

ZONING CHANGE REVIEW SHEET

CASE: C14-2023-0038.SH

DISTRICT: 1

ADDRESS: 4106 ½, 4120, 4122, 4122 ½ E. 12th Street

ZONING FROM: SF-3-NP

TO: MF-2-NP

SITE AREA: approximately 3.44 acres (approximately 149,846 sq. ft.)

PROPERTY OWNER: 4120 E 12th Street Partners LP

AGENT: Drenner Group, PC (Leah M. Bojo)

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

STAFF RECOMMENDATION:

Staff supports the Applicant's request for rezoning to MF-2-NP.

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

PLANNING COMMISSION or ZONING AND PLATTING COMMISSION ACTION / RECOMMENDATION:

September 14, 2023: Case is scheduled to be heard by Planning Commission

CITY COUNCIL ACTION:

N/A

ORDINANCE NUMBER:

N/A

ISSUES:

The subject tract is immediately adjacent to a historic cemetery that dates to the 1800s. Neighbors have expressed concerned about the possibility of graves being located outside the property lines of the cemetery and possibly located within the bounds of the tract seeking rezoning for development.

The applicant has committed to constructing 40% of the units affordable to households at 80% MFI.

CASE MANAGER COMMENTS:

The rezoning tract is located northwest of the intersection of East 12th Street and Springdale Road; the undeveloped property is zoned SF-3-NP. To the east of the property is a small retail center that is zoned GR-MU-NP. Immediately west of the rezoning tract is developed SF-3-NP property. To the south of the property are four single family lots developed with single family residential land use. Immediately north and east of the rezoning tract is Bethany

Cemetery, which is zoned P-NP and two single family homes on the cul-de-sac of Waldorf Avenue.

The adjacent cemetery, Bethany Cemetery, is a privately owned, historically African American cemetery established in the 1800s. Bethany Cemetery was designated a Historic Texas Cemetery in 2003. The applicant is working with the Texas Historical Commission to verify the history and boundaries of the cemetery. The applicant has provided documentation regarding this ongoing process including a ground penetrating radar (GPR) survey conducted in May of 2021 *please see Exhibit D*.

If any graves are located within the boundaries of the rezoning tract the property owner will be responsible for relocating the graves.

Census Tract 21.09 (MLK South) is identified in the UT Uprooted Gentrification Study as having a vulnerable population, an accelerating housing market type, and categorized as an Early: Type One Gentrification Type.

BASIS OF RECOMMENDATION:

- 1. The proposed zoning should be consistent with the goals and objectives of the City Council.*
- 2. The rezoning should be consistent with the policies and principles adopted by the City Council or Planning Commission.*
- 3. Zoning should promote clearly identified community goals, such as creating employment opportunities or providing for affordable housing.*

The rezoning would allow development of the property with both market rate and income restricted affordable multifamily residential units. The Strategic Housing Blueprint, adopted by Council in 2017, promotes additional affordable housing across the city. Imagine Austin also seeks to increase development in Imagine Austin Centers and along Imagine Austin Corridors. Springdale Road is an Imagine Austin Corridor. Capital Metro services 12th Street with the #5 Bus, and Springdale with the #300 Bus. This area is proximate (approximately 1 mile) to three Imagine Austin Centers: Mueller Station, Springdale Station and MLK Station.

EXISTING ZONING AND LAND USES:

	ZONING	LAND USES
<i>Site</i>	SF-3-NP	Vacant land
<i>North</i>	P-NP and SF-3-NP	Bethany Cemetery and two single family homes on Waldorf Avenue
<i>South</i>	SF-6-NP and GR-MU-NP	Four single family homes (north of 12 th Street) and approximately 24 townhomes (south of 12 th Street)
<i>East</i>	GR-MU-NP and GR-MU-V-NP	Shopping center, approximately 5,000 square feet, and an abandoned/vacant 4plex, approximately 2,000 square feet built in 1960.

<i>West</i>	SF-3-NP and SF-6-NP	Eleven residential structures, a mix of single family homes and duplexes, and one vacant lot
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NEIGHBORHOOD PLANNING AREA: East MLK Combined Neighborhood Planning Area (MLK)

WATERSHED: Tannehill Branch

SCHOOLS: A.I.S.D.

Norman-Sims Elementary School

Martin Middle School

Northeast High School

COMMUNITY REGISTRY LIST:

Austin Independent School District, Austin Lost and Found Pets, Austin Neighborhoods Council, Del Valle Community Coalition, East Austin Conservancy, East MLK Combined Neighborhood Plan Contact Team, Friends of Austin Neighborhoods, Friends of Northeast Austin, Homeless Neighborhood Association, Martin Luther King Neighborhood Association, Neighborhood Empowerment Foundation, Neighbors United for Progress, Preservation Austin, Residents of E 12th St, SELTexas, Sierra Club, Austin Regional Group

AREA CASE HISTORIES:

