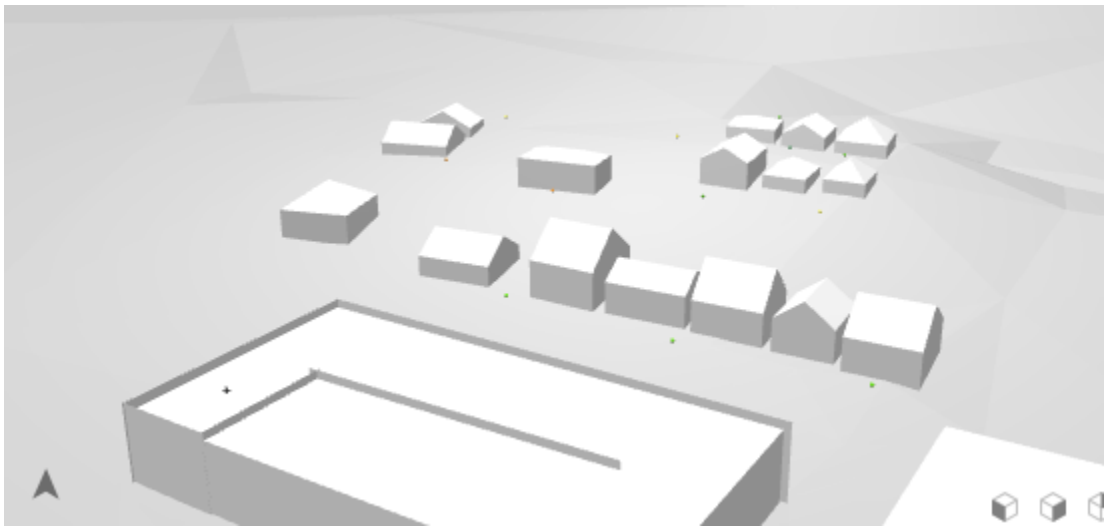

Figure 5b – Pickleball courts at Pickle Ranch and nearby homes in OWAN – three dimensional model

Figure 6 shows a cross section, a land contour, from the courts on West 6th Street to the homes on Francis Street. The courts on the fourth floor of the parking garage are at the level of the roof lines of the 1 and 2 story homes on Francis Avenue.

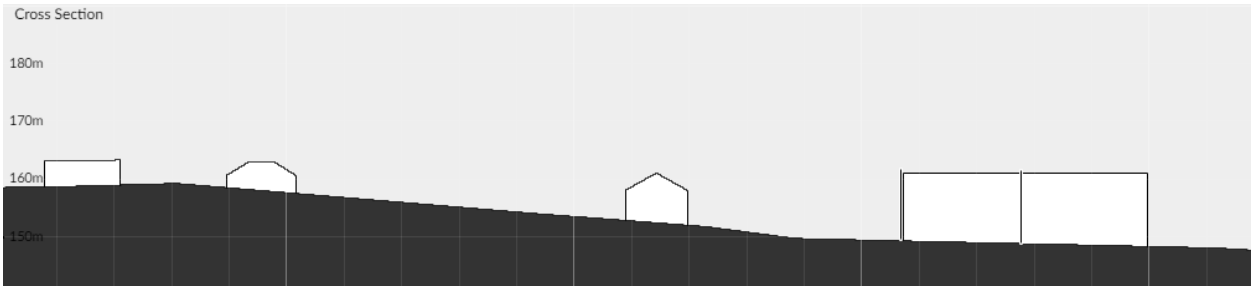

Figure 6 – Cross section of contour from West 6th Street to Francis Avenue

Per Figures 3 and 4, pickleball noise can come from any location on a pickleball court when a player strikes a ball. Pickleball noise travels away from the source in all directions. The loudest pickleball noises will occur in the primary direction of ball travel across the net. In addition, the positions of players change frequently during a game so that some shots (and the direction of sound) will continually change. The noise map will display noise levels in all directions away from the courts. Four court positions were selected on the rooftop to show the influence of line of sight noise propagation from these source positions into the neighborhood. These courts are numbered 1, 2, 3, and 4 in Figure 7. The noise analysis will show the relationship between the source location (the court) and distance to a receiver (a home) and the effect of homes that block sound traveling along a direct line of sight or a reflected path between a source and receiver.

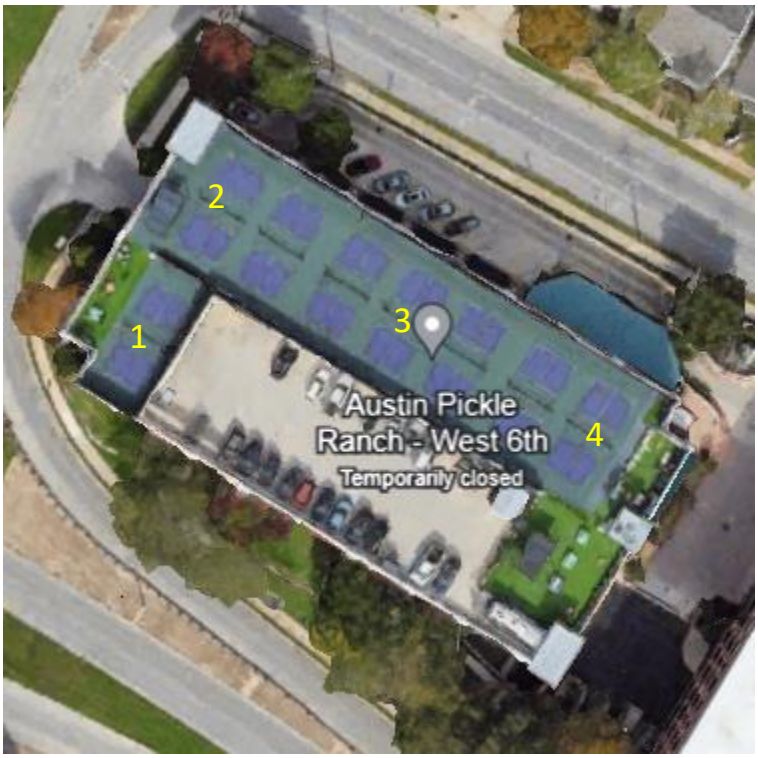

Figure 7 – Pickleball court numbers

The background noise level was assumed to be 47 dB LAeq which is typical of a residential neighborhood. The PSMC noise limit of 50 dB LAFmax was therefore used.

Figures 8a, 8b, 8c, and 8d show the noise levels at multiple locations in OWAN with pickleball play on courts 1, 2 3, and 4, respectively. The white circles indicate LAFmax levels in dB at each location at a height of 1.5 meters or 5 feet. This height is ear level for most people. Noise levels above 50 dB LAFmax occur at multiple locations and would be bothersome.

Figure 8a – Noise levels in OWAN from court 1

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Figure 8b – Noise levels in OWAN from court 2

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Figure 8c – Noise levels in OWAN from court 3

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Figure 8d – Noise levels in OWAN from court 4

Table 1 shows the noise levels at 6 property locations based on pickleball play from these four courts. The highest noise level at each property is indicated and the court that creates this highest noise level is listed. The highest noise level was 59 dB LAFmax at 1705 Francis Avenue. This was with pickleball play on court 3. This noise level is considered bothersome and borders on being annoying. Court 3 and then court 2 were selected as worst case scenarios for noise propagation to OWAN to evaluate noise mitigation strategies.

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Table 1 – Noise level summary

	LAFmax				Highest	Noise
Receiver	**court 1**	**court 2**	**court 3**	**court 4**	**LAFmax**	**Source**
606 Patterson Avenue - front yard	56	58	57	55	58	Ct 2
607 Patterson Avenue - side yard	55	58	57	42	58	Ct 2
1709 Francis Avenue - back yard	42	47	58	50	58	Ct 3
1705 Francis Avenue - back yard	54	56	59	46	59	Ct 3
1704 Francis Avenue - front yard	38	38	56	44	56	Ct 3
1702 Francis Avenue - front yard	41	41	56	45	56	Ct 3

Figures 9a and 9b show color noise maps for noise from court 3 and court 2, respectively, for the surrounding areas of OWAN. Any areas not in a green zone are above the target of 50 dB LAFmax. A dark green zone is better than a light green zone as dark green indicates an even lower noise level. This figure highlights several points about noise propagation to each home in OWAN.

- With no homes to block a direct line of sight to the courts, noise levels decrease with distance from the courts.
- Homes along West 6th Steet and throughout the neighborhood block sound traveling away from the courts.
- It is quieter on the side of the house away from the courts than on the side facing the courts.
- A shadow zone exists on the side of the house away from the courts – the house and the roof line function as sound blockers or barriers.
- Through this blocking effect, it is possible to have lower sound levels near the courts than farther from the courts that are in a direct line of sight.
- The space between houses “channels” sound deep into the neighborhood until it is blocked by another house. This is evident with yellow/orange bands of sound propagation between houses.
- Through this channeling effect, it is possible to have higher sound levels farther from the courts than near the courts - depending on the line of sight.

Figure 10 shows a cross section of noise levels through the noise source on court 3 and up the hill to Francis Avenue. The shadow zone effect of the roof lines is more clearly seen here.

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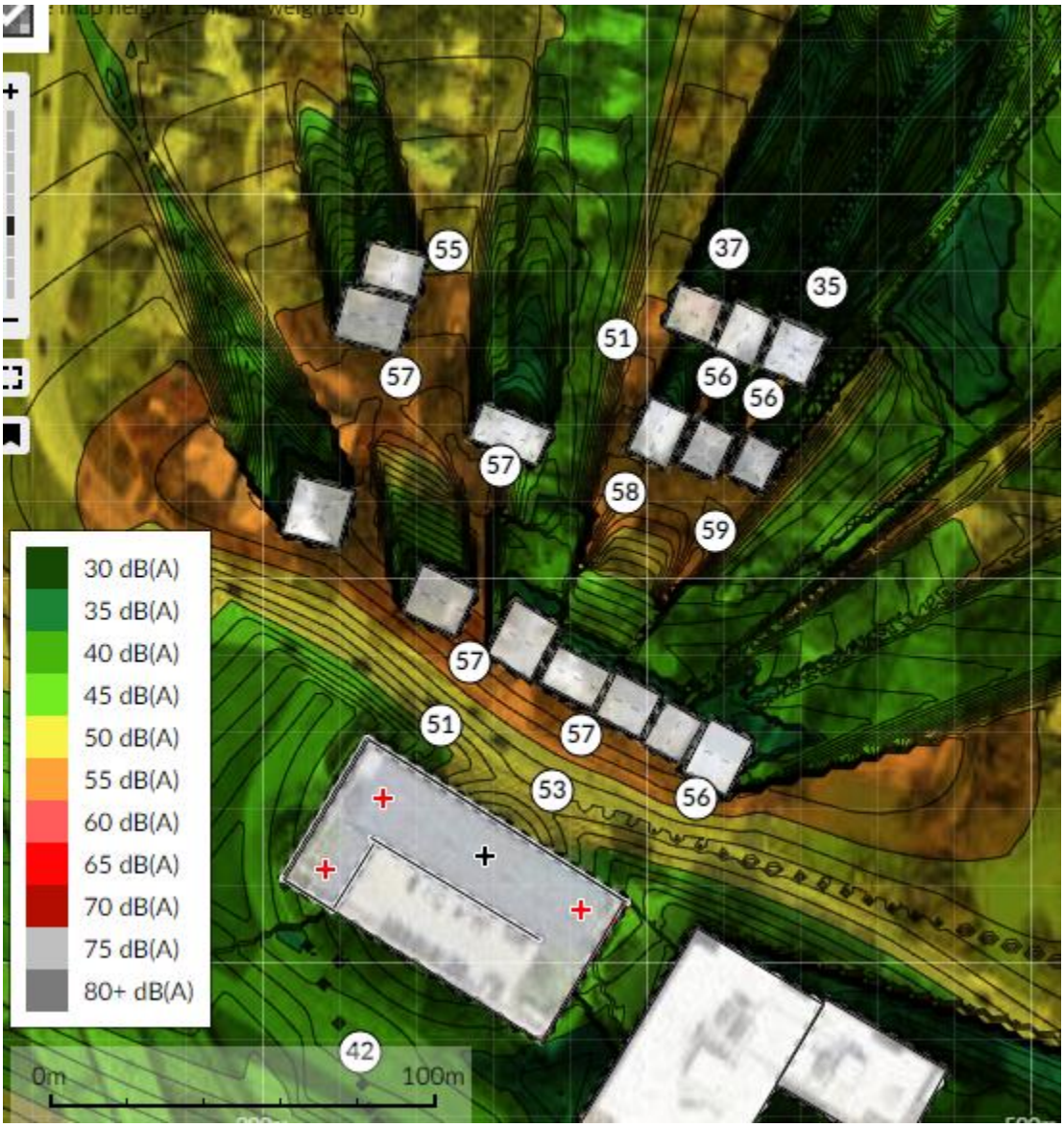

Figure 9a – Noise levels in OWAN from court 3

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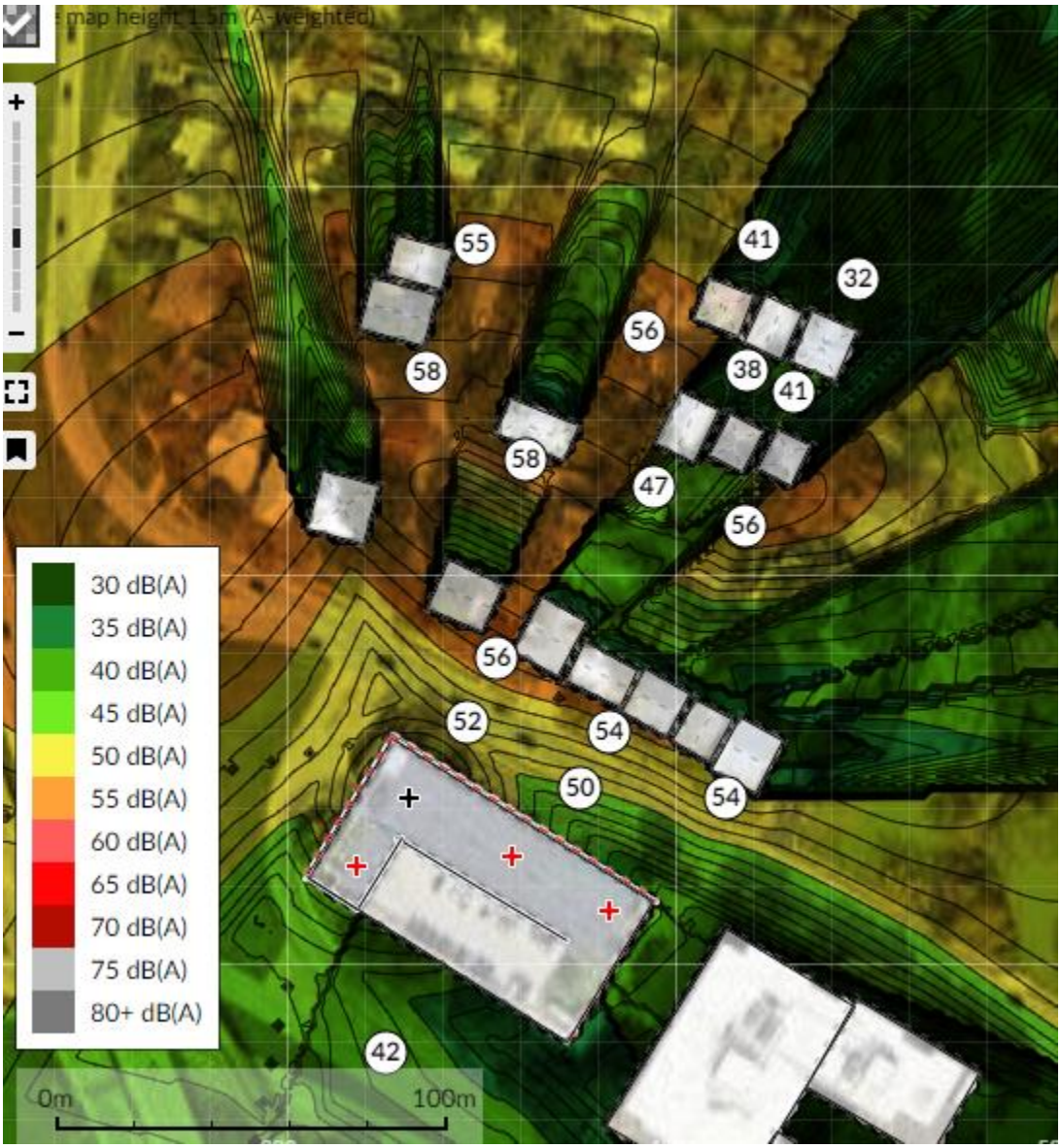

Figure 9b – Noise levels in OWAN from court 2

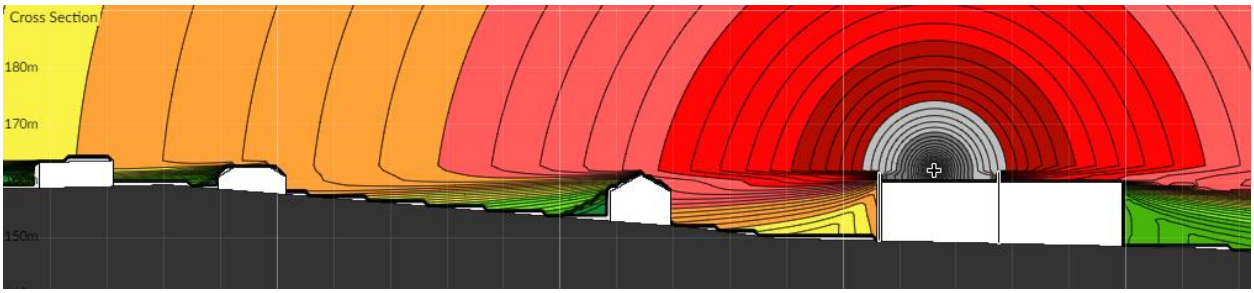

Figure 10 – Noise levels in OWAN from court 3 – cross section through noise source to northeast

Noise mitigation strategies were next evaluated to create green noise zones for homes in OWAN. The most effective noise mitigation option is a noise barrier to block sound. A noise barrier was placed on the northeast and northwest perimeter of the rooftop pickleball courts. (A description of sound barriers and suppliers is presented in Appendix A.)

The height of the barrier was evaluated at 6, 7, 8, and 10 feet. Only the 10 foot barrier was able to reduce the noise level to 50 dB LAFmax. This is because a 6 foot tall pickleball player with a 2 foot arm extension is striking an overhead smash at 8 feet above the court surface. This 10 foot barrier is more effective than a shorter barrier and is required for the greatest noise reduction. Figures 11a and 11b show that the 10 foot sound barrier reduced noise at the critical homes to 50 dBA LAFmax or below for play on courts 3 and 3, respectively.