Number	Request	Commission	City Council
C14-2020-0014 (Twelve Springdale Residences)	The Applicant is proposing to rezone 1200, 1202, and 1208 Springdale Road from GR-MU-NP to GR-MU-V-MP. Case was withdrawn by the applicant on 02.05.2020	N/A	N/A
C14-2020-0089 (Twelfth and Springdale Residences) 4100 E. 12 th St. and 1200, 1202, and 1208 Springdale Rd.	The Applicant is proposing to rezone approximately 1.47 acres from GR-MU-NP to GR-MU-V-NP, as amended.	05.25.2021 PC: Approved GR-MU-V-NP as staff recommended. PC supports 10% of units at 60% MFI, as offered by the applicant. Approved on a motion by Commissioner Cox, seconded by Commissioner Mushtaler on a vote	07.29.2021: Approved GR-MU-V-NP on first reading only motion by Mayor Pro Tem Harper-Madison's motion and Council Member Pool's second on a 10-0 vote. Council Member Kelly was off the dais.

		of 9-1. Commissioner Praxis voted nay.	08.26.2021: Ordinance No. 20210826-097 was approved on 2 nd and 3 rd Readings for GR- MU-V-NP on Mayor Pro Tem Harper- Madison's motion and Council Member Kitchen's second on a 10-0 vote. Council Member Alter abstained.
C14H-2008-0036 (Volma and Warneta Overton House)	The applicant is proposing a zoning change from SF-3- NP to SF-3-H-NP.	12.09.2008 PC: Approved staff recommendation of SF-3-H-NP on consent (8-0).	12.18.2008: Approved Ordinance 20081218-106 for SF-3-H-NP (6-0) on all 3 readings.
C14-2020-0135.SH (Lott Avenue)	The Applicant is proposing to rezone approximately 5.01 acres from SF-3-NP to SF-6-NP.	02.09.2021 PC: Approved staff recommendation of SF-6-NP. Motion by Vice-Chair Hempel, seconded by Commissioner Connolly was approved on a vote of 8-0. Commissioners Llanes Pulido, Schneider and Shieh abstained. Two vacancies on the Commission.	04.22.2021: Approved Ordinance No. 20210422-045. SF-6-NP on Council Member Renteria's motion, Mayor Pro Tem Harper- Madison's second on an 11-0 vote. On all 3 readings.

RELATED CASES:

C14-2000-0003 (Twelve Springdale Residences) Previous Rezoning Case 4120 E. 12th St.
The Applicant proposed to rezone 3.4376 acres from SF-3-NP to MF-6-NP. Withdrawn

ADDITIONAL STAFF COMMENTS:

Comprehensive Planning

Project Name and Proposed Use: 4120 E 12TH ST. C14-2023-0038.SH. Project: 4106 1/2, 4120, 4122, 4122 1/2 E. 12th Street. 3.44 acres from SF-3-NP to MF-1-NP. EMLK Combined NP. FLUM: Mixed Residential. 244 multifamily units. 40% of units will be affordable to households at 80% of the regional Median Family Income. Additionally, the project intends to participate in Affordability Unlocked. This parcel is part of a broader redevelopment with the Property's adjoining parcels consisting of 592 units in total.

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. Name(s) of Activity Center/Activity Corridor/Job Center: 250 ft. off the Springdale Road Activity Corridor
Y	Mobility and Public Transit: Located within 0.25 miles of public transit stop and/or light rail station.
Y	Mobility and Bike/Ped Access: Adjoins a public sidewalk, shared path, and/or bike lane.
	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.
	Connectivity and Education: Located within 0.50 miles from a public school or university.
Y	Connectivity and Healthy Living: Provides or is located within 0.50 miles from a recreation area, park or walking trail.
	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.)
Y	Housing Affordability: Provides a minimum of 10% of units for workforce housing (80% MFI or less) and/or fee in lieu for affordable housing.
Y	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.
	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.)
	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.
6	Total Number of "Yes's"

Environmental

1. The site is not located over the Edwards Aquifer Recharge Zone. The site is located in the Tannehill Branch Watershed of the Colorado River Basin, which is classified as an Urban Watershed by Chapter 25-8 of the City's Land Development Code. It is in the Desired Development Zone.
2. Zoning district impervious cover limits apply in the Urban Watershed classification.
3. According to floodplain maps there is no floodplain within or adjacent to the project location.
4. Standard landscaping and tree protection will be required in accordance with LDC 25-2 and 25-8 for all development and/or redevelopment.

5. At this time, site specific information is unavailable regarding vegetation, areas of steep slope, or other environmental features such as bluffs, springs, canyon rimrock, caves, sinkholes, and wetlands.

6. This site is required to provide on-site water quality controls (or payment in lieu of) for all development and/or redevelopment when 8,000 s.f. cumulative is exceeded, and on site control for the two-year storm.

7. At this time, no information has been provided as to whether this property has any preexisting approvals that preempt current water quality or Code requirements.

PARD – Planning & Design Review

PR1: Parkland dedication will be required at the time of subdivision or site plan application for new residential units, per City Code § 25-1-601, as amended. The proposed development meets the criteria for land dedication in City Code Title 25, Article 14. As such, a partial land dedication will be required, as well as any remaining fees in-lieu.

The development as proposed will require parkland dedication for the new residential units, as well as serve the surrounding neighborhood through the additional park investment. The Parks and Recreation Department (PARD) would consider a connection to Bethany Cemetery and Givens District Park toward satisfying the requirement at time of permitting (whether subdivision or site plan). Such a connection would improve neighborhood connectivity to parks, a criterion for parkland dedication.

Should there be any remaining fees in-lieu, those fees shall be used toward park investments in the form of land acquisition and/or park amenities within the surrounding area, per the Parkland Dedication Operating Procedures § 14.3.11 and City Code § 25-1-607 (B)(1) & (2).

Please note that residential units that are certified affordable under the SMART Housing Policy are exempt from the parkland dedication requirements per City Code § 25-1-601(C)(3). Parkland dedication will only be required for any new market-rate residential units proposed by this development.

Should the applicant wish to discuss parkland dedication requirements in advance of site plan or subdivision applications, please contact this reviewer: thomas.rowlinson@austintexas.gov.

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. FYI: Additional design regulations will be enforced at the time a site plan is submitted.

SCREENING REQUIREMENTS

SP5. FYI: Screening is required for off-street parking, the placement of mechanical equipment, storage, and refuse collection if a person is constructing a building (25-2-1066).

COMPATIBILITY STANDARDS

SP6. The site is subject to compatibility standards due to adjacency of SF-3-NP to the north, south and west. The following standards apply:

- No structure may be built within 25 feet of the property line.
- No parking or driveways are allowed within 25 feet of the property line.
- Landscaping or screening is required along the west and north property lines in accordance with the screening requirements (Section 25-2-1006 and ECM 2.9.1.), Parking Design Standards (Section 25-6-563) and/or Screening Standards (Section 25.2.1066) to screen adjoining properties from views of parking, mechanical equipment, storage, and refuse collection.
- An intensive recreational use, including a swimming pool, tennis court, ball court, or playground, may not be constructed 50 feet or less from property in an SF-5 or more restrictive zoning district.
- A landscape area at least 25 feet in width is required along the property line if the tract is zoned LR, GO, GR, L, CS, CS-1, or CH.

RESIDENTIAL DESIGN STANDARDS OVERLAY

SP7. The site is subject to 25-2 Subchapter F. Residential Design and Compatibility Standards.

Transportation and Public Works Department Review

ATD 1. Assessment of required transportation mitigation, including the potential dedication of right of way and easements and participation in roadway and other multi-modal improvements, will occur at the time of site plan application. The traffic impact analysis for this site is not required, the traffic generated by the proposal does not exceed the thresholds established in the City of Austin Land Development Code. [LDC 25-6-113].

ATD 2. The Austin Strategic Mobility Plan (ASMP) calls for 84 feet of right-of-way for E 12TH ST. It is recommended that 42 feet of right-of-way from the existing centerline should be dedicated for E 12TH ST according to the Transportation Plan with the first subdivision or site plan application. [LDC 25-6-51 and 25-6-55]

EXISTING STREET CHARACTERISTICS:

Name	ASMP Classification	ASMP Required ROW	Existing ROW	Existing Pavement	Sidewalks	Bicycle Route	Capital Metro (within 1/4 mile)
E 12 th Street	Local Mobility – Level 2	84 feet	79 feet	41 feet	Existing 4 feet sidewalks	On-street	Yes

						bike lane	
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TIA: Deferred to the time of Site Plan

Austin Water Utility

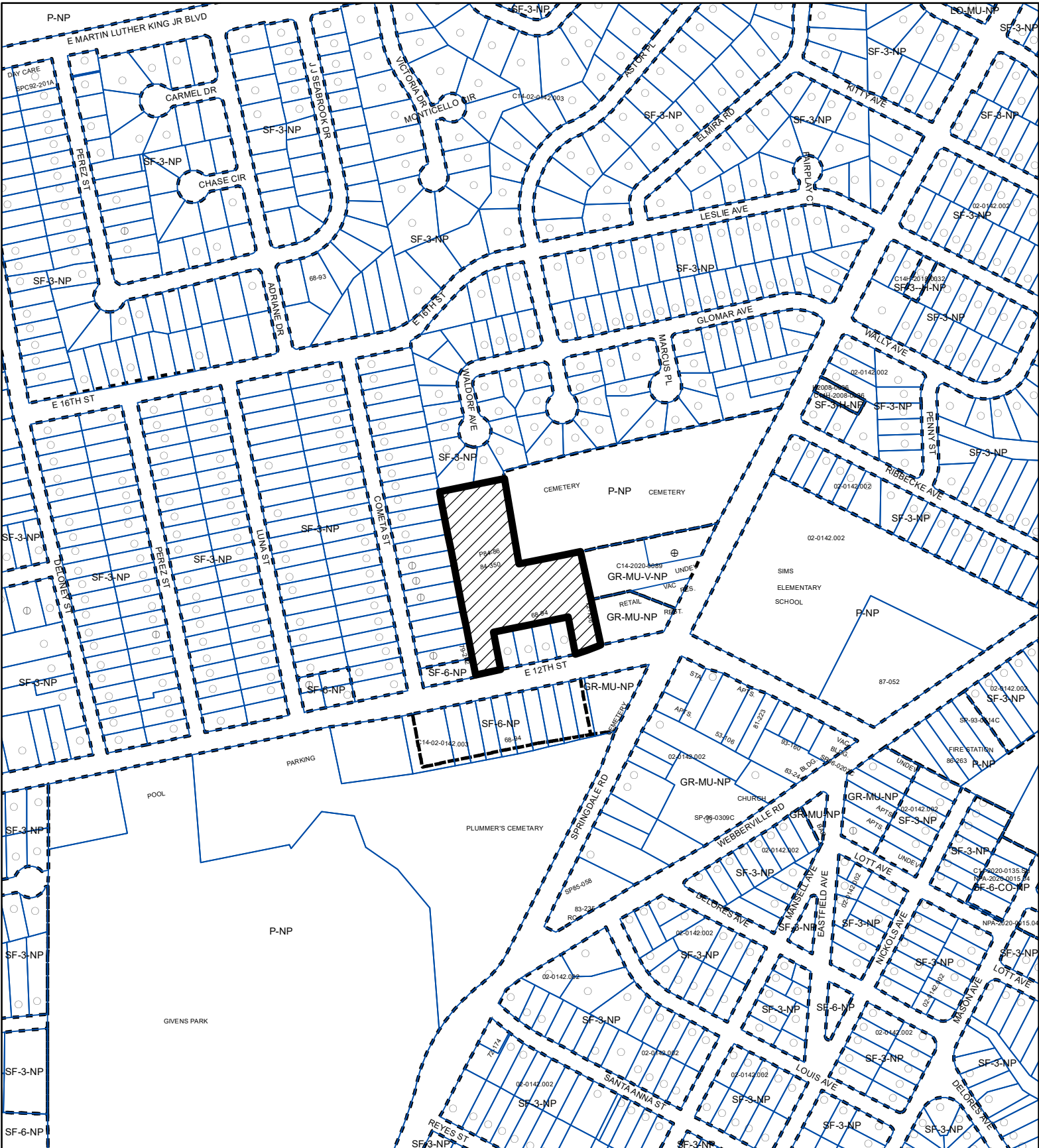
WW1. The landowner intends to serve the site with City of Austin water and wastewater utilities. The landowner, at own expense, will be responsible for providing any water and wastewater utility improvements, offsite main extensions, utility relocations and or abandonments required by the land use. The water and wastewater utility plan must be reviewed and approved by Austin Water for compliance with City criteria and suitability for operation and maintenance.