Figure 11a – Noise levels in OWAN from court 3 with 10 foot sound barrier on northeast and northwest perimeter

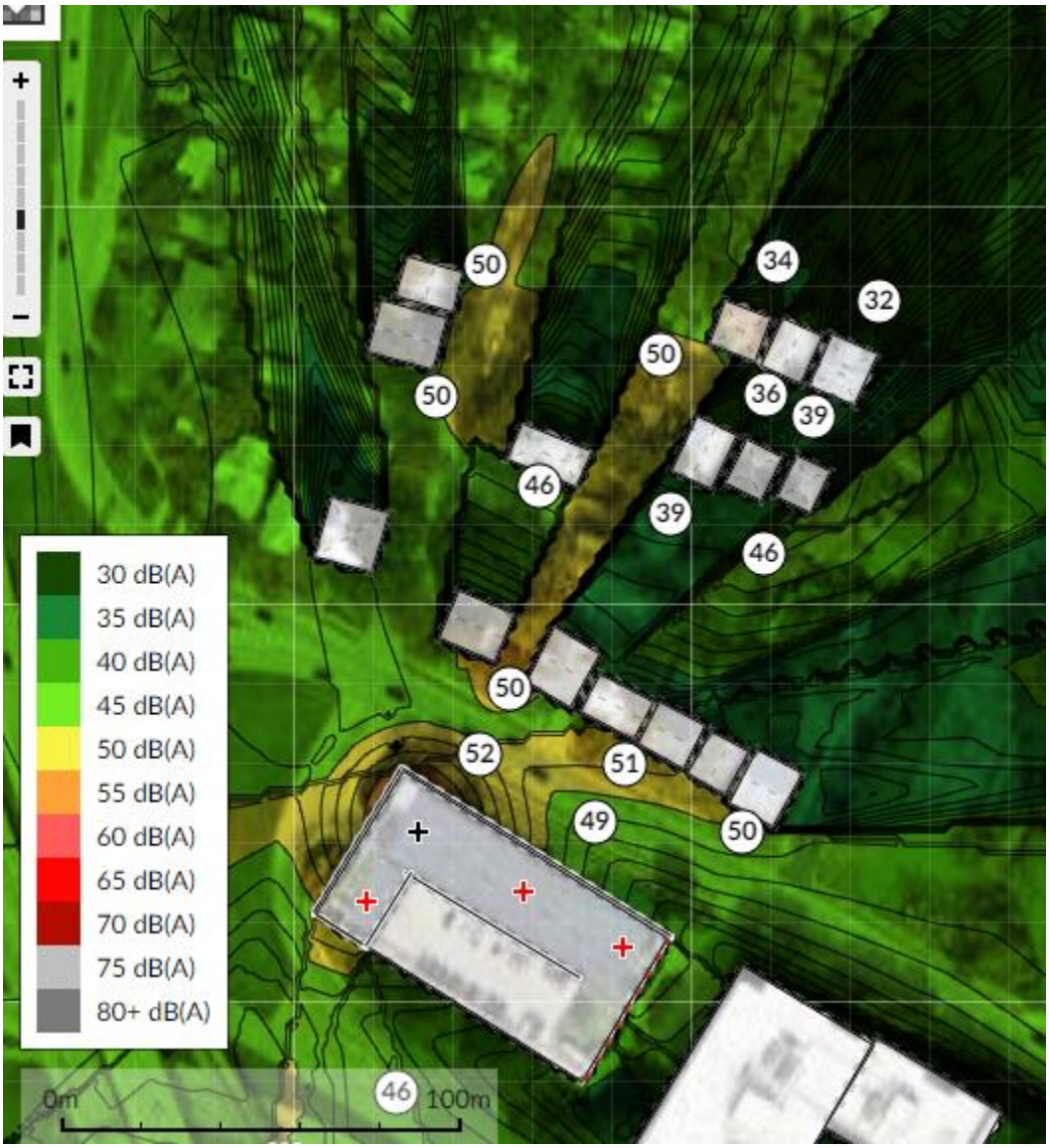

Figure 11b – Noise levels in OWAN from court 2 with 10 foot sound barrier on northeast and northwest perimeter

A color comparison between Figures 9a and 11a and between Figures 9b and 11 b shows the change in noise level (loudness) with the 10 foot barrier. Figures 11a and 11 b show more green zones. An expanded view of the noise maps showed that the yellow zones in both figures are 51 dB LAFmax and would not be different audibly to 50 dB LAFmax.

Table 2 shows the before and after noise levels at the 6 homes with the noise reduction provided by the 10 foot barrier for the 2 different courts. The noise reduction at these homes changes due to differences in the line of sight, the distances to homes, and the presence of homes that help to block sound. The noise reduction via the barriers was 6 to 13 dB LAFmax from court 3 and 2 to 12 dB LAFmax from court 2.

Table 2 – Noise level reduction with 10 foot sound barriers

	LAFmax from court 3			LAFmax from court 2		
Receiver	**Before**	**After**	**Reduction**	**Before**	**After**	**Reduction**
606 Patterson Avenue - front yard	57	50	7	58	50	8
607 Patterson Avenue - side yard	57	44	13	58	46	12
1709 Francis Avenue - back yard	58	47	11	47	39	8
1705 Francis Avenue - back yard	59	50	9	56	46	10
1704 Francis Avenue - front yard	56	50	6	38	36	2
1702 Francis Avenue - front yard	56	50	6	41	39	2

Compared to Figure 10, Figure 12 shows the cross section of sound propagation with the 10 foot barrier at the edge of the rooftop courts. This barrier blocks noise that previously would be at the rooftop level at Francis Avenue.

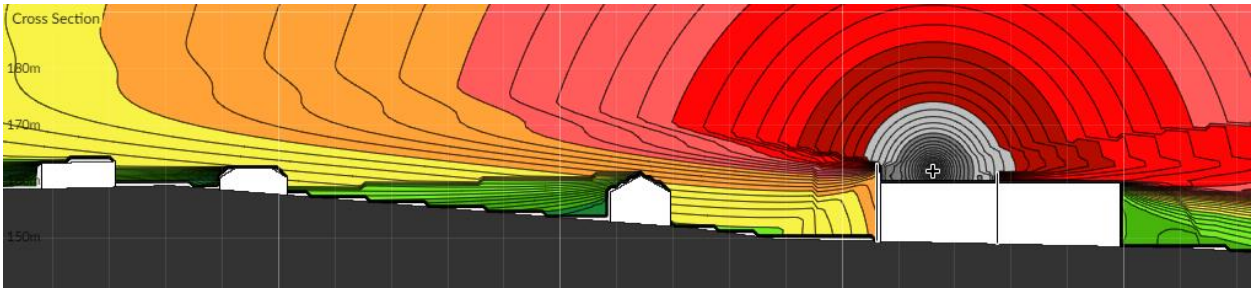

Figure 12 – Noise levels in OWAN from court 3 with 10 foot sound barrier – cross section to northeast

Figure 13 shows a three dimensional view of the courts and the homes in OWAN that were included in the sound map together with the noise levels from the sound map. The 10 foot barrier height on the northeast and northwest boundaries of the roof top courts is evident when compared to the roof line in Figure 5 b. The noise levels in the yellow zones are 51 dB LAFmax and would not be perceived differently than 50 dB LAFmax.

The sound level on the south side of the courts at ground level increased from 42 dB LAFmax to 46 dB LAFmax for play on courts 2 and 3. This shows that the barrier is redirecting noise away from the OWAN homes and to the south. With no homes to the south, this is a reasonable approach to noise mitigation.

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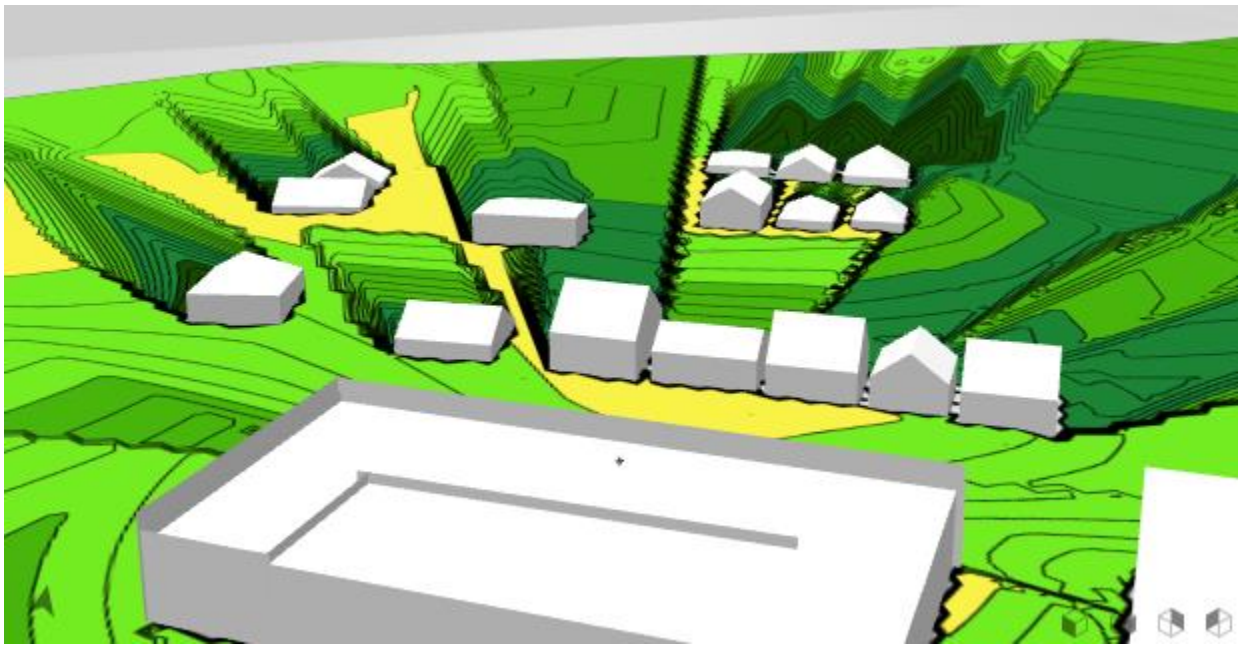

Figure 13 – Noise levels in OWAN from court 3 with 10 foot sound barrier – 3D view

This two-sided barrier design for pickleball noise mitigation offers several benefits to the residents of OWAN.

- The barrier is high enough to block sound at the rooftop level for the ground level of homes in OWAN that are at an elevation near the fourth story courts on West 6th Street.
- The barrier reduces noise to a level where it will not be bothersome to a person with normal hearing sensitivity.
- The barrier redirects sound to the south where there are no residential properties.
- Higher background sound than 47 dB LAeq from traffic to the west will further help mask the pickleball impacts.

This two-sided barrier design for pickleball noise mitigation offers several benefits to the pickleball courts at Pickle Ranch.

- The barrier provides a successful sound mitigation strategy that allows the courts to operate in a commercial area near a residential zone.
- The 2-sided barrier eliminates the higher cost of a 4-sided barrier enclosure.
- The 2-sided barrier avoids sound reflections from opposite barrier walls that can often be redirected back to the nearby homes. This can lead to more expensive options such as higher barrier walls or barriers with sound absorbing liners.
- The barrier design does not require higher priced sound barriers with sound absorbing liners on the court side.
- The 2-sided barrier allows an open court design for air circulation and for minimizing heat build-up on the courts.

Conclusions

The following conclusions are made from the results in this study.

1. The noise code of the City of Austin does not have sufficient detail to quantify the annoyance from pickleball. PSMC used a target of 50 dB LAFmax as a recommended noise limit.
2. Noise levels from rooftop pickleball from the Pickle Ranch are 59 dB to 56 dB LAFmax at property lines on Francis Avenue and Patterson Avenue. These levels would be considered bothersome and annoying.
3. These noise levels will be present with play on any of the 8 courts in use at the Pickle Ranch.
4. A 10 foot sound barrier on the northeast and northwest sides of the rooftop pickleball courts reduced noise to acceptable levels for homes in OWAN.
5. The noise reduction with this barrier ranged from 2 dB to 13 dB LAFmax depending on the court in use and on the distance and direction of the home from the courts.

Recommendations

The following recommendations are made for the noise reduction from pickleball play at Pickle Ranch.

1. For the noise from pickleball play to be acceptable to the residents of OWAN, a 10 foot sound barrier is needed on the northeast and northwest perimeter of the rooftop courts.
2. The barrier should be 1 pound per square foot or greater to reduce pickleball noise. It does not need a more expensive sound absorbing liner on the court side.
3. The color and design of the barrier should be compatible with the architectural requirements of the surrounding area.

PSM LLC has provided these recommendations on reductions of pickleball noise at Pickle Ranch to balance the growth and popularity of pickleball with required noise level reduction for nearby residents of OWAN. The goal is to address quality of life for the residents living near the pickleball courts. PSMC LLC is available to answer any questions related to this work.

Disclaimer

The results, conclusions, and recommendations presented here are based on information provided to PSMC LLC by the client and on measurements made using calibrated equipment and standard acoustical practices. These results are intended to address maximum noise levels from play. Pickleball sound assessment is a random process where the noise from each impact and from each game can vary based on player skill, force of impact, and equipment in use. Sound levels from pickleball are random impulsive events, meaning that it is predictable over a range and has averages and other statistical characteristics, but it has no exact single level. Actual sound levels will vary over time. In addition, it is not possible to determine what any particular person believes is an acceptable sound level. Because additional variables may be associated with the site, the players, or the equipment in use, PSMC LLC assumes no liability for work undertaken by the client based on these recommendations, or for results that do not conform to the client's expectations.

Barry R Wyerman, PhD, PE
Principal Acoustical Consultant
PSM Consulting LLC

Rev 1 – September 7, 2024
Recommendation number 3 - Removed PSM Consulting's mention of specific colors for a sound barrier to allow the barrier to be of any color or design compatible with the architectural requirements of the surrounding area.

Reference Sources

1. ANSI S1.4 Specification for Sound Level Meters
2. Handbook of Acoustics, Everest, F, Alton and Pohlmann, Ken C., fifth edition, 1979.
3. ANSI S12.9 Quantities and Procedures for Description and Measurement of Environmental Sound
4. https://noisetools.net/dbmap/ - Noise Mapping Tool
5. Noise code of the City of Austin, Texas https://library.municode.com/tx/austin/codes/code_of_ordinances?nodeId=TIT9PRAC_CH9-2NOAMSO
6. Austin, Texas, West 6th Street - Google Earth https://earth.google.com/web/@30.27633413,-97.76498553,150.16854646a,634.9930276d,35y,0.00019926h,0t,0r/data=OgMKATA

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PSMC LLC Information

PSM Consulting LLC

PSMC LLC was created in 2022 after 8 years of pickleball noise studies and advice on pickleball noise mitigation. This work included field measurements of pickleball play at multiple sites, analysis of the noise from different pickleball paddles and balls, consultation with USA Pickleball on equipment standards, and evaluation of suppliers of noise barrier systems. PSMC has designed successful noise reduction systems for pickleball courts and has evaluated multiple paddles and balls to create lists of "quieter" paddles and balls. It has also completed field studies of pickleball noise to provide guidance to homeowners regarding local noise ordinances. In total, PSMC has completed or has been involved in noise surveys and recommended noise mitigations measures for 100 pickleball sites. PSMC is at the forefront of pickleball technology and is working directly with USA Pickleball to develop acoustical test methods for paddles, to identify quieter gear, and to create improved community standards for pickleball noise. It is also working with paddle manufacturers to help bring improved, quieter paddles to the market. PSMC LLC has developed the industry's first anechoic chamber for testing both pickleball paddles and balls under controlled speed conditions. This provides baseline data on paddles without the variables of background noise and player skill in hitting the ball.

The mission of PSMC is to support pickleball clubs, pickleball players, communities, parks and recreation departments, country clubs, and homeowner associations with an understanding of pickleball noise and of strategies and measures to control pickleball noise.

Barry Wyerman, PhD, PE

Barry Wyerman, PhD, is the Principal Acoustical Consultant for PSMC LLC. He is a pickleball player and a USA Pickleball Level 2 Referee. His professional background includes over 45 years of acoustical experience in creating innovative acoustical products, solving industrial noise control and vibration problems, and designing solutions for automotive noise and vibration control. He is the owner of Acoustical Design and Consulting, LLC, which provides engineering and consulting support in all areas of acoustics and noise control. He has a BS degree in physics from Ohio University and MS and PhD degrees in engineering acoustics from Penn State University. He became involved in pickleball noise mitigation when he provided initial recommendations on pickleball noise control from his work experience and acoustical training. His professional associations include:

- The Acoustical Society of America
- Society of Automotive Engineers, Noise and Vibration Committee
- Society of Automotive Engineers, Acoustical Materials Committee
- Professional Engineer, registered in Ohio

Appendix A - Sound Barriers

Sound barriers block the direct path of sound as it travels from a source to a receiver. A barrier must be massive enough to block sound that could pass through it. The recommended weight for a barrier is one pound per square foot. A small amount of sound still passes over the top or around the edges of a barrier. This is called diffracted sound. With this weight barrier, the sound reduction is limited only by the height and width of the barrier.

The barrier must be solid with no holes, no gaps at the bottom, and no gaps between adjoining panels. Any holes or openings will allow sound to leak to the other side. Earth mounds and buildings can function as barriers if they are high enough and wide enough to disrupt a direct path of sound.

Shrubs, bushes, and trees are NOT barriers even though they block a line of sight. They are not massive enough and not solid enough to block sound. A small amount of sound attenuation may be achieved with a dense planting of hedges, but this would not provide more than 1 dB sound reduction even if the hedges were 3 or 4 feet in depth and 12 feet high. These are primarily a visual barrier.

The effectiveness of a high mass barrier is controlled primarily by its height and then by its width. The barrier must be tall enough and wide enough so that it minimizes the sound that is diffracted or bent over the top and around the edge. The amount of sound diffracted over the top and around the edge can be minimized as the barrier becomes higher and longer. As the height of a sound barrier increases, a point of diminishing returns is reached. This means that a percentage increase in height (and cost) will result in a lower percentage improvement (or return on benefits) in noise reduction. In some cases, it may be best to enclose all four sides of a pickleball court with the highest barrier possible. If there are no homes exposed to pickleball sound from a side of the court, then a barrier can be eliminated on that side.

Common vendors for sound barriers are:

- Acoustiblok, Tampa, FL, 813-980-1400, https://acoustiblok.com/acoustiblok-soundproofing-product-lines/acoustifence-noise-reducing-fences/ (printed barriers)
- Insul-Quilts USA, South El Monte, CA, 833-853-6444, https://www.insulquilt.com/
- eNoise Control, Noblesville, IN, 866-481-2024, https://www.enoisecontrol.com/
- DDS Acoustical Specialties, Westfield, MA 413-248-8118, https://ddsacoustical.com/
- Hushtec USA, Connecticut, 860-289-8033, https://hushtecusa.com/ (clear barriers)
- Putterman Athletics LLC, DeLand, FL, 800-621-0146, https://www.puttermanathletics.com/
- FenceScreen, Grand Prairie, TX, 888-313-6613, https://www.fencescreen.com/

All barriers of the same weight would perform the same. None of these products are noticeably different other than by the color or by printing. Any differences in product sheets can be due to lab differences in testing. Noise barriers should weigh one pound per square foot to block any sound that could pass through the barrier. The effectiveness of this high weight barrier can still be compromised by the sound that is

diffracted over the top or around an edge. A contractor must be consulted to assure that an existing fence or a new fence can support the added weight of a barrier. Wind loads on the barrier are also to be considered.

Some barriers are available with a sound absorbing lining material on the side facing the noise source – if this is needed. This sound absorbing lining can reduce the noise level on the court by reducing the reflected sound as it bounces between the side walls. It can also be effective in reducing reflected sound in the opposite direction away from a barrier if only one side of a court has a barrier. However, the sound absorbing lining has no impact on the sound passing over the top of the barrier. This direct path of sound is not influenced by anything on the side walls. The sound absorbing liner is more for noise reduction for the players than for any nearby residents exposed to sound.

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Google
ILLEGAL RIGHT TURN

Email from Barbara Koonce

To: Jonathan Tomko

9/9/24 5:34pm

September 8, 2024

RE: C814-82-006.02(83) - Lake Austin Commons PUD Amendment - 1717 West 6th Street - Agenda Item 8

Dear Chair Hempel and Planning Commissioners,

The Old West Austin Neighborhood Association, OWANA, opposes the 1717 W 6th Street PUD Amendment changing a condition of zoning. This is not just a rezoning case to get more height, additional uses or increased FAR. It is also about rectifying a use blatantly non-compliant with current zoning.

Last fall Aquila, the building owner, and Austin Pickle Ranch, a tenant, constructed eight new pickleball courts on the top level of the existing parking garage. In addition to the courts, five new pole floodlights were installed on the north perimeter adjacent to W 6th Street and the existing security light poles were changed out to include one flood light per pole. These courts are an illegal use under the current PUD and the improvements were constructed without a building permit.

This new business began operating October 1st, 2023 seven days a week from 8 a.m. to 10 p.m. Within a few weeks the neighbors began to be concerned about the noise and lights and contacted Aquila to set up a meeting with Austin Pickle Ranch. The nearby neighbors advised that the noise and light from pickleball was becoming a nuisance. For weeks after the meeting, no remediation effort was noticed by the neighbors. Amplified sound was coming from the court area and every night the lights were left on until sunrise. Another meeting in mid-November between the parties resulted in an agreement to get back in touch with the neighbors in 45 days. But after 45 days, there was no response. The lights, amplified sound and the repetitive impulsive sound frequency of the pickleball volleys created a distressing environmental condition and disrupted the quality of life of the immediate neighbors.

In January, Aquila requested a meeting with OWANA's zoning committee. We met on February 1st and were told that Aquila would be filing an amendment to their PUD and wanted to notify us and discuss the issues the neighbors were having with pickleball and try to rectify the situation. We were told lights would be turned off at 10:15, light shields would be ordered, mitigation equipment would be considered and a sound study would be done. By the end of February, the perimeter lights were off by 10:15 p.m. but the court lights on the security light poles remained on until the end of April and still no light shields had been installed. The neighbors invited Aquila to see with their own eyes the effect of the lights and noise ***in*** their homes. Aquila never showed up.

OWANA suggested changing equipment – using quiet rackets and different balls to reduce the noise, but the building ownership could not encourage their tenant to comply. Continuing frustration on the part of the neighbors led them and OWANA to place a complaint by call to 311 on April 25th. Several neighbors and an OWANA representative then met with Council Member Zo on May 7th to discuss the matter. He was helpful in getting the attention of the Code Compliance department for investigation of the complaint. On May 10th a Code Compliance officer met with the tenant business owner on site and issued a citation to cease the prohibited use until proper zoning and permitting could been obtained. There was no cessation, instead play continued on the courts.
On May 30th the Austin Pickle Ranch presented a sound study to OWANA and the neighbors with recommendations, updated paddle rules, and what they styled as their final attempt to mitigate noise and lighting issues. The basic vibe of the delivery was that Austin Pickle Ranch was trying to promote health and happiness and that pickleball was not a

problem – **the neighbors are**. Play continued on the courts until the building owners finally locked them out of the space and had them close the premises on June 7th without ever installing the lighting shields.

The Pickle Ranch sound study did not use industry standard methods for measuring sound, pitch, etc. that are specific to the sport. This led OWANA to hire PSM (Pickleball Sound Mitigation) Consulting, a nationally recognized pickleball sound mitigation consultant. See attached report recently received by OWANA. On another attempt to reach a compromise last week we suggested the consultant's recommendation to add a 10 foot tall acoustic barrier having a weight of one pound per square foot or greater that would provide a sufficient acoustic remediation to bring the noise down to a reasonable level for the neighbors. Aquila has indicated they are unwilling to commit to the compromise. OWANA is running out of patience with the applicant's response to its requests and has unfortunately spent an inordinate amount of time and money discussing and addressing pickleball noise and lighting remediation for a clearly illegal use. OWANA does not own this problem; Aquila and the Pickle Ranch own this responsibility.

Other aspects of the proposed PUD amendment that concerns the neighborhood are as follows.

1. The added authorization for use by a cocktail lounge in the parking garage.
2. There has been a lack of focus on the hazardous traffic conditions caused by the current illegal use. Since Pickleball Ranch opened, there has been an increase in cars exiting the Hartland Plaza parking garage taking an illegal right turn to access W. 6th Street. Neighbors exiting Patterson St. onto W. 6th Street have been run off the road. (See attached diagram). This is a major traffic hazard.
3. There has been an uptick of pickleball players parking in the neighborhood because they are not wanting to pay the $5 parking garage fee.
4. The lack of proper fencing is a safety concern for players and for stopping balls from flying over the parapet wall.
5. Aquila is requesting authority to double the height of the building without providing any plans or ideas of how this will work both in terms of massing, traffic and pedestrian experience and compatibility with existing uses. If the developer is willing to commit to a percentage of affordable housing, then OWANA would be more inclined to accept a height increase. However, Aquila mentioned that is unlikely they will add residential for 20 years.

It is the City's and the Planning Commission's responsibility to study the effects of zoning and use changes and their consequences. We are unable to reach an agreement for the reason that Aquila is unwilling to adequately address the problem they created. This PUD amendment is asking for considerable discretionary development authority without stating clear intentions for usage. And the timing of the development is uncertain, because the Austin Pickle Ranch was given a seven year lease, for its illegal use.

For these reasons, after repeated efforts to reach a compromise, we oppose this zoning change. We ask you to validate our position by opposing this application. Denial of the application would send a message to developers and owners that the city will not give in to projects without permits and compliance and later be excused by approving a zoning change to make them compliant without addressing the neighborhood's reasonable requests. In other words, in this case, it is not appropriate to ask forgiveness afterwards instead of permission beforehand.

Sincerely,

Christopher Hurst, AIA
OWANA Chair

PSM CONSULTING LLC
Pickleball Sound Mitigation

Analysis of Pickleball Noise from Pickle Ranch, West 6th Street Austin, TX – Revision 1

by

PSM Consulting LLC

September 7, 2024

PSM Consulting LLC
Bonita Springs, Florida
wyerbr@sbcglobal.net, 248 563 0867

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Executive Summary

PSM Consulting LLC (PSMC) used noise modeling software to create sound maps for pickleball noise from the rooftop pickleball courts at Pickle Ranch, West 6th Street, Austin, Texas. Noise levels were estimated at multiple locations in the nearby Old West Austin Neighborhood (OWAN) with particular attention to homes on Francis Avenue and Patterson Avenue. These homes are on a hill at an elevation near the elevation of the rooftop courts. Next, sound barriers of several heights were positioned around the pickleball courts and noise levels were estimated until acceptable sound levels were achieved in the OWAN.

The noise code of the City of Austin has a limit of 75 dBA at a residential property line. This limit has no penalty for impulsive noise and allows impulsive pickleball noise at 75 dBA. This level would be considered very annoying. The city noise code does not properly address noise from pickleball. A noise limit of 50 dB LAFmax that has been successfully used by PSMC to address pickleball noise at pickleball sites was therefore used for this site.

The noise levels from pickleball were 59 dB LAFmax at the property line at 1705 Francis Avenue, which is the closest property line to the Pickle Ranch courts. This noise level would be considered bothersome to residents of this home. Multiple locations were identified with noise levels of 56 dB to 59 dB LAFmax, which are also bothersome. The height and the close spacing of homes on West 6th Street and the close spacing of the homes throughout the neighborhood prevent these sounds from being even louder.

When a 10 foot sound barrier was added on the northeast and northwest sides of the courts, the noise levels were reduced to acceptable levels of 50 dB LAFmax or below. Noise levels at homes farther from the courts are even lower since the homes and the roof lines within the neighborhood function as barriers to block sound.

The two-sided barrier blocks sound to the homes in OWAN that are north of the pickleball courts. The barrier redirects sound to the south where there are no homes. Suppliers of sound barriers are provided with barriers available in color or with printed surfaces to match the architectural requirements of the neighborhood.

Introduction

Pickleball is a game played with two to four players using paddles, a ball, and a net on a court that is approximately one half the length and one half the width of a tennis court. The paddles are made of wood, plastic, or composite materials, and the ball is made of plastic. Each paddle and ball impact during a game creates a short pulse of sound that varies in intensity, duration, and frequency content. For homeowners near pickleball courts, pickleball sounds can become bothersome and intrusive, depending on the distance from the courts and the sound mitigation in place. This annoyance is also because the frequency of a paddle and ball impact is near 1000 Hz, which aligns with the maximum sensitivity of human hearing.

To help explain the details in this sound study, background information is provided on pickleball sound impulses, sound measurements, human hearing, noise ordinances, noise limits, and sound mitigation options.

Pickleball sound levels are presented at several locations in the nearby Old West Austin Neighborhood on a hill that is north of the Pickle Ranch courts. These Pickle Ranch courts are on the fourth floor of the parking garage on West 6th Street and at the same elevation as some of the homes on the hill.

The Sounds of Pickleball

A typical pickleball game will produce a series of random paddle and ball impacts each time the ball is struck. These impacts are described as “popping sounds of varying loudness.” The loudness of each impact varies based on a player’s position on a court, the paddles and balls being used, the skill level of each player, and the force of each impact. Higher skill players will generate louder noise from pickleball via their forceful paddle strikes than lower skill players.

A paddle/ball impact is an impulsive sound with a duration of 10 to 20 milliseconds. The maximum loudness occurs in the first 5 milliseconds. Impulsive sounds are defined as sounds lasting less than one second with an abrupt onset and abrupt decay (1). The highest sound energy occurs in the first 5 milliseconds and then decays to a lower level. The peak acoustical energy is near 1000 Hz, which corresponds with the most sensitive region of human hearing.

In a game of pickleball, a rally will generate several random impacts until the rally is over. A game involves several rallies (and impacts) until a team wins. A typical pickleball game will generate 12 to 15 impacts per minute or 720 to 900 impacts per hour. If multiple courts are in use at the same time, then the number of impacts per hour will be increased by the number of courts. However, not all impacts are of the same loudness. Soft paddle strikes will be barely audible and forceful paddle strikes will be much louder. In addition, the probability of any two paddle strikes occurring at the same time is extremely low. This is because the loudest sound of any one impact lasts only 5 milliseconds or 1/200th of a second. More than 200 courts would have to be in use for two impacts to overlap and increase the loudness of a single impact.

The resulting noise with more courts in use is therefore more pickleball impacts in any period of play and potentially greater annoyance, but not greater loudness.

The goal in noise mitigation is to reduce the loudest impacts to a low enough level so that the loudest impact will not be bothersome. If the loudest impacts are not bothersome, then lower loudness impacts will not be a problem.

To be effective, a noise study must consider the highest noise levels rather than an average noise level. This has been taken into consideration for this noise analysis by considering the loudest noise levels during play.

Measurement of Pickleball Sound

Sound is measured with a sound level meter as shown in Figure 1. The units of sound measurement are decibels, abbreviated as dB. Higher dB levels represent louder sounds.

Figure 1 - Sound Level Meter

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Reference dB levels for common sounds follow.

- 120 dB – ambulance sirens, jet planes at takeoff
- 110 dB - car horns
- 100 dB – factory machinery
- 90 dB – lawnmowers, blenders, power tools
- 80 dB – truck traffic, alarm clocks, garbage disposals
- 70 dB – washing machines, hairdryers, highway noise, city streets
- 60 dB – dishwashing machines, electric toothbrushes
- 50 dB – moderate rainfall, large offices
- 40 dB – refrigerators, quiet offices, quiet residential area
- 30 dB – library, a whisper

These sound levels are what would be heard at approximately 3 feet distance between the source and the listener.

The human ear does not hear all sounds equally. It has more sensitivity in a mid-frequency range of 1000 to 4000 Hz and has diminished sensitivity at frequencies above and below this range. A frequency weighting can be applied to any sound measurement to match the hearing sensitivity of the human ear. This is called the A-weighting. Decibel measurements with the A-weighting are listed as dBA.

Because sound is not constant and varies with time, the sound level meter has several measurement settings to average these sound fluctuations over the measurement period (1). These settings report the sound level for the measurement period selected. The meter setting must be properly selected to capture the sound level based on the duration of the sound and the response time of the human ear.

What meter setting is best for pickleball play? For short duration sounds like pickleball impacts, the fast meter response with an A weighting best corresponds to the averaging time and sensitivity of the human ear (2). A maximum hold setting can also be used. The maximum hold setting “listens” for the maximum sound level within the measurement time interval and continues to update the maximum level. In this manner, the maximum level of these rapid fluctuations can be captured over the measurement period.

The fast meter setting will always measure a higher sound level for a pickleball impact than a slow setting. The slow meter setting averages sound over a longer averaging period that includes intervals with no pickleball impacts. The slow setting is appropriate for continuous noise and for background noise but is not appropriate for pickleball impacts. The slow setting understates the loudness of the short duration pickleball impact heard by the human ear. Different time averaging intervals will therefore report different dB levels for the same sound event.

When the A-weighting setting on a sound level meter is selected, dB measurements are described as dBA. If the sound level (L) is measured with an A-weighting (A) and a fast (F) setting, it is described as LAF. When the maximum level is captured in the measurement interval, this is called LAFmax. Unless otherwise noted, pickleball sounds in this report will be described in units of LAFmax. LAFmax measures the maximum sound, regardless of the number of impacts. If the LAFmax sound level can be reduced through sound mitigation to a low enough level to not be bothersome or not be heard, then the number of impacts (or the number of courts in use) will not be important.

The LAFmax is the preferred metric over LAeq, which is the continuous equivalent-energy level (3). The LAeq is the level of a continuous noise having the same sound energy as a given time-varying noise. For an impulsive noise that is only present for a short period of time, the time averaged LAeq dB level will understate annoyance. For pickleball, the LAeq will be lower than the LAFmax level for the short duration pickleball noise impulse.

LAFmax addresses the maximum sound, regardless of the duration. If the LAFmax is reduced to a low enough level to not be bothersome, then the number of non-bothersome pickleball impacts will not be an issue. The maximum value of the LAFmax noise level to avoid annoyance from pickleball has been determined by PSMC from site evaluations and from human response and is described in a later section.

Noise Maps

Noise maps were created using the dBmap.net Noise Mapping Tool, which is a commercial software (4). The topography of the surrounding area was applied to the noise map before the positions for a noise source and for receivers were selected. Ground elevations were selected from Google Earth. In addition, buildings and homes were added in the vicinity of the pickleball courts. The size of each building together with the roof height were selected from Google Earth and applied to the model for the site. The pickleball noise source was then placed on the court, and the receiver locations were selected. Because this is a European software, all distances, site elevations, building sizes, and barrier heights must be added to the model in meters. The resulting noise maps with distance scales can only be shown in meters. (One meter = 3.3 feet)

All colored noise maps have the legend shown in Figure 2. Each colored band represents a 5 dB change in sound level. The number beside each band indicates the lowest sound level within the band. In addition, sound maps shown in color have white lines within each band of colors to show the 1 dB changes within this 5 dB interval.

For example, the yellow band indicates noise levels from 50 dBA to 54.9 dBA; the orange band indicates noise levels from 55 dBA to 59.9 dBA; and the pink band indicates noise levels from 60 dBA to 64.9 dBA The colors represent increasing sound levels from 30 dBA in dark green to over 80 dBA in dark grey.

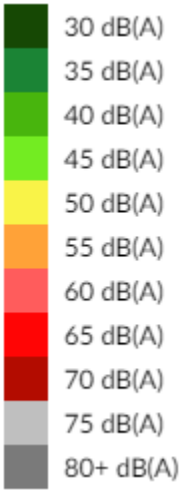

Figure 2 – Color legend for noise maps

All noise maps are shown with north oriented to the top of each map. This provides a link to any local maps which also have north oriented to the top of the map.

Sound Propagation

Sound travels away from its source with a reduction of 6 dB for each doubling of distance from the source. This means that sound decreases in loudness as the distance from the sound source increases. Figure 3 shows sound propagating away from a point source over level ground using the noise modeling software (4). This figure shows the horizontal plane of sound propagation. Each colored ring represents a 5 dB decrease of sound as indicated by the legend. Sound decreases in level as either a listener moves away from a sound source or as the sound source is moved farther away from a stationary listener. (Distances in noise plots can only be shown in meters because the software used is a European software which only displays meters. One meter = 3.3 feet) The 6 dB reduction for every doubling of distance is evident with the increasing diameter of each ring outward from the center.

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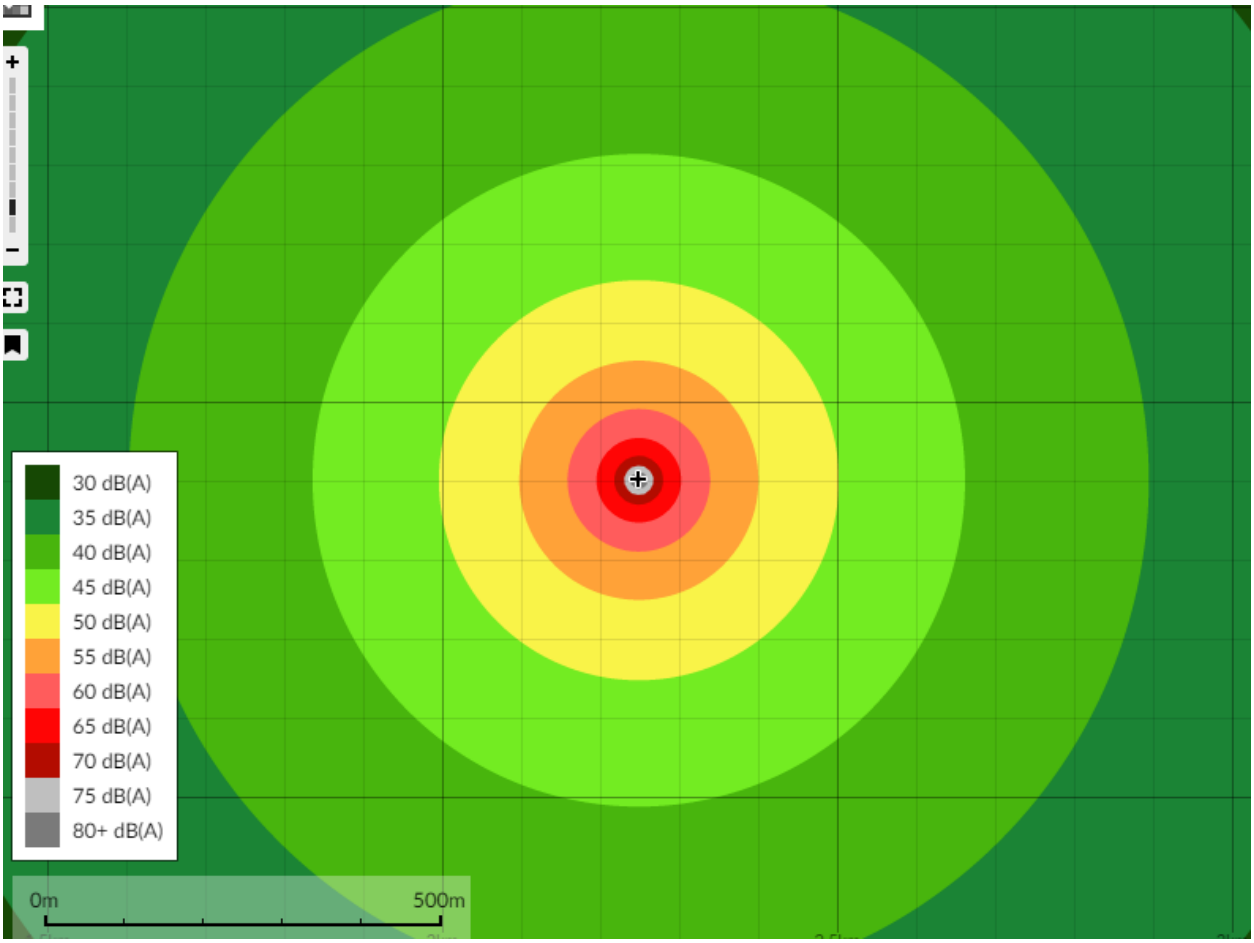

Figure 3 – Sound propagating away from a point source in a horizontal plane (1 meter= 3.3 feet)

Sound also propagates away from a source in the vertical direction. Figure 4 shows a three dimensional view of the vertical plane of sound propagation together with the horizontal plane. (The noise mapping software does not display distances in three dimensional plots.) The three dimensional behavior of sound becomes important to estimate the sound traveling up a hill, to a second story window, over a building, or to an apartment/condominium balcony.