Depending on the development plans submitted, water and or wastewater service extension requests may be required. All water and wastewater construction must be inspected by the City of Austin.

The landowner must pay the City inspection fee with the utility construction. The landowner must pay the tap and impact fee once the landowner makes an application for a City of Austin water and wastewater utility tap permit.

INDEX OF EXHIBITS AND ATTACHMENTS TO FOLLOW:

- A. Zoning Map
- B. Aerial Map
- C. Applicant's Summary Letter
- D. ACI Consulting Ground Penetrating Radar (GPR) Survey (May 2021)
- E. Correspondence from Interested Parties



-  SUBJECT TRACT
-  PENDING CASE
-  ZONING BOUNDARY

ZONING

ZONING CASE#: C14-2023-0038.SH



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.

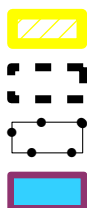
This product has been produced by the Housing and Planning Department for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or

1" = 400'

Created: 3/27/2023



4120 E. 12th Street



SUBJECT TRACT

ZONING BOUNDARY

PENDING CASE

CREEK BUFFER

ZONING CASE#: C14-2023-0038.SH

LOCATION: 4106 1/2, 4120, 4122,
4122 1/2 E 12th St

SUBJECT AREA: 3.44 Acres

GRID: L23

MANAGER: Jonathan Tomko



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

Created: 4/27/2023

July 14, 2023

Laura Middleton-Pratt
Planning Department
City of Austin
1000 E 11th Street
Austin, TX 78702

Via Electronic Delivery

Re: 4120 E. 12th Street – Rezoning application for the approximately 3.44-acre piece of property located at 4106 ½, 4120, 4122, and 4122 ½ E. 12th Street in the City of Austin, Travis County, Texas (“the Property”)

Dear Ms. Middleton-Pratt:


As representatives of the owner of the Property, we respectfully request to revise our original rezoning request for application C14-2023-0038.SH.

The Property is currently zoned SF-3-NP (Family Residence – Neighborhood Plan). This updated rezoning request is from SF-3-NP to MF-2-NP (Multi-Family – Limited Density – Neighborhood Plan). The Property is currently undeveloped. This request is consistent with nearby zoning designations.

The Property is located near the intersection of 12th Street and Springdale Road, an Imagine Austin corridor. The proposed project will include 244 multifamily units and is located on a high-frequency transit route, Capital Metro Route 300. As a S.M.A.R.T. Housing project, 40% of units will be affordable to households at 80% of the regional Median Family Income. Additionally, the project intends to participate in Affordability Unlocked. The purpose of this change is to allow participation in additional S.M.A.R.T. Housing programs should Affordability Unlocked not be an option. This parcel is part of a broader redevelopment with the Property’s adjoining parcels consisting of 592 units in total.

Please let me know if you or your team members require additional information or have any questions. Thank you for your time and attention to this project.