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Figure 4 – Sound propagating away from a point source in a horizontal and vertical plane

Human Hearing and Annoyance

The human ear is sensitive to a sound's level, its frequency content, its duration, and its frequency of occurrence (2). All of these contribute to annoyance. The higher the sound level, the greater the annoyance becomes. The human ear is only sensitive enough to detect a change in sound level of 3 dB. Each 10 dB increase in sound level is perceived as a doubling in the sound level. In the same manner, each decrease of 10 dB is perceived as one half the loudness. A 20 dB increase is perceived as 4 times as loud. Similarly, a 20 dB decrease is perceived as 1/4 as loud.

Hearing is more sensitive to high frequency sounds than to low frequency sounds. Sound measurements made with an A weighting scale match the frequency sensitivity of the human ear. These are described as dBA levels.

Another factor in annoyance is the interval or space between sounds. Intermittent sounds or impulsive sounds are considered more annoying than a steady state sound of the same dB level. All these elements contribute to annoyance and are critical to the noise measurements in noise ordinances.

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While response to noise is subjective and varies among individuals, the following guideline can be used to rate annoyance to LAFmax levels from pickleball for a person of normal hearing sensitivity, regardless of distance from the noise.

- less than 50 dB LAFmax (green zones) – perceptible and acceptable
- 50 to 54.9 dB LAFmax (yellow zones) - marginally bothersome
- 55 to 59.9 dB LAFmax (orange zones) - bothersome
- 60 to 64.9 dB LAFmax (pink zones) – bothersome to annoying
- 65 to 69.9 dB LAFmax (red zones) - annoying
- greater than 70 dB LAFmax (dark red zones) – very annoying

To reduce the annoyance of any noise level, the distance between the source and receiver must be increased or noise control measures must be implemented.

Noise Ordinances

In simple terms, noise is sound that annoys. Community noise ordinances establish noise limits so that noise is neither annoying nor bothersome, even though it may be audible. These ordinances are not intended to establish a limit where sound is inaudible. They are intended to establish a limit where the presence of noise above a background noise level will not be objectionable. The background noise level is the result of wind, trees, birds, normal ambient sounds, and sometimes traffic. Noise ordinances use different noise metrics to quantify the time varying loudness of different types of noise.

Because continuous sounds and impulsive sounds have distinct characteristics that cause them to be perceived differently by human hearing, the noise limits for both types of sounds must be separately stated. This is because the ear responds differently to continuous and impulsive noises.

Austin, TX Noise Ordinance

Chapter 9-2 of the Code of the City of Austin, Texas has a limit of 75 dBA at a residential property line (5). Per item 9-2-1-3, a fast meter response is used for measurement and analysis as this is more applicable to measurement of pickleball impacts than a slow meter response. The ordinance has no added penalty for impulsive noise. A noise level of 75 dBA LAFmax would meet the noise code but would still be annoying to a homeowner. This ordinance does not have sufficient detail to quantify annoyance from pickleball noise.

Recommended PSM Consulting Standard for Pickleball Sound

PSM Consulting (PSMC) has used its experience with pickleball sound measurements to develop an improved standard for pickleball noise. The PSMC noise limit for pickleball noise is based on the background sound. Background sound should be measured using A-weighted equivalent sound level

(LAeq) or A-weighted slow response (LAS). These are both long term averages of sound fluctuations with an A-weighting. These measurements are commonly used for environmental studies of background sound. This PSMC standard sets an LAFmax level as a limit where pickleball sound would not be annoying.

The recommended noise limit at a property line for pickleball play to avoid annoyance follows.

- When the background sound level is at or below 47 dB LAeq, the limit for pickleball noise should be 50 dB LAFmax.
- When the background sound level is above 47 dB LAeq, the limit for pickleball noise should be 3 dB LAFmax above the background level.

These limits refer to noise levels at a property line. This location follows the standard practice for most community noise ordinances of setting limits at a property line. The noise levels at a pool, at a backyard patio, or at the house will be even lower due to the added distance from the property line.

If pickleball courts are in a quiet residential neighborhood with background sound at 47 LAeq, then a limit for pickleball noise at 50 dB LAFmax should be set. With the background sound level at 47 dB LAeq, pickleball impacts at 50 dB LAFmax will be faintly audible. For any lower levels of background sound, pickleball impacts may be perceptible but not bothersome due to the 50 dB LAFmax limit.

Pickleball sound at 50 dB LAFmax should not be bothersome to a person with normal hearing sensitivity for these reasons.

- 50 dB LAFmax is the noise level of a large, busy office.
- 50 dB LAFmax is not loud enough to be objectionable even due to its intermittent nature.

If pickleball courts are near a location with high background noise at 55 LAeq, then a limit for pickleball noise at 58 dB LAFmax (55+3) should be set.

This guideline provides a variable limit for pickleball noise at a property line depending on the background sound levels. Its use has been supported by successful applications at multiple pickleball sites. This standard for pickleball noise is recommended to avoid community or homeowner annoyance from pickleball play.

PSM has successfully applied these limits to several pickleball facilities and to homeowner associations concerned with pickleball noise. They have been used to judge annoyance at specific home locations with no mitigation in place and to confirm the performance of noise mitigation strategies.

The Pickle Ranch, Austin , TX

Figure 5a shows an aerial view from Google Earth of the pickleball courts at the Pickle Ranch (6) together with the nearest homes to the courts in the Old West Austin Neighborhood (OWAN). The topography for the area was taken from Google Earth and was included on the sound map. The area has a hilly terrain with the elevation rising to the north and to the northwest of the courts.

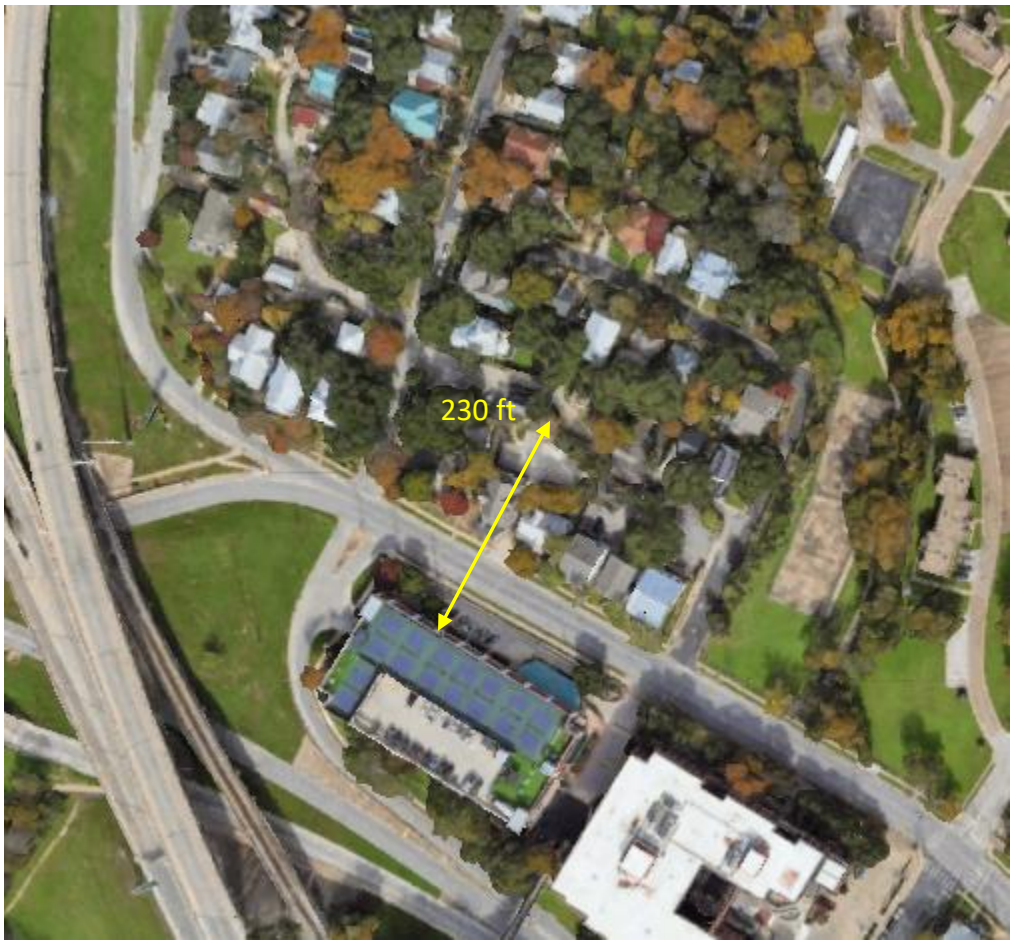

Figure 5a – Pickleball courts at Pickle Ranch and nearby homes in OWAN

Property lines for homes in OWAN were taken from real estate maps on Zillow.com. The closest property line to the pickleball courts is 1709 Francis Avenue, which is approximately 230 feet from the northeast pickleball fence. The dimensions of the homes and the roof heights for nearby homes were taken from Google Earth for inclusion in the noise map. Figure 5b shows a three dimensional view of the homes and the pickleball courts that were included in the model.

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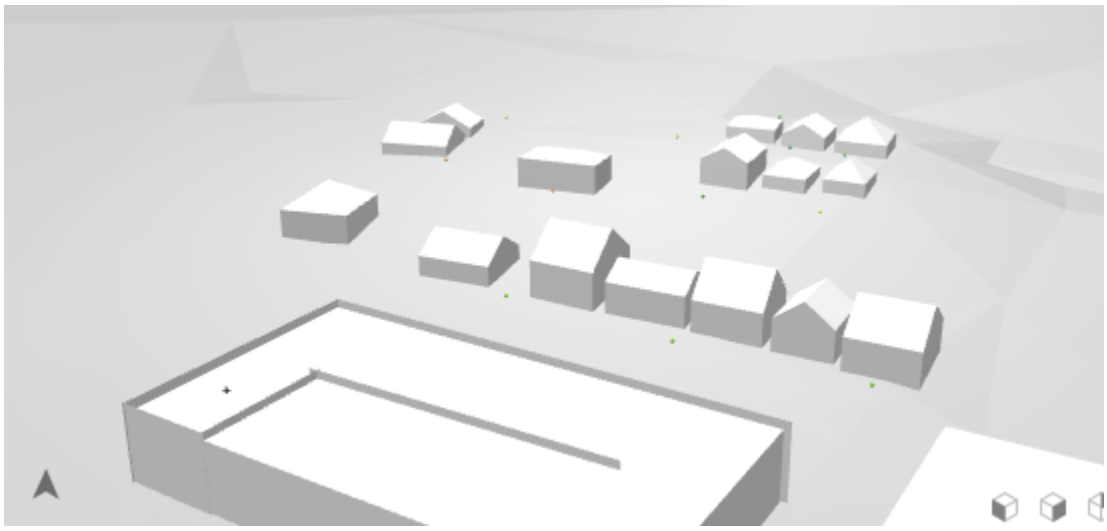

Figure 5b – Pickleball courts at Pickle Ranch and nearby homes in OWAN – three dimensional model

Figure 6 shows a cross section, a land contour, from the courts on West 6th Street to the homes on Francis Street. The courts on the fourth floor of the parking garage are at the level of the roof lines of the 1 and 2 story homes on Francis Avenue.

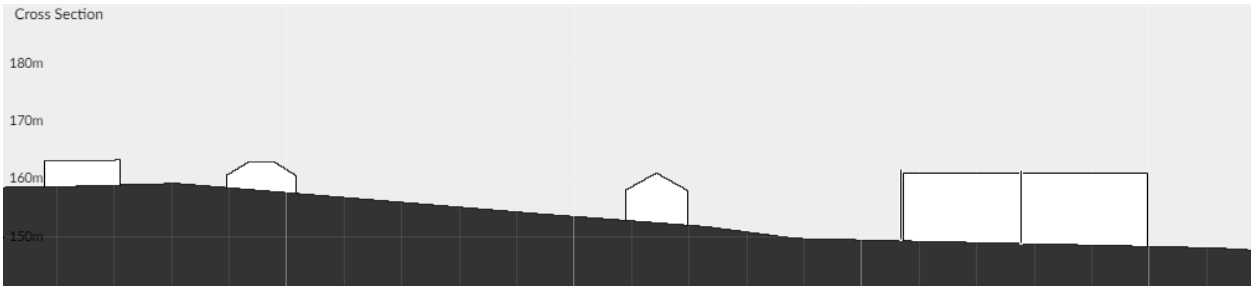

Figure 6 – Cross section of contour from West 6th Street to Francis Avenue

Per Figures 3 and 4, pickleball noise can come from any location on a pickleball court when a player strikes a ball. Pickleball noise travels away from the source in all directions. The loudest pickleball noises will occur in the primary direction of ball travel across the net. In addition, the positions of players change frequently during a game so that some shots (and the direction of sound) will continually change. The noise map will display noise levels in all directions away from the courts. Four court positions were selected on the rooftop to show the influence of line of sight noise propagation from these source positions into the neighborhood. These courts are numbered 1, 2, 3, and 4 in Figure 7. The noise analysis will show the relationship between the source location (the court) and distance to a receiver (a home) and the effect of homes that block sound traveling along a direct line of sight or a reflected path between a source and receiver.

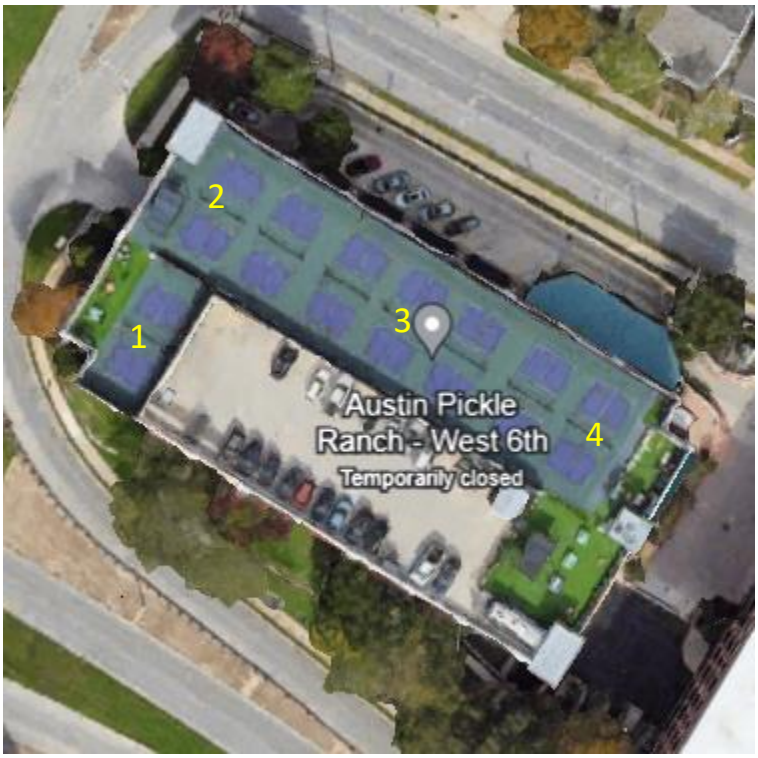

Figure 7 – Pickleball court numbers

The background noise level was assumed to be 47 dB LAeq which is typical of a residential neighborhood. The PSMC noise limit of 50 dB LAFmax was therefore used.

Figures 8a, 8b, 8c, and 8d show the noise levels at multiple locations in OWAN with pickleball play on courts 1, 2 3, and 4, respectively. The white circles indicate LAFmax levels in dB at each location at a height of 1.5 meters or 5 feet. This height is ear level for most people. Noise levels above 50 dB LAFmax occur at multiple locations and would be bothersome.

Figure 8a – Noise levels in OWAN from court 1

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Figure 8b – Noise levels in OWAN from court 2

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Figure 8c – Noise levels in OWAN from court 3

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Figure 8d – Noise levels in OWAN from court 4

Table 1 shows the noise levels at 6 property locations based on pickleball play from these four courts. The highest noise level at each property is indicated and the court that creates this highest noise level is listed. The highest noise level was 59 dB LAFmax at 1705 Francis Avenue. This was with pickleball play on court 3. This noise level is considered bothersome and borders on being annoying. Court 3 and then court 2 were selected as worst case scenarios for noise propagation to OWAN to evaluate noise mitigation strategies.

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Table 1 – Noise level summary

	LAFmax				Highest	Noise
Receiver	**court 1**	**court 2**	**court 3**	**court 4**	**LAFmax**	**Source**
606 Patterson Avenue - front yard	56	58	57	55	58	Ct 2
607 Patterson Avenue - side yard	55	58	57	42	58	Ct 2
1709 Francis Avenue - back yard	42	47	58	50	58	Ct 3
1705 Francis Avenue - back yard	54	56	59	46	59	Ct 3
1704 Francis Avenue - front yard	38	38	56	44	56	Ct 3
1702 Francis Avenue - front yard	41	41	56	45	56	Ct 3

Figures 9a and 9b show color noise maps for noise from court 3 and court 2, respectively, for the surrounding areas of OWAN. Any areas not in a green zone are above the target of 50 dB LAFmax. A dark green zone is better than a light green zone as dark green indicates an even lower noise level. This figure highlights several points about noise propagation to each home in OWAN.

- With no homes to block a direct line of sight to the courts, noise levels decrease with distance from the courts.
- Homes along West 6th Steet and throughout the neighborhood block sound traveling away from the courts.
- It is quieter on the side of the house away from the courts than on the side facing the courts.
- A shadow zone exists on the side of the house away from the courts – the house and the roof line function as sound blockers or barriers.
- Through this blocking effect, it is possible to have lower sound levels near the courts than farther from the courts that are in a direct line of sight.
- The space between houses “channels” sound deep into the neighborhood until it is blocked by another house. This is evident with yellow/orange bands of sound propagation between houses.
- Through this channeling effect, it is possible to have higher sound levels farther from the courts than near the courts - depending on the line of sight.

Figure 10 shows a cross section of noise levels through the noise source on court 3 and up the hill to Francis Avenue. The shadow zone effect of the roof lines is more clearly seen here.

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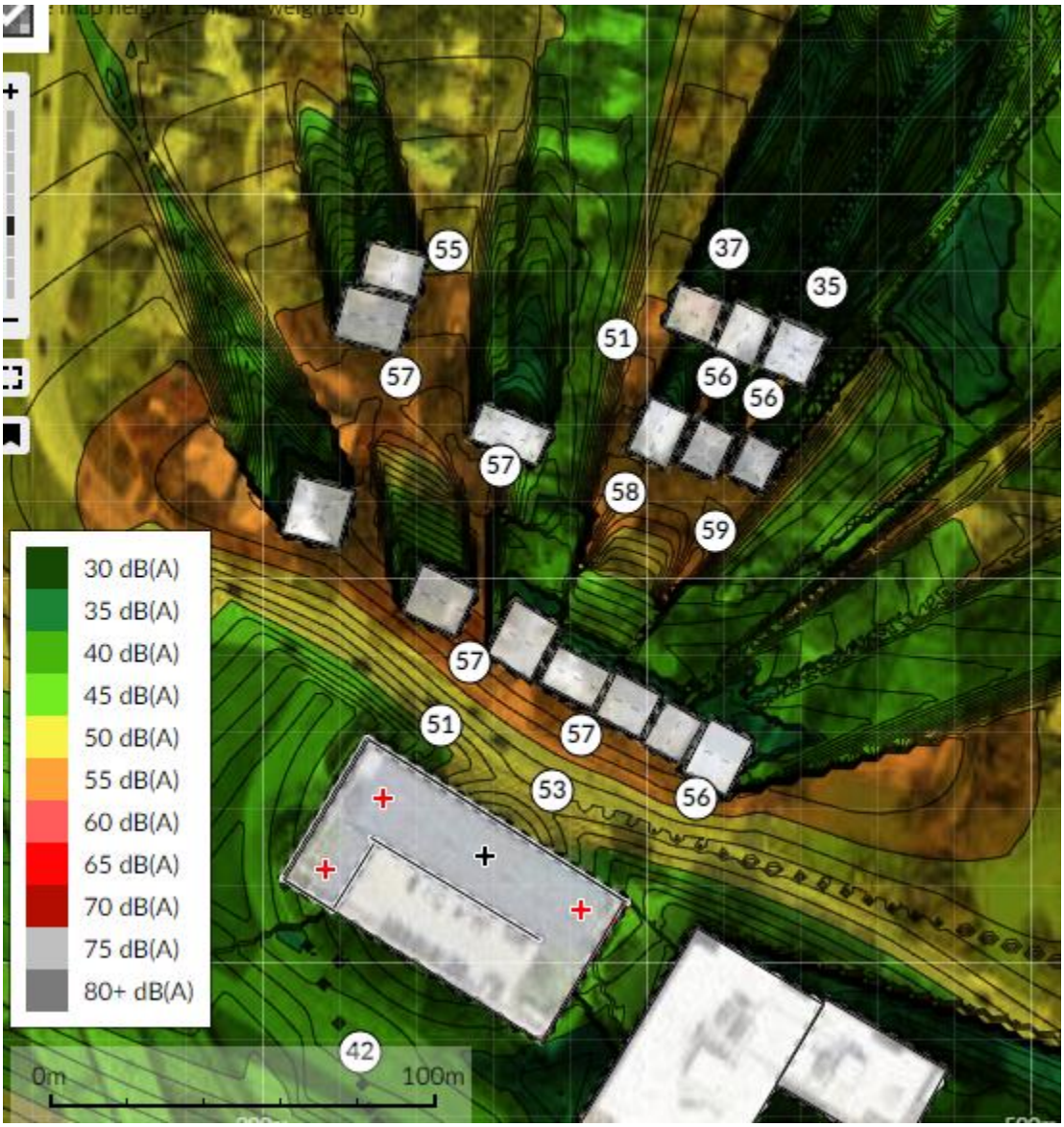

Figure 9a – Noise levels in OWAN from court 3

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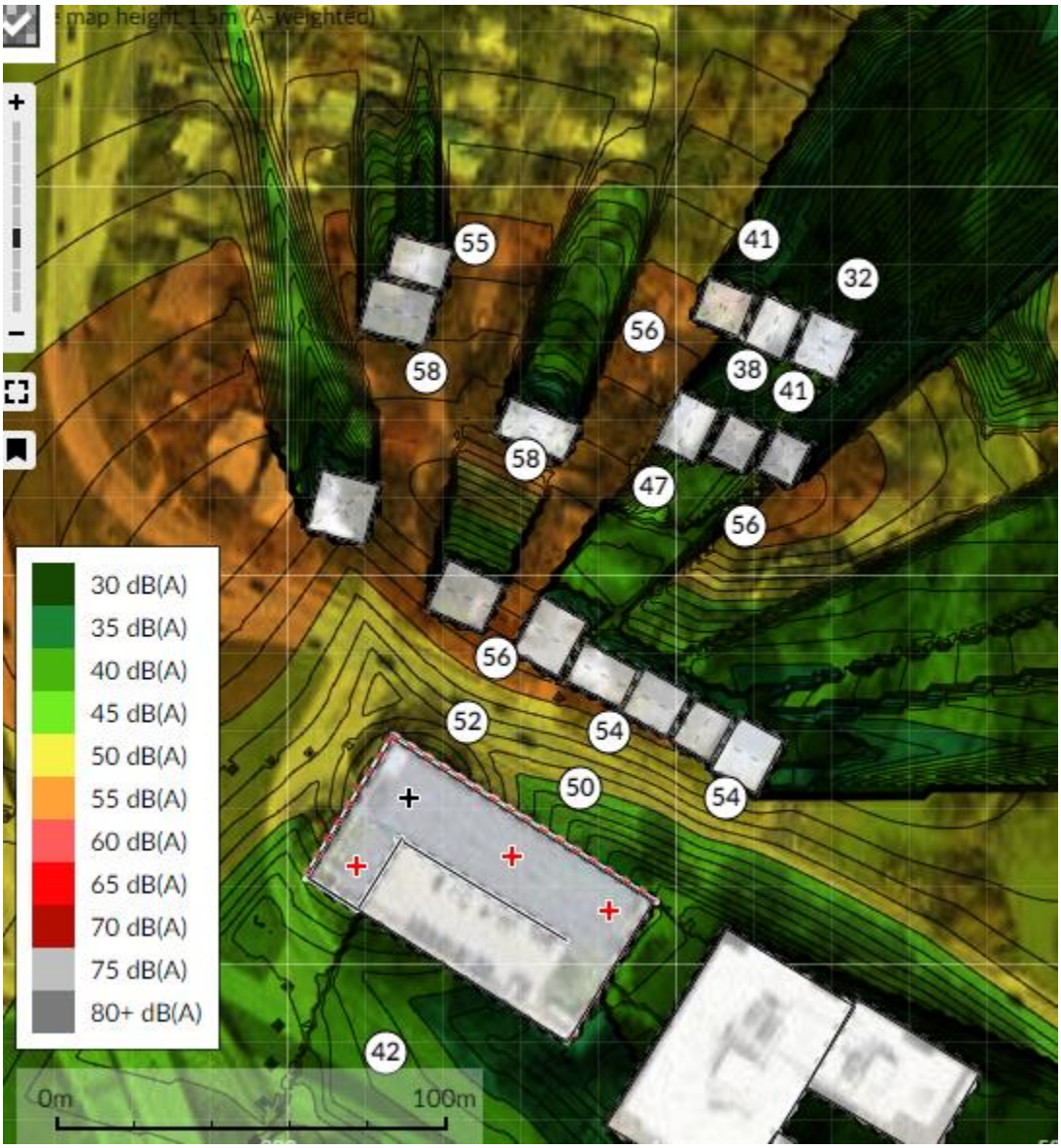

Figure 9b – Noise levels in OWAN from court 2

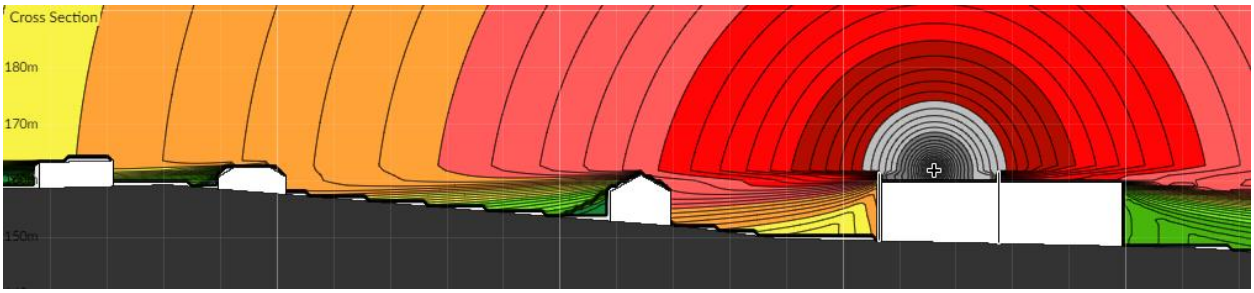

Figure 10 – Noise levels in OWAN from court 3 – cross section through noise source to northeast

Noise mitigation strategies were next evaluated to create green noise zones for homes in OWAN. The most effective noise mitigation option is a noise barrier to block sound. A noise barrier was placed on the northeast and northwest perimeter of the rooftop pickleball courts. (A description of sound barriers and suppliers is presented in Appendix A.)

The height of the barrier was evaluated at 6, 7, 8, and 10 feet. Only the 10 foot barrier was able to reduce the noise level to 50 dB LAFmax. This is because a 6 foot tall pickleball player with a 2 foot arm extension is striking an overhead smash at 8 feet above the court surface. This 10 foot barrier is more effective than a shorter barrier and is required for the greatest noise reduction. Figures 11a and 11b show that the 10 foot sound barrier reduced noise at the critical homes to 50 dBA LAFmax or below for play on courts 3 and 3, respectively.

Figure 11a – Noise levels in OWAN from court 3 with 10 foot sound barrier on northeast and northwest perimeter

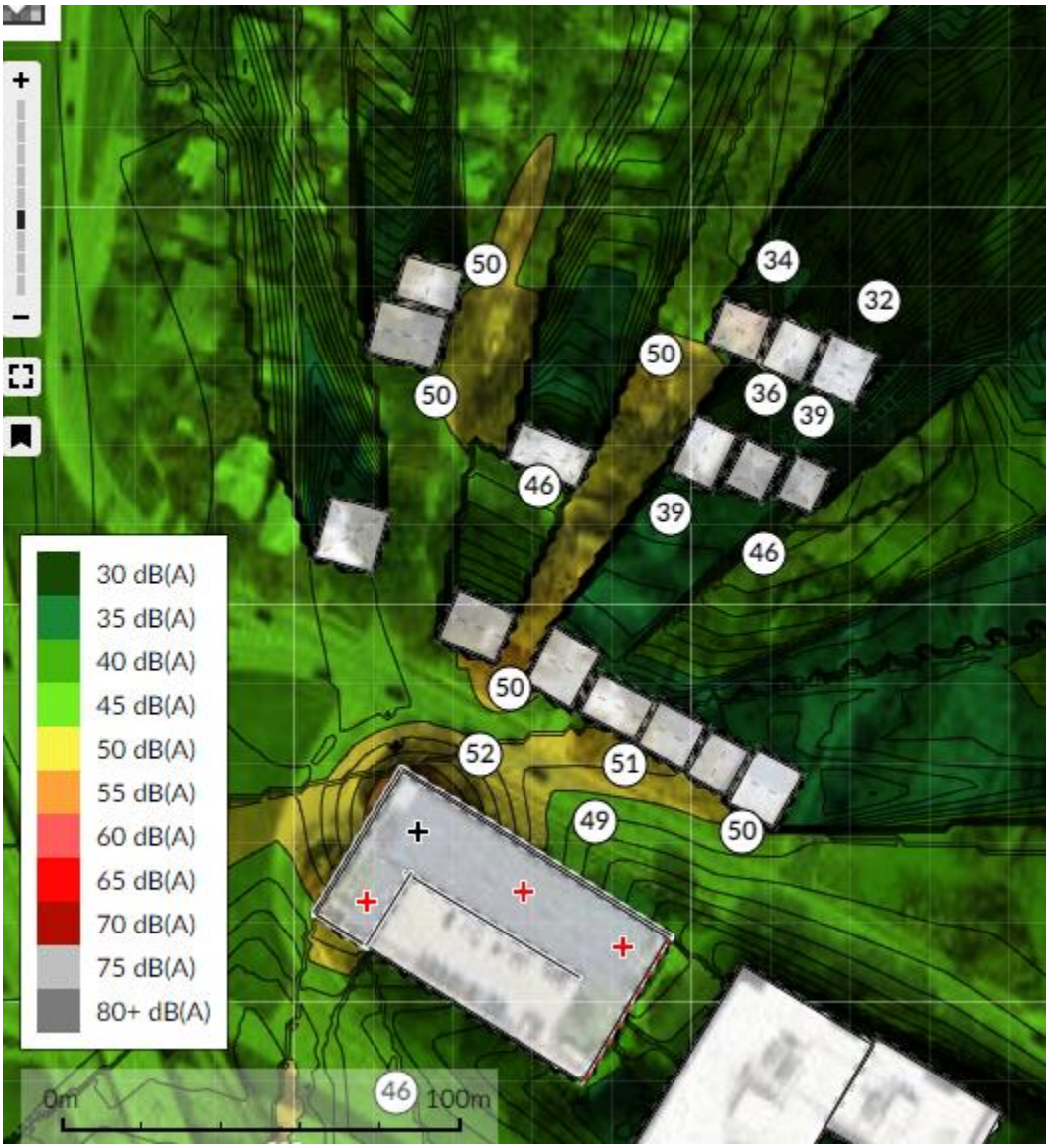

Figure 11b – Noise levels in OWAN from court 2 with 10 foot sound barrier on northeast and northwest perimeter

A color comparison between Figures 9a and 11a and between Figures 9b and 11 b shows the change in noise level (loudness) with the 10 foot barrier. Figures 11a and 11 b show more green zones. An expanded view of the noise maps showed that the yellow zones in both figures are 51 dB LAFmax and would not be different audibly to 50 dB LAFmax.

Table 2 shows the before and after noise levels at the 6 homes with the noise reduction provided by the 10 foot barrier for the 2 different courts. The noise reduction at these homes changes due to differences in the line of sight, the distances to homes, and the presence of homes that help to block sound. The noise reduction via the barriers was 6 to 13 dB LAFmax from court 3 and 2 to 12 dB LAFmax from court 2.

Table 2 – Noise level reduction with 10 foot sound barriers

	LAFmax from court 3			LAFmax from court 2		
Receiver	**Before**	**After**	**Reduction**	**Before**	**After**	**Reduction**
606 Patterson Avenue - front yard	57	50	7	58	50	8
607 Patterson Avenue - side yard	57	44	13	58	46	12
1709 Francis Avenue - back yard	58	47	11	47	39	8
1705 Francis Avenue - back yard	59	50	9	56	46	10
1704 Francis Avenue - front yard	56	50	6	38	36	2
1702 Francis Avenue - front yard	56	50	6	41	39	2

Compared to Figure 10, Figure 12 shows the cross section of sound propagation with the 10 foot barrier at the edge of the rooftop courts. This barrier blocks noise that previously would be at the rooftop level at Francis Avenue.

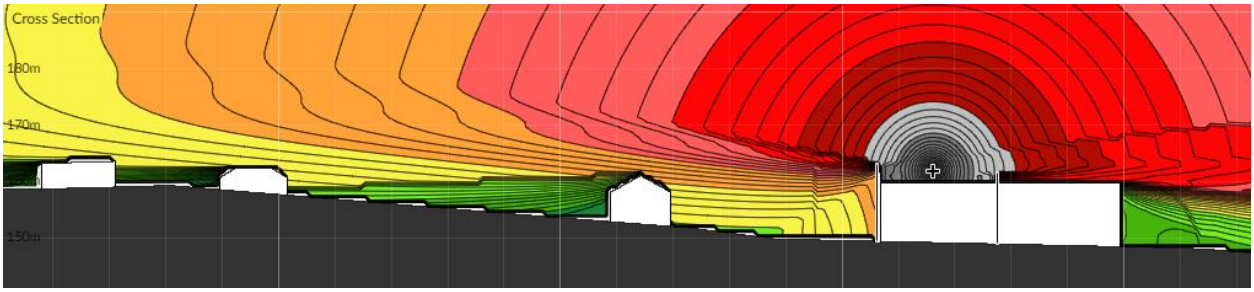

Figure 12 – Noise levels in OWAN from court 3 with 10 foot sound barrier – cross section to northeast

Figure 13 shows a three dimensional view of the courts and the homes in OWAN that were included in the sound map together with the noise levels from the sound map. The 10 foot barrier height on the northeast and northwest boundaries of the roof top courts is evident when compared to the roof line in Figure 5 b. The noise levels in the yellow zones are 51 dB LAFmax and would not be perceived differently than 50 dB LAFmax.

The sound level on the south side of the courts at ground level increased from 42 dB LAFmax to 46 dB LAFmax for play on courts 2 and 3. This shows that the barrier is redirecting noise away from the OWAN homes and to the south. With no homes to the south, this is a reasonable approach to noise mitigation.

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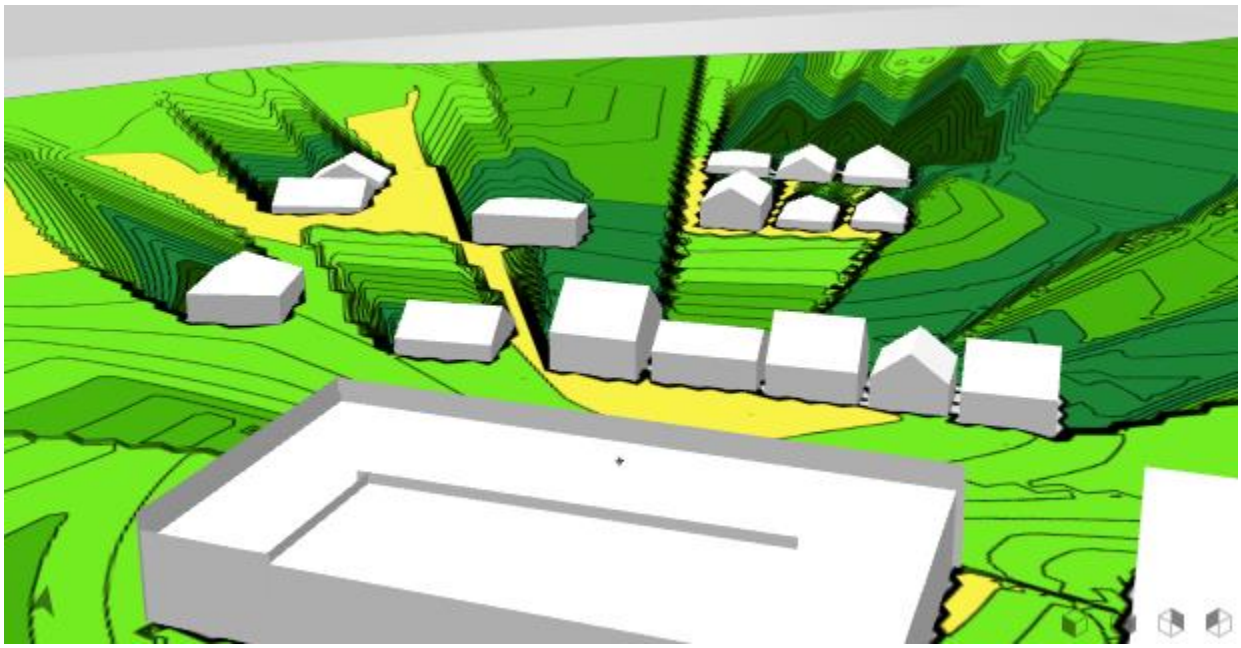

Figure 13 – Noise levels in OWAN from court 3 with 10 foot sound barrier – 3D view

This two-sided barrier design for pickleball noise mitigation offers several benefits to the residents of OWAN.

- The barrier is high enough to block sound at the rooftop level for the ground level of homes in OWAN that are at an elevation near the fourth story courts on West 6th Street.
- The barrier reduces noise to a level where it will not be bothersome to a person with normal hearing sensitivity.
- The barrier redirects sound to the south where there are no residential properties.
- Higher background sound than 47 dB LAeq from traffic to the west will further help mask the pickleball impacts.

This two-sided barrier design for pickleball noise mitigation offers several benefits to the pickleball courts at Pickle Ranch.

- The barrier provides a successful sound mitigation strategy that allows the courts to operate in a commercial area near a residential zone.
- The 2-sided barrier eliminates the higher cost of a 4-sided barrier enclosure.
- The 2-sided barrier avoids sound reflections from opposite barrier walls that can often be redirected back to the nearby homes. This can lead to more expensive options such as higher barrier walls or barriers with sound absorbing liners.
- The barrier design does not require higher priced sound barriers with sound absorbing liners on the court side.
- The 2-sided barrier allows an open court design for air circulation and for minimizing heat build-up on the courts.