Sincerely,



Leah M. Bojo

cc: Joi Harden, Housing and Planning Department (*via electronic delivery*)

May 10, 2021

Urban ATX Development LLC
117 Lightsey Rd
Austin, Texas 78704

Re: aci Consulting, LLC: Bethany Cemetery

Dear Mr. Affinito,

In March of 2021, aci consulting was contracted by Urban ATX Development LLC to conduct a desktop assessment for the Bethany Cemetery located in Travis County, Texas. The investigation included a background records search of the Texas Archeological Sites Atlas (Atlas), which is an online database maintained by the Texas Historical Commission (THC), the Historic Texas Cemetery (HTC) designation documentation also maintained by the THC, and the historic background of the cemetery. The purpose of the assessment was to determine if the boundary of Bethany Cemetery extends into adjacent land parcels, as portrayed on the Atlas, or if the cemetery adheres to the current Travis County land plots as portrayed on the HTC documentation and Travis County Appraisal District parcel map (TCAD). Additionally, the assessment was meant to assist in determining the probability for burials to exist outside of the cemetery boundaries. This determination of probability was to be determined through historical documentation identifying the location of burials and identifying the historically delineated boundaries of the cemetery.

On April 30, 2021, the THC concurred that the boundaries for Bethany Cemetery and the CAD parcel boundaries appear consistent and correct. However, although the boundaries were consistent, this never precludes the possibility that graves may exist outside of the current fenced area (Attachment A).

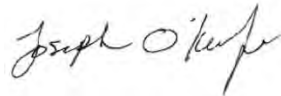
From April 26 to April 28, a survey using ground penetrating radar (GPR) was conducted by Cordillera Geo-Services in an L-shaped, ~30-ft-wide by ~700-ft-long corridor neighboring Bethany Cemetery's western and southern sides. The GPR survey was conducted in order to detect and map possible unmarked graves outside a portion of Bethany Cemetery's current limits likely to be encountered during future earthworks and construction at the site.

After reviewing the technical report created by Cordillera Geo-Services, I agree with the results that the mapped GPR anomalies found during the survey were inconsistent with human burials or unmarked graves; because the anomalies depart from human burials' typological features commonly observed in GPR surveys. Additionally, I agree with the conclusion that there is no requirement for excavations to verify the nature of the mapped GPR anomalies by excavation within the adjacent survey area because the anomalies are not suggestive of unmarked graves (Attachment B).

In the event that human remains or associated funerary objects are encountered during construction, all excavation activities will be immediately halted. The excavated area will be protected while archeologists consult with an osteologist, if necessary, to determine whether the remains are human. If it is confirmed that a burial has been encountered, the Project Manager will notify the landowner, the authorities for Travis County, and the THC. All processes going forward once human remains or associated funerary objects are encountered will comply with the Texas Administrative Code (Title 13, Part 2, Chapter 22, Rule 22.4 and Rule 22.5), the Texas Health and Safety Code (Title 8, Subtitle C, Chapter 711), and the Texas Penal Code (Title 7, Chapter 31; Title 9, Chapter 42, Section 42.08). The area shall remain protected until all parties involved have agreed to an appropriate plan of action, which may involve reburial or removal and relocation.

If you need further information or have questions, please contact me at any time on my direct number at 512.852.3876 or email at jokeefe@aci-group.net.

Sincerely,



Joey O'Keefe, MA, RPA
Principal Investigator

Attachment A: THC Concurrence with Boundaries of Bethany Cemetery

From: noreply@thc.state.tx.us
To: Joey OKeefe; reviews@thc.state.tx.us
Subject: Section 106 Submission
Date: Friday, April 30, 2021 2:48:09 PM



Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas

THC Tracking #202107716

Date: 04/30/2021

Cultural Desktop Assessment for the Bethany Cemetery in Travis County, Texas
4120 E 12th Street
Austin, TX 78721

Description: Review of Bethany Cemetery and associated paperwork. Adjust location of cemetery on Atlas, and probability of burials outside of cemetery boundary.

Dear Joseph O'Keefe:

Thank you for your submittal regarding the above-referenced project. This response represents the comments of the Executive Director of the Texas Historical Commission (THC), as a courtesy review only and does not suffice for review under Section 106 of the National Historic Preservation Act or the Antiquities Code of Texas.

The review staff, led by Tiffany Osburn, has completed its review and has made the following determinations based on the information submitted for review:

We have the following comments: Atlas boundaries for this cemetery have been altered. Although the boundaries of the HTC and the CAD parcel boundaries appear consistent and correct, this never precludes the possibility that graves may exist outside of the current fenced area.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: tiffany.osburn@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your

submissions. For more information, visit <http://thc.texas.gov/etrac-system>.




Sincerely,



for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

The image shows two scale bars for a map. The top scale bar is labeled "Feet" and has markings at 150, 75, 0, and 150. Below it, the scale is given as 1:1,800 and 1 inch = 150 feet. The bottom scale bar is labeled "Meters" and has markings at 50, 25, 0, and 50. Below it, the scale is given as 1:1,800 and 1 inch = 50 meters. A north arrow is located to the left of the top scale bar.

-  Atlas (2021) Cemetery Boundary
 HTC (2003) and TCAD (2020) Cemetery Boundary
 Travis County Parcels



Attachment B: Ground Penetrating Radar (GPR) Survey at 412 E. 12th Street,
Austin, Texas, 78721 in Support of Urban Development

Project: Ground Penetrating Radar (GPR) Survey at 4120 E. 12th Street, Austin, Texas, 78721 in Support of Urban Development

Location: Austin, Texas, USA

Client: Urban ATX Development, LLC

Job reference: UATXD28042021

Date: May 7, 2021




Submitted by:


Dr. Hector R. Hinojosa, P.G.