Conclusions

The following conclusions are made from the results in this study.

1. The noise code of the City of Austin does not have sufficient detail to quantify the annoyance from pickleball. PSMC used a target of 50 dB LAFmax as a recommended noise limit.
2. Noise levels from rooftop pickleball from the Pickle Ranch are 59 dB to 56 dB LAFmax at property lines on Francis Avenue and Patterson Avenue. These levels would be considered bothersome and annoying.
3. These noise levels will be present with play on any of the 8 courts in use at the Pickle Ranch.
4. A 10 foot sound barrier on the northeast and northwest sides of the rooftop pickleball courts reduced noise to acceptable levels for homes in OWAN.
5. The noise reduction with this barrier ranged from 2 dB to 13 dB LAFmax depending on the court in use and on the distance and direction of the home from the courts.

Recommendations

The following recommendations are made for the noise reduction from pickleball play at Pickle Ranch.

1. For the noise from pickleball play to be acceptable to the residents of OWAN, a 10 foot sound barrier is needed on the northeast and northwest perimeter of the rooftop courts.
2. The barrier should be 1 pound per square foot or greater to reduce pickleball noise. It does not need a more expensive sound absorbing liner on the court side.
3. The color and design of the barrier should be compatible with the architectural requirements of the surrounding area.

PSM LLC has provided these recommendations on reductions of pickleball noise at Pickle Ranch to balance the growth and popularity of pickleball with required noise level reduction for nearby residents of OWAN. The goal is to address quality of life for the residents living near the pickleball courts. PSMC LLC is available to answer any questions related to this work.

Disclaimer

The results, conclusions, and recommendations presented here are based on information provided to PSMC LLC by the client and on measurements made using calibrated equipment and standard acoustical practices. These results are intended to address maximum noise levels from play. Pickleball sound assessment is a random process where the noise from each impact and from each game can vary based on player skill, force of impact, and equipment in use. Sound levels from pickleball are random impulsive events, meaning that it is predictable over a range and has averages and other statistical characteristics, but it has no exact single level. Actual sound levels will vary over time. In addition, it is not possible to determine what any particular person believes is an acceptable sound level. Because additional variables may be associated with the site, the players, or the equipment in use, PSMC LLC assumes no liability for work undertaken by the client based on these recommendations, or for results that do not conform to the client's expectations.

Barry R Wyerman, PhD, PE
Principal Acoustical Consultant
PSM Consulting LLC

Rev 1 – September 7, 2024
Recommendation number 3 - Removed PSM Consulting's mention of specific colors for a sound barrier to allow the barrier to be of any color or design compatible with the architectural requirements of the surrounding area.

Reference Sources

1. ANSI S1.4 Specification for Sound Level Meters
2. Handbook of Acoustics, Everest, F, Alton and Pohlmann, Ken C., fifth edition, 1979.
3. ANSI S12.9 Quantities and Procedures for Description and Measurement of Environmental Sound
4. https://noisetools.net/dbmap/ - Noise Mapping Tool
5. Noise code of the City of Austin, Texas https://library.municode.com/tx/austin/codes/code_of_ordinances?nodeId=TIT9PRAC_CH9-2NOAMSO
6. Austin, Texas, West 6th Street - Google Earth https://earth.google.com/web/@30.27633413,-97.76498553,150.16854646a,634.9930276d,35y,0.00019926h,0t,0r/data=OgMKATA

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PSMC LLC Information

PSM Consulting LLC

PSMC LLC was created in 2022 after 8 years of pickleball noise studies and advice on pickleball noise mitigation. This work included field measurements of pickleball play at multiple sites, analysis of the noise from different pickleball paddles and balls, consultation with USA Pickleball on equipment standards, and evaluation of suppliers of noise barrier systems. PSMC has designed successful noise reduction systems for pickleball courts and has evaluated multiple paddles and balls to create lists of "quieter" paddles and balls. It has also completed field studies of pickleball noise to provide guidance to homeowners regarding local noise ordinances. In total, PSMC has completed or has been involved in noise surveys and recommended noise mitigations measures for 100 pickleball sites. PSMC is at the forefront of pickleball technology and is working directly with USA Pickleball to develop acoustical test methods for paddles, to identify quieter gear, and to create improved community standards for pickleball noise. It is also working with paddle manufacturers to help bring improved, quieter paddles to the market. PSMC LLC has developed the industry's first anechoic chamber for testing both pickleball paddles and balls under controlled speed conditions. This provides baseline data on paddles without the variables of background noise and player skill in hitting the ball.

The mission of PSMC is to support pickleball clubs, pickleball players, communities, parks and recreation departments, country clubs, and homeowner associations with an understanding of pickleball noise and of strategies and measures to control pickleball noise.

Barry Wyerman, PhD, PE

Barry Wyerman, PhD, is the Principal Acoustical Consultant for PSMC LLC. He is a pickleball player and a USA Pickleball Level 2 Referee. His professional background includes over 45 years of acoustical experience in creating innovative acoustical products, solving industrial noise control and vibration problems, and designing solutions for automotive noise and vibration control. He is the owner of Acoustical Design and Consulting, LLC, which provides engineering and consulting support in all areas of acoustics and noise control. He has a BS degree in physics from Ohio University and MS and PhD degrees in engineering acoustics from Penn State University. He became involved in pickleball noise mitigation when he provided initial recommendations on pickleball noise control from his work experience and acoustical training. His professional associations include:

- The Acoustical Society of America
- Society of Automotive Engineers, Noise and Vibration Committee
- Society of Automotive Engineers, Acoustical Materials Committee
- Professional Engineer, registered in Ohio

Appendix A - Sound Barriers

Sound barriers block the direct path of sound as it travels from a source to a receiver. A barrier must be massive enough to block sound that could pass through it. The recommended weight for a barrier is one pound per square foot. A small amount of sound still passes over the top or around the edges of a barrier. This is called diffracted sound. With this weight barrier, the sound reduction is limited only by the height and width of the barrier.

The barrier must be solid with no holes, no gaps at the bottom, and no gaps between adjoining panels. Any holes or openings will allow sound to leak to the other side. Earth mounds and buildings can function as barriers if they are high enough and wide enough to disrupt a direct path of sound.

Shrubs, bushes, and trees are NOT barriers even though they block a line of sight. They are not massive enough and not solid enough to block sound. A small amount of sound attenuation may be achieved with a dense planting of hedges, but this would not provide more than 1 dB sound reduction even if the hedges were 3 or 4 feet in depth and 12 feet high. These are primarily a visual barrier.

The effectiveness of a high mass barrier is controlled primarily by its height and then by its width. The barrier must be tall enough and wide enough so that it minimizes the sound that is diffracted or bent over the top and around the edge. The amount of sound diffracted over the top and around the edge can be minimized as the barrier becomes higher and longer. As the height of a sound barrier increases, a point of diminishing returns is reached. This means that a percentage increase in height (and cost) will result in a lower percentage improvement (or return on benefits) in noise reduction. In some cases, it may be best to enclose all four sides of a pickleball court with the highest barrier possible. If there are no homes exposed to pickleball sound from a side of the court, then a barrier can be eliminated on that side.

Common vendors for sound barriers are:

- Acoustiblok, Tampa, FL, 813-980-1400, https://acoustiblok.com/acoustiblok-soundproofing-product-lines/acoustifence-noise-reducing-fences/ (printed barriers)
- Insul-Quilts USA, South El Monte, CA, 833-853-6444, https://www.insulquilt.com/
- eNoise Control, Noblesville, IN, 866-481-2024, https://www.enoisecontrol.com/
- DDS Acoustical Specialties, Westfield, MA 413-248-8118, https://ddsacoustical.com/
- Hushtec USA, Connecticut, 860-289-8033, https://hushtecusa.com/ (clear barriers)
- Putterman Athletics LLC, DeLand, FL, 800-621-0146, https://www.puttermanathletics.com/
- FenceScreen, Grand Prairie, TX, 888-313-6613, https://www.fencescreen.com/

All barriers of the same weight would perform the same. None of these products are noticeably different other than by the color or by printing. Any differences in product sheets can be due to lab differences in testing. Noise barriers should weigh one pound per square foot to block any sound that could pass through the barrier. The effectiveness of this high weight barrier can still be compromised by the sound that is

diffracted over the top or around an edge. A contractor must be consulted to assure that an existing fence or a new fence can support the added weight of a barrier. Wind loads on the barrier are also to be considered.

Some barriers are available with a sound absorbing lining material on the side facing the noise source – if this is needed. This sound absorbing lining can reduce the noise level on the court by reducing the reflected sound as it bounces between the side walls. It can also be effective in reducing reflected sound in the opposite direction away from a barrier if only one side of a court has a barrier. However, the sound absorbing lining has no impact on the sound passing over the top of the barrier. This direct path of sound is not influenced by anything on the side walls. The sound absorbing liner is more for noise reduction for the players than for any nearby residents exposed to sound.

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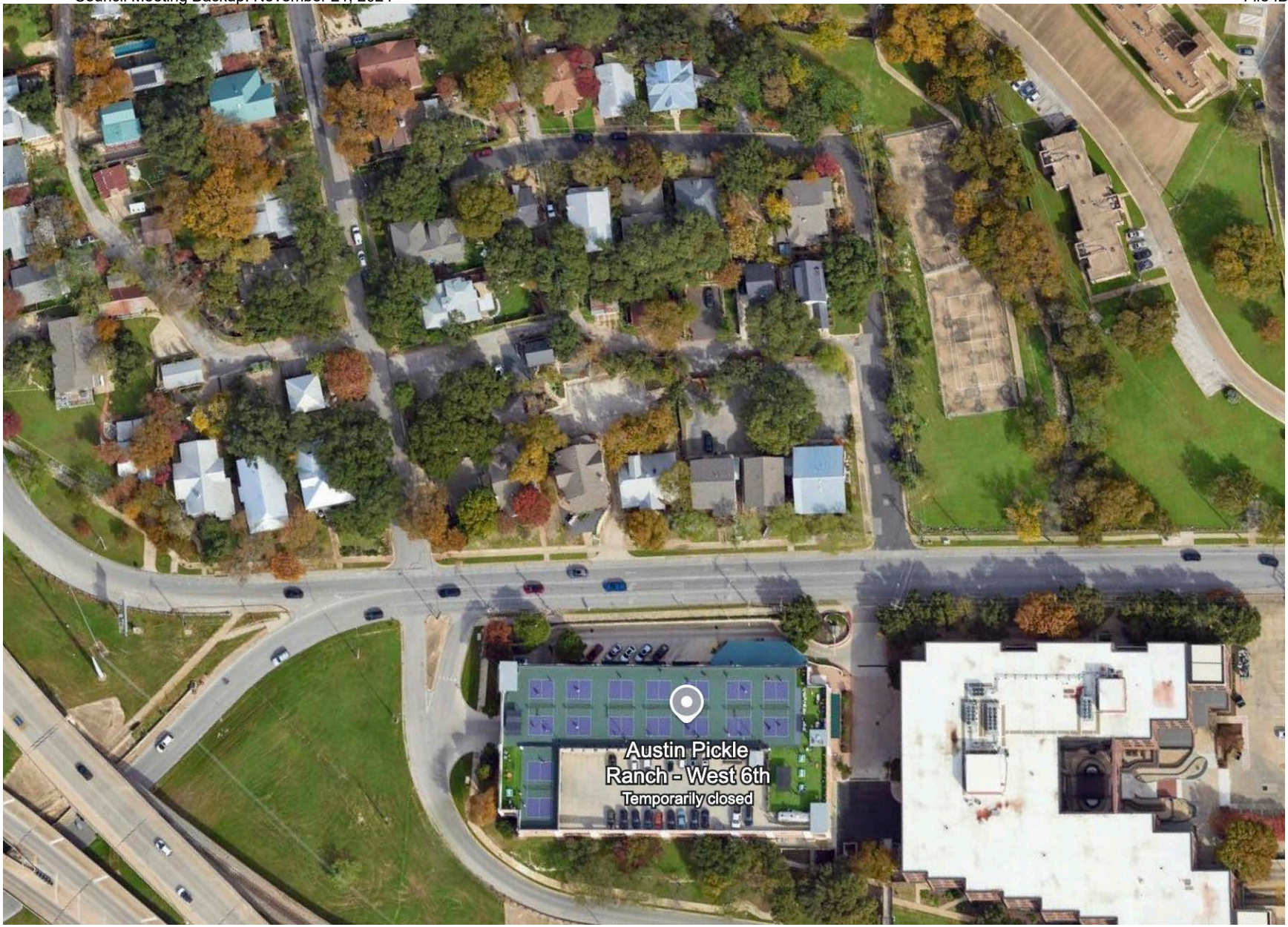
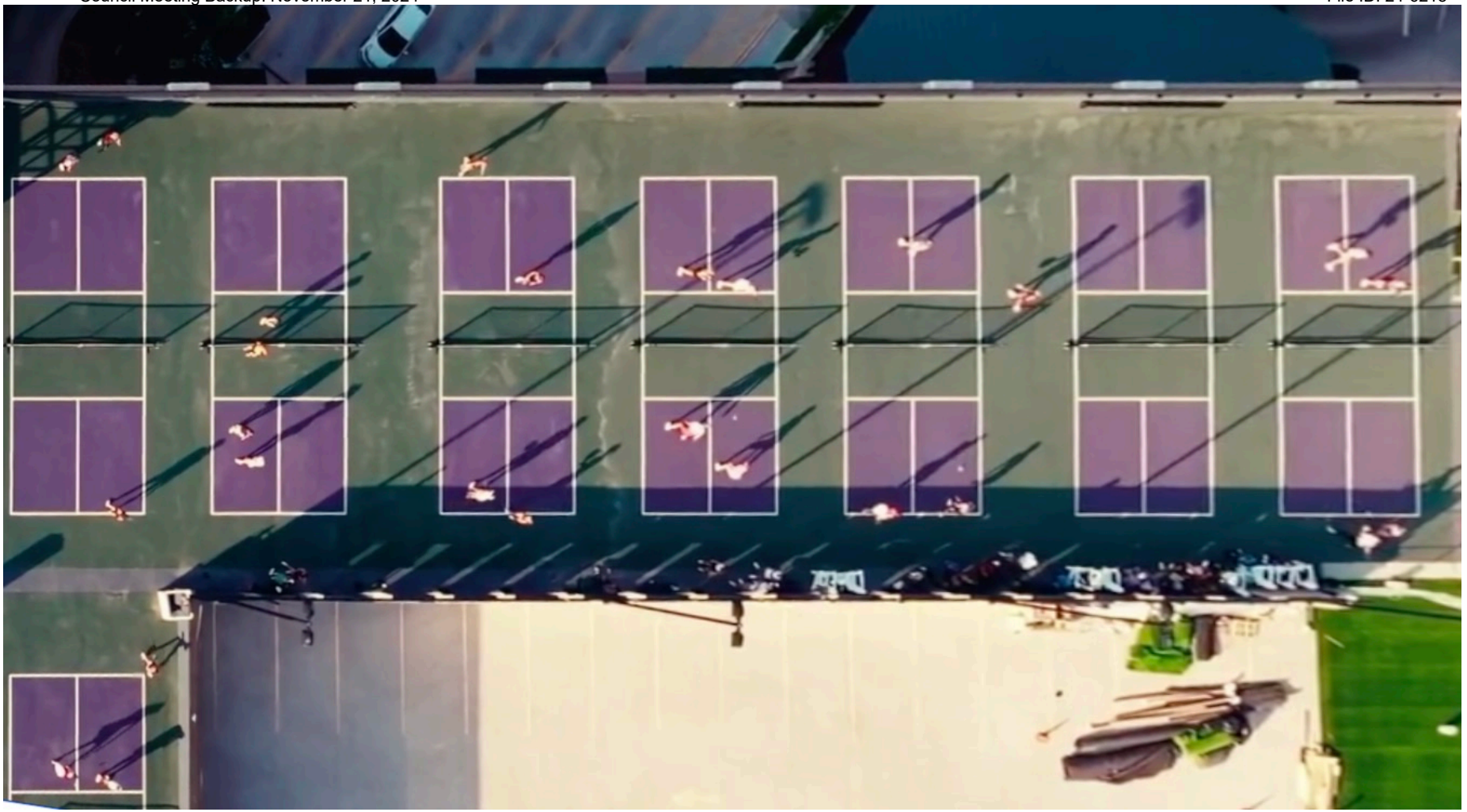
Google
ILLEGAL RIGHT TURN

Email from Donna Osborn
To: Jonathan Tomko
9/10/24 12:05pm


Austin Pickle
Ranch - West 6th
Temporarily closed

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MEMORANDUM

To:	Conor Byrne, APR	BAi Project No:	7129 Date: 5/29/2024
		Project Name:	Austin Pickle Ranch Sound Monitoring
		From:	**Andy Miller**
		E-mail:	**amiller@baiaustin.com**

EQUIPMENT

An EN/IEC class 1 and ANSI S1.4 type 1 precision sound analyzer – Norsonic Nor145 with type 1209 microphone and type 1209A preamplifier – was calibrated using an IEC class 1 sound calibrator – Norsonic model nor1256. The sound analyzer was calibrated prior to initiating the sound monitoring and checked at the conclusion of the monitoring period, per measurement standard requirements.

SETUP TIME AND LOCATION

The measurement equipment was located on the roof of a business directly across the street from and at approximately the same elevation as the Austin Pickle Ranch pickleball courts. This is referred to as “Measurement Location 1” or “Roof Location” (Refer to *Figure 1* below showing the equipment in its final recording state.)

Figure 1. Microphone mounting location on the ridge of the roof of a neighboring property across the street, to evaluate sound transmission level to other properties.

The equipment was put into service recording measurements and audio at this location at 2:14 p.m. on Thursday, April 18 and recording was stopped at 1:52 p.m. on Monday, April 22.

A second measurement location on the edge of the parking garage parapet (the wall of Austin Pickle Ranch) was also selected, directly behind a pickle ball court. The equipment was put into service at 2:38 p.m. on Monday, April 22, and recording was stopped at 9:10 p.m. the same day. This measurement location is referred to in this report as “Measurement Location 2” or “APR Location.”

These measurements and recordings were used to evaluate the influence of sound from pickle ball play on site noise levels at various locations, as discussed below, especially relative to the City of Austin code on noise restrictions. The figure below illustrates the relationships among the properties and measurement locations with a satellite image.

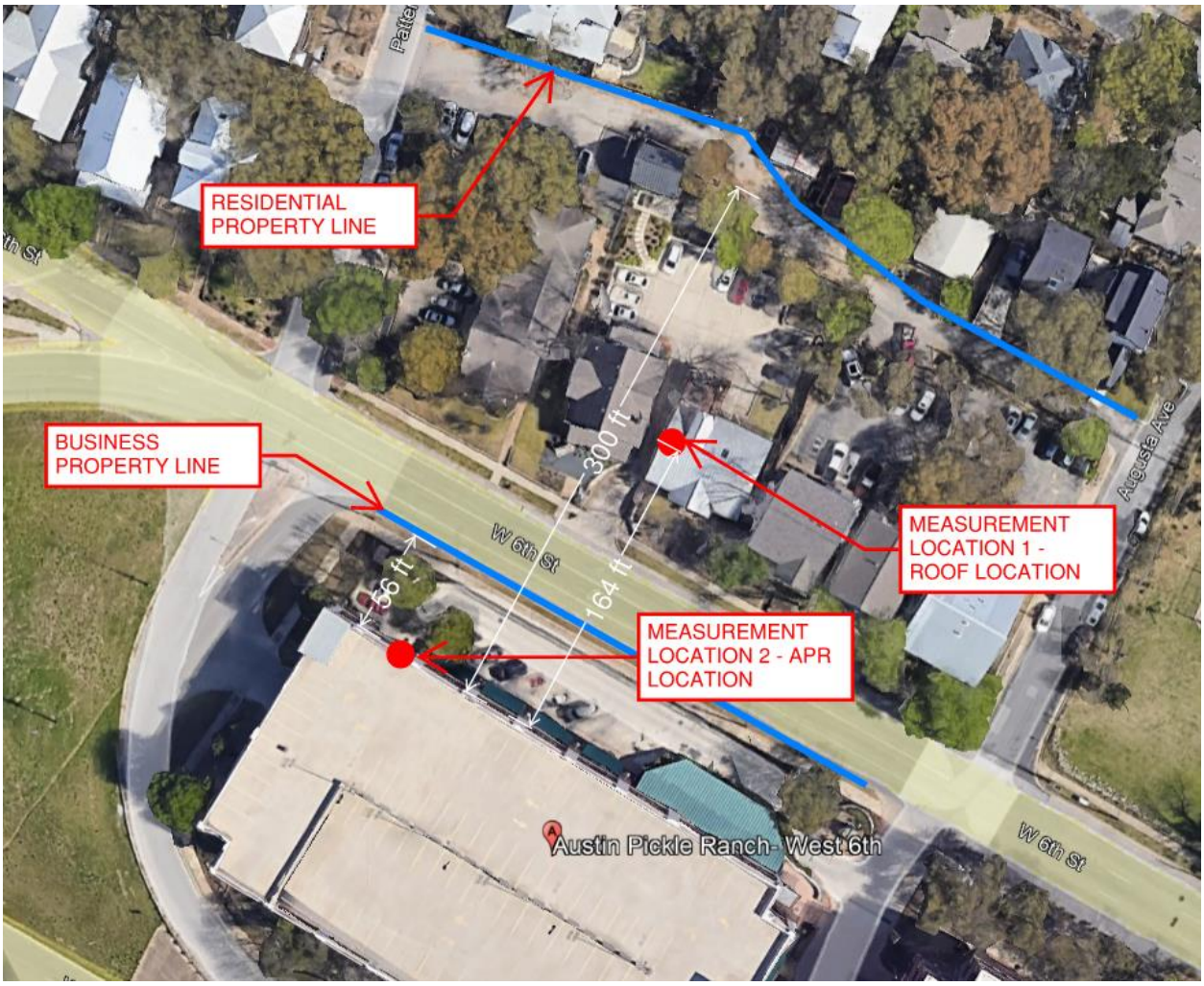


Figure 2. Measurement locations relative to the pickleball venue, pickleball business property line, and residential property line are shown in this satellite image from Google Earth. Note the distances of 164 feet from the venue to the first measurement location and about 300 feet from the venue to the residential property line.

THE CODE OF THE CITY OF AUSTIN, TEXAS

The part of the code that is used to outline the information presented below is:

The Code of the City of Austin, Title 9 – Prohibited Activities, Chapter 9-2 – Noise and Amplified Sound, Article 1. – General Provisions.

With reference to the city code, the items and activity that produces the noise in question associated with pickle ball are a person holding a paddle and striking a ball. The collective equipment and activity would be considered “Sound Equipment” as defined by the code, since the paddle and ball produce a sound. Pertinent “Noise and Amplified Sound” restrictions are reproduced below, for easy reference, but these may be referenced in their original location on the Municode Library at https://library.municode.com/tx/austin/codes/code_of_ordinances.

In Title 9. – Prohibited Activities, 9-2-3 – General Restrictions:

“(A) A person may not:

(1) use or permit the use of sound equipment at a business in excess of the decibel limits prescribed by this chapter;

(2) make noise or play a musical instrument audible to an adjacent business or residence between 10:30 p.m. and 7:00 a.m.; ….”

In Title 9. – Prohibited Activities, 9-2-4 – Restriction on Decibel Level.:

“A person may not operate sound equipment at a business that produces sound:

(1) in excess of 85 decibels between 10:00 a.m. and 2:00 a.m., as measured at the property line of the business; or

(2) is audible at the property line of the business between 2:00 a.m. and 10:00 a.m.”

In Title 9. – Prohibited Activities, 9-2-5 – Restriction on Use of Sound Equipment in a Residential Area.:

“ (A) This section applies to property zoned as residential under Section 25-2-32(B) (Zoning Districts and Map Codes).

(B) A person may not use sound equipment that produces sound audible beyond the property line of a residence in a residential area between 10:00 p.m. and 10:00 a.m.

(C) A person may not use sound equipment audible beyond the property line of a residence in a residential area that produces sound in excess of 75 decibels.”

These are summarized in the table below.

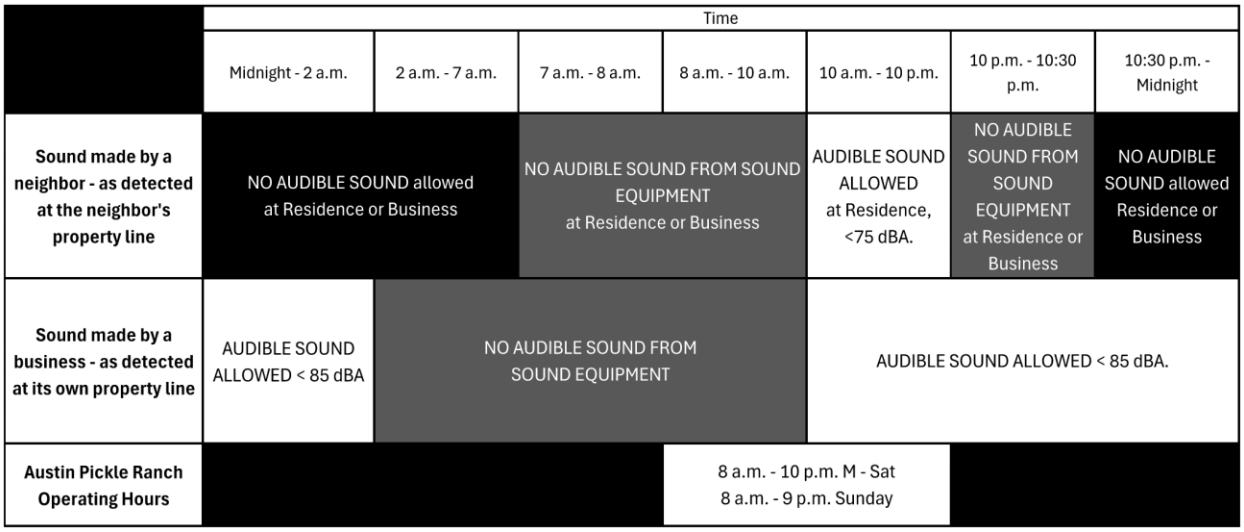


Figure 3. This table summarizes the City of Austin code related to noise at business and residential property lines.

MEASUREMENT AND EVALUATION RESULTS

Measurement Location 1, Roof Location:

The sound analyzer was set to automatically flag any instance of measured sound that exceeded 75 dBA. Overall, there were 466 instances from Thursday 4/18 at 2:14 p.m. (the start of measurements) through Monday 4/22 at 1:14 p.m. All 466 75-dBA-exceedances recorded were confirmed by listening to the audio recording as being produced by events that were not pickle ball strikes (for example, motorcycle, loud automobile, train, etc.). The most severe noise events were vehicular, especially the train. When the train passed by, the wheels squealed against the track and generated sound pressure levels well above 75 dBA [at the measurement location] in addition to generating feelable vibration.

Refer to Graph #1 and Graph #2, appended to this narrative (PDF pages 7 and 8). Pickleball strikes that were audible during the four-day monitoring period all registered below the residential property line limit of 75 dBA. Two graphs of selected 350-sample periods (one sample was recorded every second, so each period is 350 seconds) are included in the appendix to show examples of the typical pickleball sound levels as compared to all other sounds on site. Birds, the train, sirens, and traffic represent the other noise sources that are typically as high or higher than the sound from pickleball play. The graphs show representative measurement periods, to detail noise sources and the typical pickleball strike sound pressure levels. On each graph, the residential property line noise limit of 75 dBA is plotted as a bold, dashed line. The sound pressure level considering all frequencies for all site noise is plotted as a green curve. The green curve shows sound pressure levels frequency-weighted using the “A” weighting network and was measured with the sound analyzer set to use a “Fast” time constant. (These settings were used to compare directly to the sound level values presented in the Code. Using a Fast time constant gives higher sound pressure levels than the “Slow” time constant, which is also indicated as an acceptable measurement setting by the Code.) The sound pressure level limited to the frequencies generated by pickleball strikes is plotted as a red curve. Pickleball strikes are well-documented as generating all its sound within the 1,000 Hz octave

frequency band, and this is what is plotted here. While it shows sound filtered to only the pickleball strike frequency, it is important to note that all the other sound sources recorded also generate sound in that frequency range (though obviously of a different character and level). For example, bird songs and tires-on-road noise also contain frequencies in the 1,000 Hz octave band, and they contribute to the sound pressure level shown by the red curve.

An important note here also is that the measurement location, the peak of a pitched roof with an unobstructed view of the pickleball courts, is about 164 feet from the pickleball venue. The residential property line is about 300 feet from the venue. For all measured pickleball values graphed and reported, at the residential property line the sound pressure levels will be at least five (5) to six (6) decibels lower due to inverse square falloff with the increased distance. (I.e., the residential property line is about twice as far from the pickleball venue as the measurement location, so it will be about 5 dB quieter at the residential property line.) It is also worth noting that sound-blocking ("shadowing") of obstructions to the residential property lines, such as buildings along 6th Street, is not accounted for in the attenuating elements between the venue and the residential property lines.

Refer to Graph #3, appended to this narrative (PDF page 9). An overall graph of the measurement period (from Thursday 4/18 through Monday 4/22) is included here. The "fast, maximum" sound pressure levels are plotted (red curve) as well as the "equivalent" sound pressure levels, denoted "Leq" (green curve). Leq may be thought of as the average sound pressure level over time. As can be seen looking at the red curve, maximum sound pressure levels recorded at this site commonly exceed 75 dBA, with some reaching 90 or more, even overnight. It is very important to note the daily trend of the Leq curve. The general trend is that the weekday average levels begin to rise every morning at about 6 a.m. They rise steeply until 8 a.m., when they transition to a slow rise until about noon. From noon to about 6 p.m., the average daily levels are relatively equal, and then they start to drop from 6 p.m. through about 4 a.m. The weekend days are slightly different, with the trend shifting to later by about 2 hours and Sunday being the quietest. What is notable is that, while the pickleball sound stays at the same sound pressure level, the background noise on the site changes throughout the day and from day to day. When the site noise starts to fall off (starting around 6 p.m.), the pickleball noise will become somewhat more noticeable above the [reducing] site noise until the venue closes at 10 p.m.

Measurement Location 2, Garage Location:

The measurements at this location were used to calculate the sound pressure level at the business's property line. Pickleball strikes during the monitoring period all registered 81 dBA or less.

As indicated below, the 8 a.m. to 10 a.m. venue hours are a time block where additional attenuation of pickleball noise is required to ensure inaudibility.

8 A.M. – 10 A.M. AUDIBILITY

The venue opens at 8 a.m. Pickleball strikes were audible from 8 a.m. to 10 a.m. at both measurement locations. In order to reduce strikes to an inaudible level at the property lines, they would have to be attenuated to a level that is about 10 dB below the average site noise level during play. A sound barrier is necessary to block the 1,000 Hz frequency. The highest sound pressures of pickle ball strikes were calculated to be about 65 dBA at the residential

property line and 81 dBA at the business property line. Average background sound pressure levels indicate a 10 dB overall mitigation strategy would result in effective sound control.

CONCLUSION

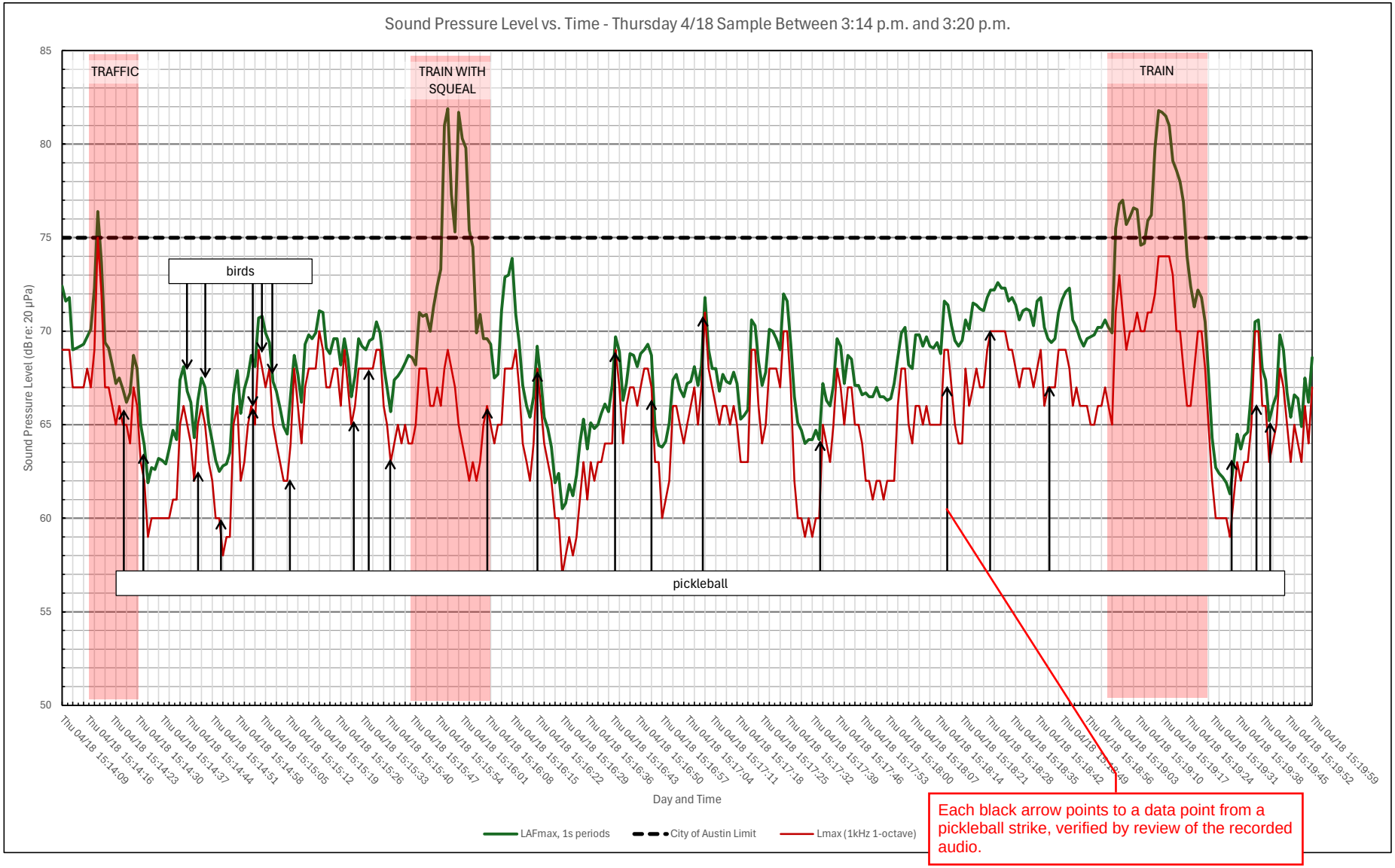
The sound pressure levels generated by pickle ball play at The Austin Pickle Ranch comply with The Code of the City of Austin Title 9 requirements between the hours of 10 a.m. and 8 a.m. (22 hours of the day). Between the hours of 8 a.m. and 10 a.m. (2 hours of the day), pickle ball play at The Austin Pickle Ranch is occasionally audible at neighboring residential property lines.

RECOMMENDATION

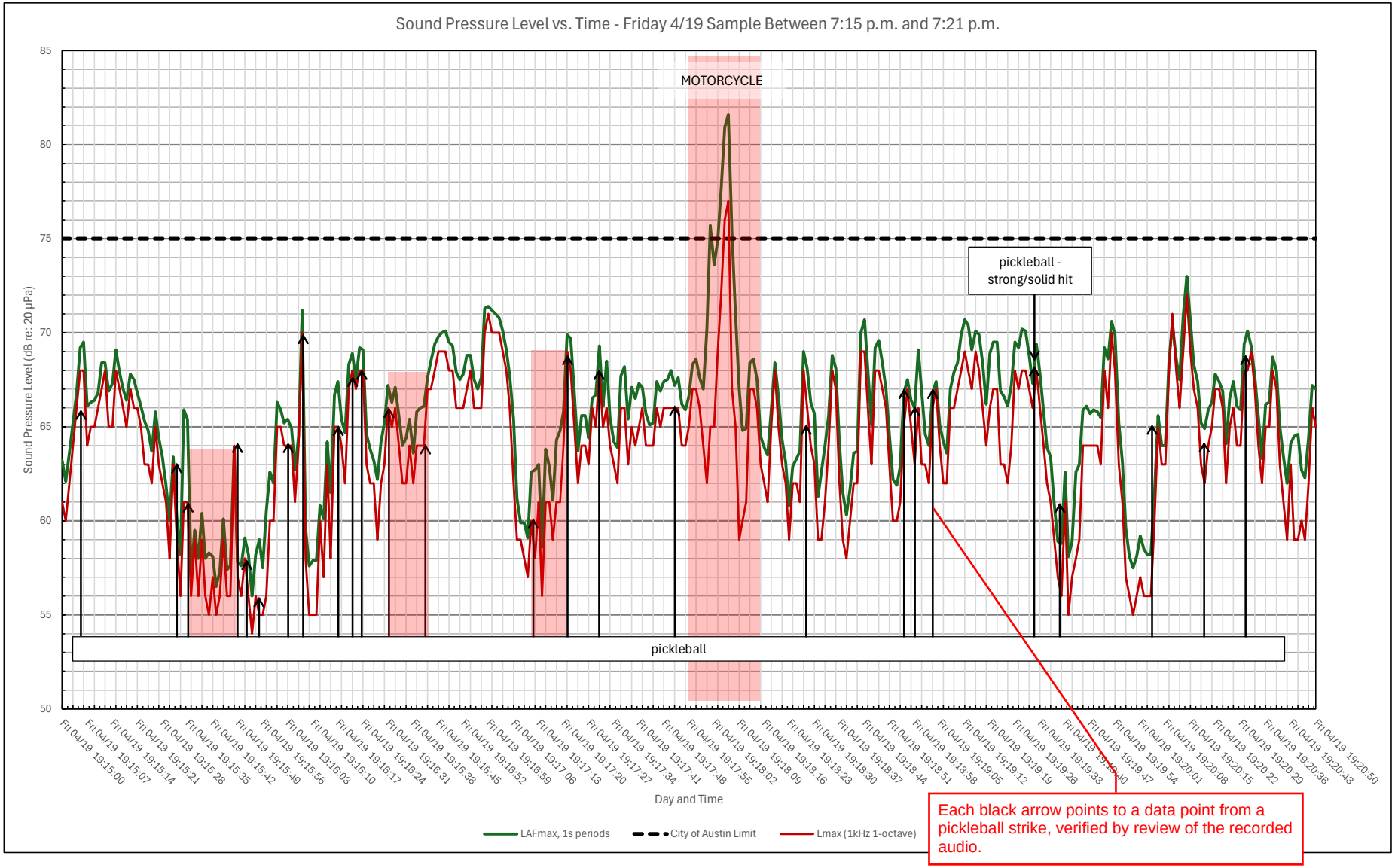
To further reduce sound from Austin Pickle Ranch between 8 a.m. and 10 a.m., a supplemental sound barrier is recommended. A 7-foot-tall (minimum) sound barrier (as measured from the garage roof floor or pickleball court surface) will provide additional attenuation of 10 dB at 1,000 Hz, which would meet the needed additional attenuation to reduce the highest-sound-pressure-level pickle ball strikes to an inaudible level. This sound barrier can be any material with lab-measured transmission loss of 10 dB or more in the 1,000-Hz third-octave band. A ½-pound-per-square-foot mass-loaded vinyl material would be easy to fasten to the existing garage parapet structure and provides about 20 dB of transmission loss at 1,000 Hz. This material is recommended. Many manufacturers offer such a product – SoundSeal, Kinetics Noise Control, and many others. A reinforced, outdoor-rated version of the product offering should be used.