Principal Geoscientist & Founder


P.G. License # 12898


Certified HUB, MBE, DBE


 cordillerageo.services

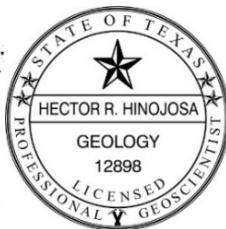
 +1 (737) 207-2536

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 hector.hinojosa@cordillerageo.services

 cordillerageoservices@gmail.com

 1723 Warwick Way, Cedar Park, TX 78613 USA



CORDILLERA GEO-SERVICES

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SUMMARY

The present ground penetrating radar (GPR) survey was carried out for Urban ATX Development LLC (UATXD) to support an urban development project at 4120 E. 12th Street, Austin, TX 78721. The present geophysical site investigation comprised site clearance followed by data collection, data processing, analysis and interpretation, and technical report writing. This non-invasive geophysical exploration's objective was to detect and map possible unmarked graves outside a portion of Bethany Cemetery's current limits likely encountered during future earthworks and construction at the site. A metallic chain link fence delimits the perimeter of Bethany Cemetery, with its gate facing Springdale Road. The explored section includes an L-shaped, ~30-ft-wide by ~700-ft-long corridor neighboring Bethany Cemetery's western and southern sides. Pleistocene and Holocene unconsolidated terrace deposits and clastic materials (mudstone and claystone) of the Late Cretaceous Ozan Formation comprise the subgrade. The lithologic constituents of the terrace deposits are mainly beds of coarse-detrital sand and fine-detrital silt with minor beds of coarse gravel and clay. However, the gravel predominates because it is part of the older, higher terrace deposits. The GPR's imaging capability is restricted to the terrace deposits only.

The GPR data acquisition parameters are as follows. The hardware consists of a GPR Data Acquisition Unit GSSI SIR-4000 connected to a 400 MHz transmitting antenna (model 50400S), a GPS antenna mount frame; all mounted on a 4-wheel survey cart model 654. The GPS comprises two GPS antennas that used real-time kinematic (RTK) technology. Geographic coordinates of single points were collected with a high-resolution geographic positioning system (GPS). The GPS hardware consisted of an EMLID Reach RS2 Real-Time Kinematic (RTK) system comprised of two GNSS receiver antennas that function as a rover station and as a base station that mounts to the GPR unit. The GPR data were processed, analyzed, and visualized with the latest version (v7.MT) of GPR-Slice software. The GPR survey's total surface area is estimated at 2,205 m², equivalent to 0.54 acres, and an investigation depth of 7.9 ft (2.25 m). 462 GPR transects were collected unidirectionally northwards because the known marked graves in Bethany Cemetery are aligned east-west, resulting in a total survey length of 14,013.45 ft (4,271.3 m). The transect spacing was 0.5-m (1.65 ft). Data collection was performed using the automatic gain control (4 points), 512 samples/scan, 333 scan rate, 12 scans/ft, 43 ns sampling range, 230 kHz scan rate, a dielectric constant of 7 (for sand), 100 MHz vertical high pass filter, and an 800 MHz vertical low pass filter. The data acquisition parameters were kept constant during the entire survey campaign.

Numerous high-amplitude geophysical anomalies of various shapes and dimensions are detected at multiple depth levels; however, all are inconsistent with human burials or unmarked graves because of their unusual oversized geometry, orientation, relative spacing, and shallow and deep burial depth; therefore, their nature is considered rather sedimentologic and stratigraphic. Hence, the present GPR report suggests that the historic cemetery's boundary neighboring the project area may still be the original boundary.

1. INTRODUCTION

Urban ATX Development LLC (UATXD) plans to build houses in a ~6 acres property located at 4120 E. 12th St., Austin, TX 78721. The proposed development would be surrounded by Bethany Historic Cemetery, a small commercial corner, and established houses on Cometa Street. UATXD has sub-contracted Cordillera Geo-Services, LLC to perform a non-invasive, non-destructive ground-penetrating radar (GPR) survey to support an ongoing environmental investigation for this site. The objective of the current GPR survey is to detect and map shallow (< 5-ft deep) anomalies consistent with unmarked graves outside and immediately adjacent to Bethany Cemetery's current limits that could be affected during the earthworks and construction process. The present geophysical site investigation comprised site clearance followed by data collection, data processing, analysis and interpretation, and technical report writing. Figure 1 shows the location of the GPR survey relative to the undeveloped property and the Bethany Cemetery.



Figure 1. The GPR survey is adjacent to Bethany Cemetery. The GPR survey is within a ~6 acres property planned to go under urban development in Northeast Austin, Texas.

2. GEOPHYSICAL METHOD: GROUND PENETRATING RADAR (GPR)

2.1. GPR fundamentals

GPR is an active geophysical (remote sensing) method that uses electromagnetic (EM) waves with frequencies between 10 MHz and 4 GHz to detect electrical properties changes in the subsurface materials. Transmission velocities of the EM waves are crucial in interpretation and are almost independent of frequency at radar frequencies for a wide range of materials (Milson

and Eriksen, 2011). Nowadays, GPR is an extensively used geophysical survey method for subsurface mapping applications in civil, geological, and geotechnical engineering, forensic and environmental surveys, and archaeological and geoarchaeological investigations (Conyers, 2004; Milsom and Eriksen, 2011).