-End of Memo-

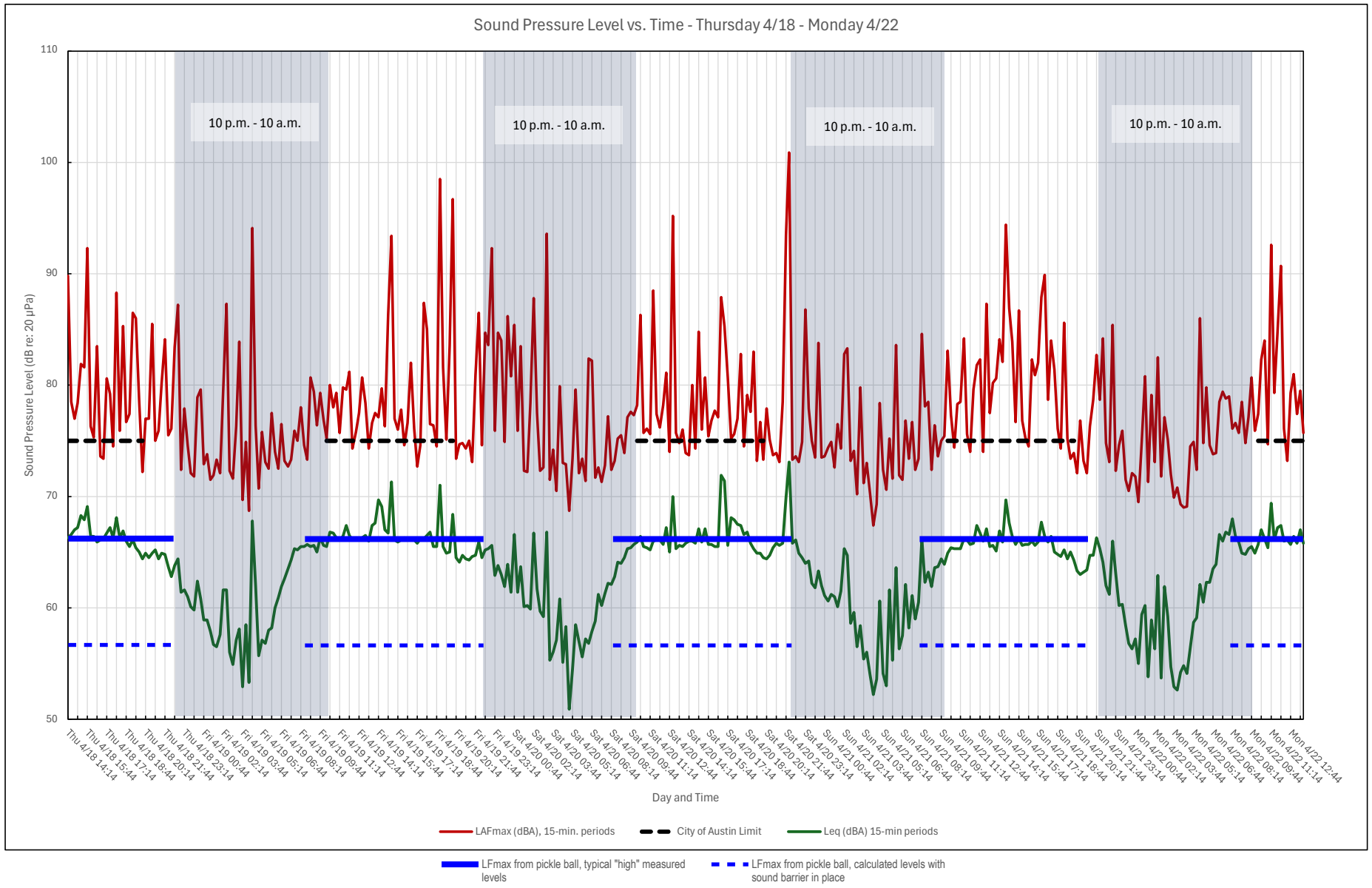
GRAPH #1


Sound Pressure Level vs. Time - Thursday 4/18 Sample Between 3:14 p.m. and 3:20 p.m.
TRAFFIC
TRAIN WITH SQUEAL
TRAIN
birds
pickleball
Sound Pressure Level (dB re: 20 µPa)
85
80
75
70
65
60
55
50
Day and Time
LAFmax, 1s periods
City of Austin Limit
Lmax (1kHz 1-octave)
Each black arrow points to a data point from a pickleball strike, verified by review of the recorded audio.

GRAPH #2


Sound Pressure Level vs. Time - Friday 4/19 Sample Between 7:15 p.m. and 7:21 p.m.
Sound Pressure Level (dB re: 20 µPa)
85
80
75
70
65
60
55
50
MOTORCYCLE
pickleball - strong/solid hit
pickleball
Day and Time
LAFmax, 1s periods
City of Austin Limit
Lmax (1kHz 1-octave)
Each black arrow points to a data point from a pickleball strike, verified by review of the recorded audio.

GRAPH #3


Sound Pressure Level vs. Time - Thursday 4/18 - Monday 4/22
10 p.m. - 10 a.m.
10 p.m. - 10 a.m.
10 p.m. - 10 a.m.
10 p.m. - 10 a.m.
Sound Pressure Level (dB re: 20 µPa)
110
100
90
80
70
60
50
Day and Time
LAFmax (dBA), 15-min. periods
City of Austin Limit
Leq (dBA) 15-min periods
LFmax from pickle ball, typical "high" measured levels
LFmax from pickle ball, calculated levels with sound barrier in place

Light Study

The rendering below shows the amount of light being directed onto the surface below. This rendering was performed by Frasure Reps, LLC. and clearly shows there are zero foot-candles (0 FC) of light off-site.

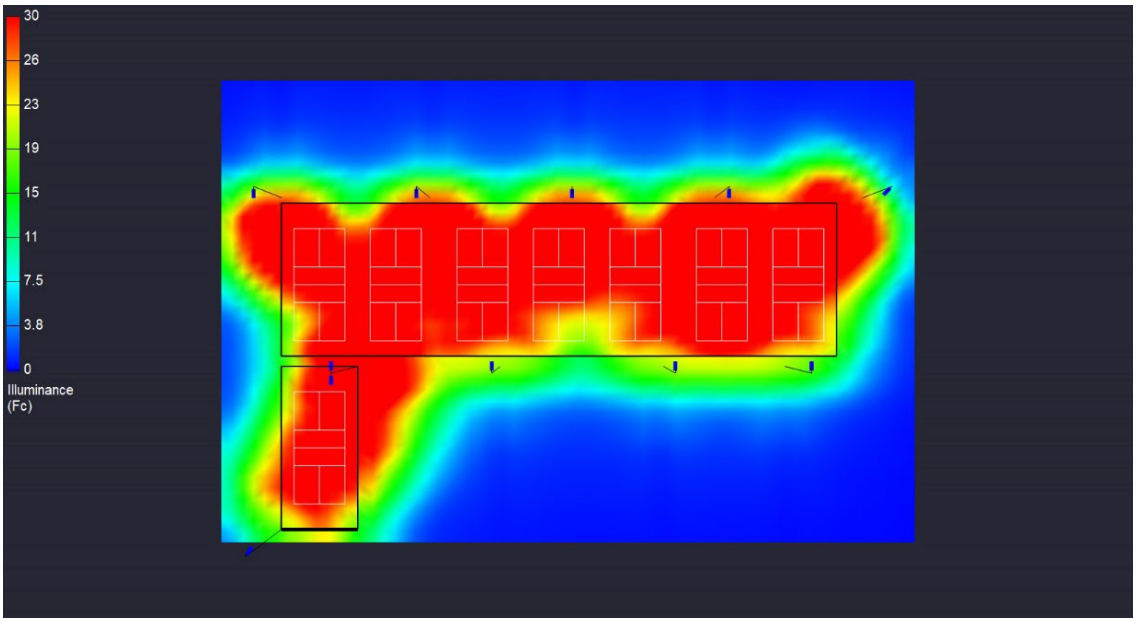
Foot-Candles are a measure of the amount of light on any given surface (see attachments)

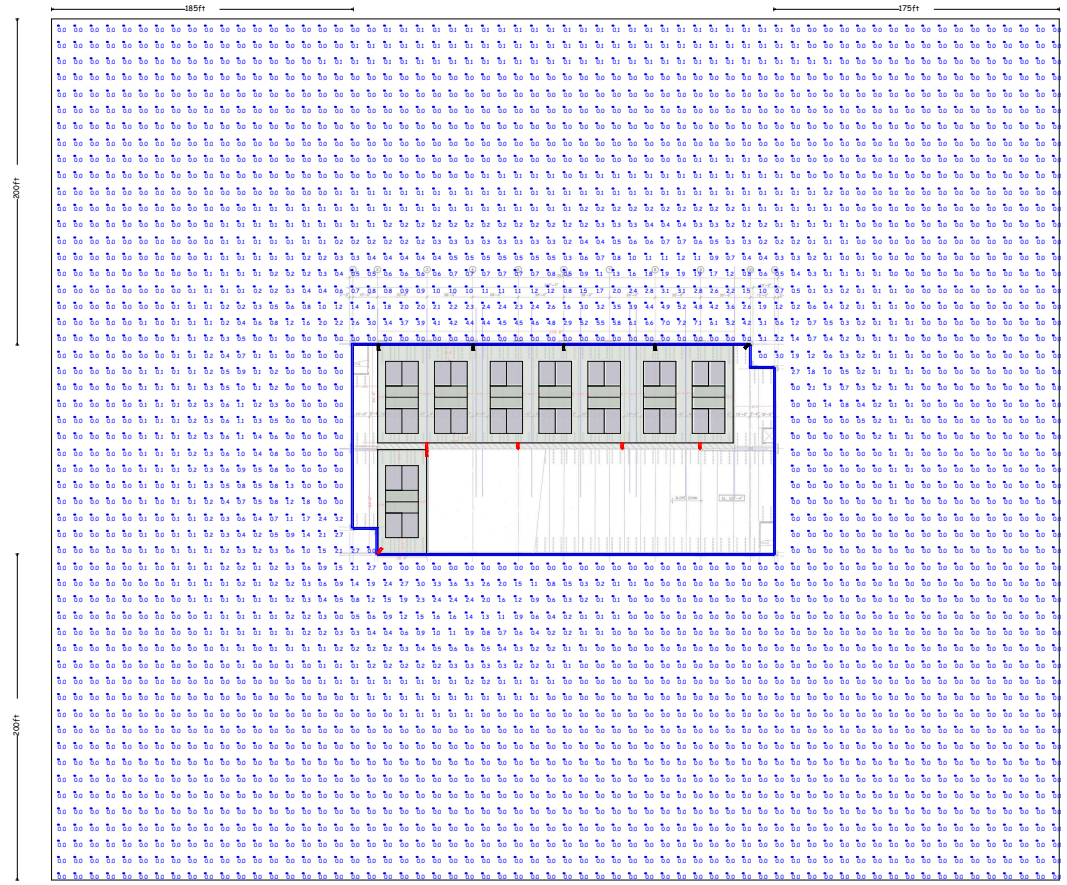
1. **Heat Map (below – light levels on site)**
2. **Spill Readings (page 2 – light levels off site)**

These renderings and calculations were performed using AGI32.

AGi32 is a simulation tool used for designing lighting projects and calculating the amount of light that will be delivered based on user-set parameters. The resulting calculations are commonly referred to as lighting layouts.

1. The lighting design was performed using criteria set forth by the Illuminating Engineer Society (IES) and meets all requirements on and off site.
2. Austin Pickle Ranch has installed light shields on the LED light fixtures to reduce off-site visibility of light sources.
3. Austin Pickle Ranch installed a product supplied by the leader in tennis and pickleball lighting solutions nationwide (LSI industries).





SPILL
Z = -38

Luminaire Schedule								
Project: HARTLAND PICKLE RANCH / AUSTIN PICKLE RANCH								
Symbol	Qty	Label	Arrangement	Description	LLF	Luminaire Lumens	Luminaire Watts	Total Watts
	4	A1 - REAR SHIELD	Single	ZNL-78L-CT-50-EHS-B-60 (ZONE LARGE) @ 28' MTG. HT.	0.940	78582	648	2592
	5	A2 - REAR SHIELD	Single	ZNL-78L-CT-50-EHS-B-60 (ZONE LARGE) @ 23' MTG. HT.	0.940	78582	648	3240
	1	B1 - REAR SHIELD	TWIN 180	ZNL-78L-CT-50-EHS-B-60 (ZONE LARGE) @ 28' MTG. HT.	0.940	78582	648	1296

Project: Austin Pickle Ranch
Location: Austin, TX

Frasure Reps
3343 Lookout Drive
Cincinnati, OH 45208
Phone: 513-666-4242
Email: patrick@frasurereps.com

FRASUREREPS
SPORTS LIGHTING

Date:5/29/2024

DRAFT EXHIBIT "G" – September 24, 2024 (Response to OWANA) SITE DEVELOPMENT STANDARDS

Section 1. Applicable Site Development Regulations

A. If there is a conflict between this Ordinance and applicable City of Austin rules, regulations and Ordinances, this Ordinance including the Exhibits shall control.

Section 2. Authorized Uses

A. All Commercial Services (CS) uses are permitted uses of the Property except as provided herein. The following are additional permitted uses:

1. Condominium Residential
   a. 10% of the total units provided onsite shall be reserved as affordable at 80% MFI for the Austin-Round Rock Metropolitan Statistical Area.
   b. Eliminate fee in lieu of to meet affordability goals of the city for the 10% requirement in Section 2.A.1.a.
2. Townhouse Residential
   a. 10% of the total units provided onsite shall be reserved as affordable at 80% MFI for the Austin-Round Rock Metropolitan Statistical Area.
   b. Eliminate fee in lieu of to meet affordability goals of the city for the 10% requirement in Section 2.A.2.a.
3. Multi-Family Residential
   a. 10% of the total units provided onsite shall be reserved as affordable at 80% MFI for the Austin-Round Rock Metropolitan Statistical Area.
   b. Eliminate fee in lieu of to meet affordability goals of the city for the 10% requirement in Section 2.A.3.a.
4. Outdoor Sports and recreation use shall a permitted use on the fourth floor of the existing parking garage subject to the following regulations:
   a. Outdoor Sports and Recreation uses shall be limited to 25,000 SF.
   b. General Outdoor lighting: Landowner shall comply with the City's Dark Sky regulations for all buildings on the Property as follows:
      - Use of low Kelvin rated lights (3000 Kelvin or less) for outdoor lighting;
      - Outdoor light shall be fully shielded so that any light source visible from the residential homes north of W. 6th street will be shielded on all four sides of the fixture;
      - Exterior lighting may not exceed 0.0 foot candles beyond W. 6th Street.
      - Focus light on activity and use activity appropriate lighting.
   c. The hours of operation for outdoor sports and recreation shall be limited to 8 AM – 10 PM.
   d. Public address systems or personal sound equipment are not permitted.
   e. A ten (10) foot sound barrier shall be installed along the entire northern building façade facing 6th Street and the entire western building facing Mopac. The sound barrier shall be built to the following standards:
      1. The sound barrier shall be a continuous material from grade level of the court vertically 10-ft tall – not mounted atop the existing perimeter barrier wall.
      2. The sound barrier shall be 1 pound per square foot or greater to reduce noise. The sound barrier does not need a more expensive sound absorbing liner on the court side.
      3. The sound barrier should be compatible with the architectural requirements of the surrounding area.
   f. All customers must park in the existing parking garage on the Property. Parking for customers shall be available at a reduced rate to alleviate parking on the neighborhood streets.

g. Outdoor sports and recreation may not resume operations until:
   1. The sound barrier and outdoor lighting is installed in accordance with the above conditions and certified by an acoustic consultant and lighting consultant.
   2. All applicable permits and approvals are obtained as required by the City of Austin, including but not limited to all zoning related approvals, building and/or trade permits, and certificates of occupancy.

5. If the existing parking garage is modified to add additional floors outdoor sports and recreation shall not be permitted on the new rooftop. Outdoor sports and recreation use may be permitted at a lower floor as long as it is separated from W. 6th Street and the western property line by a solid wall or a 10-ft sound barrier as described in Section 4.e.

6. The Property may include no more than one (1) cocktail lounge which shall be limited to 7,500 SF. The 7,500 square footage limitation shall include all required gross square footage for storage, accessibility, service, restrooms, etc. as required by City Code for the cocktail lounge use. Cocktail Lounge use is prohibited in the existing and modified parking garage structure and prohibited in the ground floor space fronting W. 6th Street. All entrances to a cocktail lounge use will be from Campbell Street or West 5th Street.

7. If an outdoor venue (deck, patio, etc.) is proposed for the commercial space in the project, such outdoor space shall not be included in any outdoor music venue permit. It is the intention of this provision that amplified, or percussion sound be prohibited regardless of whether an outdoor sound permit is sought.

8. If the existing parking garage is modified to add additional floors, the rooftop space of the modified structure shall not be open to the public and shall be made available only to existing tenants of the building for passive activities including, but not limited to, eating or sitting outside.

B. Indoor Crop Production shall be a conditional use of the Property.

C. The following uses are prohibited as principal uses of the Property:
Adult-Oriented Business
Agricultural Sales and Services
Alternative Financial Services
Automotive Rentals
Automotive Repair Services
Automotive Sales
Automotive Washing (of any type)
Bail Bond Services
Bed & Breakfast (Groups 1 & 2)
Building Maintenance Services
Campground
Construction Sales and Services
Convenience storage
Drop-off recycling collection facility
Electronic Prototype Assembly
Equipment Repair Services
Equipment Sales
Exterminating services
Funeral Services
Kennels
Laundry Services

Limited Warehousing and Distribution
Monument Retail Services
Outdoor Entertainment
Pawn Shop Services
Research Services
Short Term Rentals
Service Station
Custom Manufacturing
Limited Warehousing and Distribution

Section 3. Site Development Regulations

Base District Regulations

The maximum building height on the Property is 90-FT plus additional height limit exceptions in Section 25-2-531 (*Height Limit Exceptions)*.

The maximum floor-to-area ratio on the Property is 2:1.

Section 25-6-471(*Off-Street Parking Facility Required)* is modified to require a minimum of 530 parking spaces to be provided onsite.

Section 4. Community Benefits

1. Residents within the Old West Austin Neighborhood Planning Area may utilize the existing first floor coworking space at a 50% discount.
2. The first floor conference room may be used by OWANA, as available, free of charge.
3. Should the City of Austin or a non-profit corporation initiate improvements to the Johnson Creek Trail, the Property owner will contribute 25% of the total project cost towards improvements to the Johnson Creek trail from West 5th Street to the Butler Trail, up to $250,000.00.
4. The landowner will use commercially reasonable efforts to work with the City of Austin Transportation and Public Works Department to restrict turning onto W. 6th Street from the western exit out of the existing parking garage.