A GPR survey can accurately map the spatial extent of shallowly buried objects and archaeological features or changes in soil media and ultimately yield images of those buried materials (Conyers and Goodman, 1997). Radar or EM waves are propagated in distinct pulses from a surface antenna, reflected off buried objects, features, bedding contacts, or soil units, and detected back at the source by a receiving antenna. As radar pulses transmit through various subsurface materials on their way to the buried targets, their velocity changes depending on the subsurface material's physical and chemical properties through which they travel. The greater the electrical and magnetic contrast between two juxtaposed materials, the greater the reflected signal's strength and, therefore, the greater the amplitude of the reflected EM waves. When the travel times of energy pulses are measured and their velocity through the ground is known, distance (or depth in the ground) can be accurately measured to produce a three-dimensional (3D) data set. Each time a radar pulse traverses a material with a different composition or water saturation, the velocity changes and a portion of the radar energy reflects back to the surface to be recorded at the receiving antenna. The remaining energy continues to propagate into the ground to be further reflected until it finally spreads and dissipates or attenuates with increasing depth (Conyers and Goodman, 1997). When EM wave reflection traces are stacked together along one transect line, a reflection profile or radargram is created that illustrates a cross-section of the ground (Conyers, 2006).

Following Conyers (2006), the depths to which radar energy can penetrate, and the amount of resolution that can be expected in subsurface deposits, are partially controlled by the frequency (and therefore the wavelength) of the transmitted EM waves. Standard GPR antennas propagate radar energy that varies in frequency from about 10 megahertz (MHz) to 1,000 MHz. Low-frequency antennas (10-120 MHz) generate long-wavelength radar energy that can penetrate 50 meters below the surface in certain conditions and resolve only very large buried features. Conversely, the maximum depth of penetration of a 900 MHz antenna is about ≤ 1 meter in typical materials, but its generated reflections can resolve features with a maximum dimension of a few centimeters. A trade-off, therefore, exists between the depth of penetration and subsurface resolution. Hence, GPR surveys' success in archaeological and historic preservation investigations depends mainly on soil and sediment mineralogy, clay content, ground moisture, depth of burial, surface topography, and vegetation cover. Electrically conductive or highly magnetic materials will quickly attenuate radar energy and prevent its transmission to a considerable depth. Therefore, the best conditions for energy propagation are dry sediments and soils without an abundance of clay.

A crucial point in all GPR surveys is the commonly unknown or poorly understood site conditions before the survey. In a GPR survey, the depth of investigation decreases in response to an increase of the following factors within the subsurface materials: electrical conductivity, water content, clay content, EM wave scattering, and conductive contaminant. Unfortunately, the GPR practitioner has no control over these factors because these are site-specific characteristics. Conversely, the depth of investigation increases when the GPR user controls some factors. The depth of investigation increases when the antenna frequency decreases, as transmitter power increases, and as the receiver sensitivity increases.

2.2. *Justification of the GPR method*

The GPR is an active geophysical (remote sensing) method that uses EM waves with frequencies between 10 MHz and 4 GHz to detect changes in electrical properties within subsurface materials (Milson and Eriksen, 2011). GPR systems, regardless of the transmitting antennas they use to transmit EM waves, are susceptible to the near-subsurface stratigraphy and can detect the presence of shallowly buried targets as long as there is enough electrical and magnetic contrast between the material and the surrounding matrix; hence, they are attractive in archeological, environmental, and engineering investigations. The GPR method has proven successful in archaeological studies within both urban (Jones, 2008; Urban et al., 2014a; Piro et al., 2017) and remote settings (Millaire and Eastaugh, 2014; Novo et al., 2014; Urban et al., 2014b) because of the following features, which make it ideal for this project:

- is a non-destructive, non-invasive, and cost-effective prospecting technique
- offers a rapid ability to map shallowly buried objects and structures of archaeological or historical context or interest
- provides valuable results that assist excavation strategies by efficiently highlighting the best candidate locations and depths for excavation
- the results complement input from archeological or geoarchaeological investigations or even other geophysical methods

3. **GPR SURVEY DESCRIPTION**

This section discusses the hardware and software used in the survey, the survey program and conditions, the data acquisition parameters, and data processing steps.

3.1. *Hardware and software used*

The following GPR system and software were used for the present GPR survey:

- The hardware, made by Geophysical Survey System Inc. (GSSI), consists of a GPR Data Acquisition Unit GSSI SIR-4000 connected to a 400 MHz transmitting antenna (model 50400S), GPS antenna mount frame, all mounted on a 4-wheel survey cart model 654.
- The GPS hardware consisted of an EMLID Reach RS2 Real-Time Kinematic (RTK) system comprised of two GNSS receiver antennas that function as a base station and a rover station mounted GPR cart.
- We used the latest version (v7.MT) of GPR-Slice software for data processing, analysis, and visualization.

Figure 2 shows field photographs of the assembled GPR unit used in this survey in standard mode and RTK mode for synchronized GPS coordinates during raw data collection.

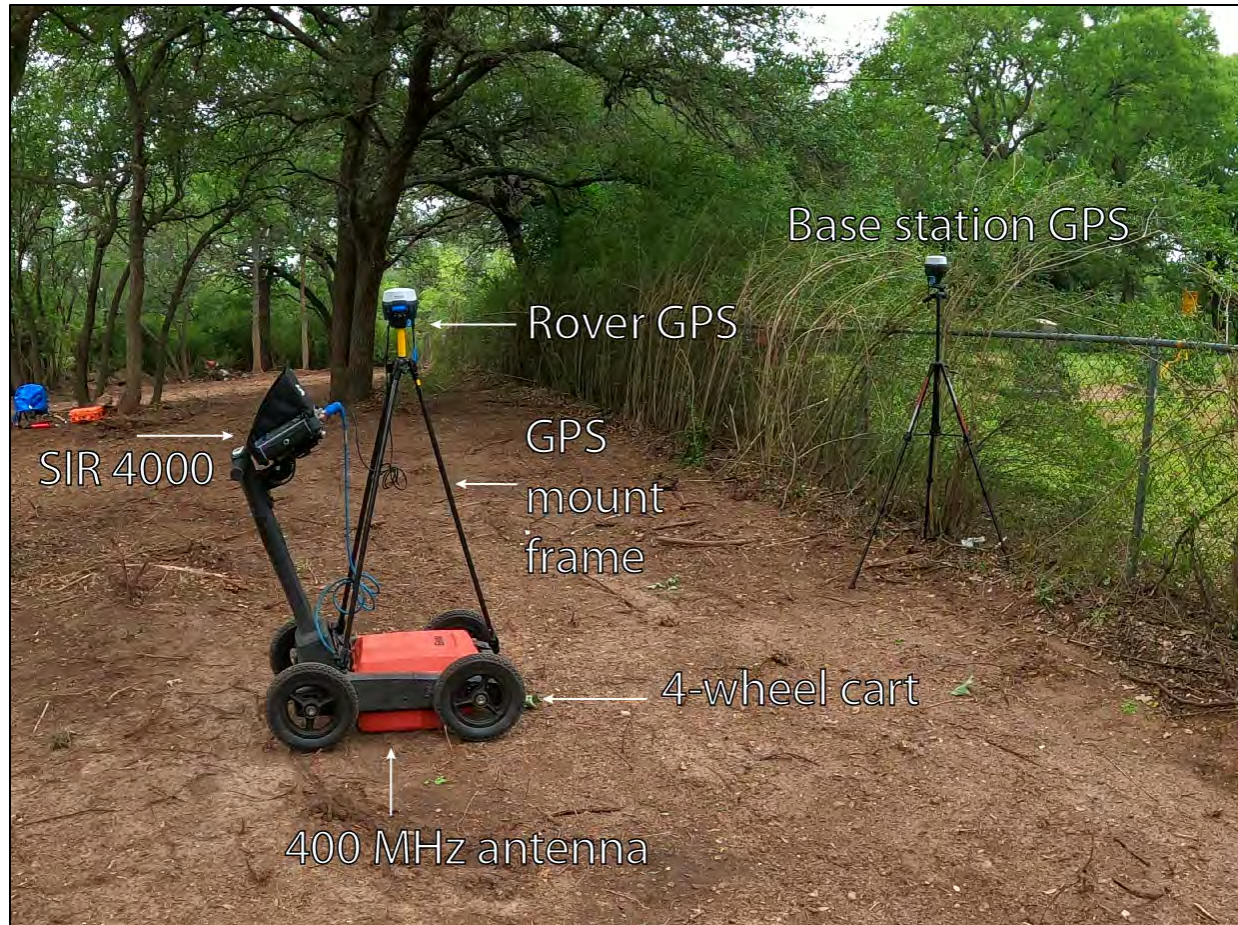


Figure 2. The GPR unit used in the present remote sensing survey consisted of the GSSI SIR-4000 data acquisition console connected to a 400 MHz antenna (model 50400S), all mounted in a 4-wheel survey cart model 654 in RTK mode ready for continuous geographic coordinates acquisition while logging raw GPR data.

3.2. Survey program

Personnel from UATXD indicated the physical location and surface extent of all areas before data acquisition. The GPR data were acquired from April 26 to 28 of 2021, after clearing the thick shrub vegetation. The GPR survey grid has an L-shaped, grid approximately ~30-ft-wide by ~700-ft-long, because it wraps around the western and southern Bethany Cemetery's boundaries, covering a total surface area of 2,205 m², equivalent to 0.54 acres. A total of 462 GPR transects were collected unidirectionally towards the north (i.e., from north to south) because the marked graves in Bethany Cemetery are aligned east-west. The total survey length is estimated at 14,013.45 ft (4,271.3 m). All GPR transects were spaced at 0.50 m (1.64 ft). Each start and endpoint for each transect was marked with a green and orange flag, respectively. Figure 3 shows the GPR grid's location, geometry and orientation, and field photographs. Figure 4 illustrates some of the physical obstacles encountered by the GPR unit during the survey. The obstacles lead to interrupted profiles, cause delays during data acquisition, and leave gaps in the final 3D image.



Figure 3. (A) Aerial photograph of the target area at 4120 E. 12th Street, Austin, Texas, 78721. The GPR survey was done in an L-shaped grid approximately ~30-ft-wide by ~700-ft-long. The blue lines show the orientation of all GPR-GPS tracks during the GPR survey, which borders Bethany Cemetery's current boundary. The gap in the GPR-GPS tracks is due to the occurrence of a natural channel backed filled with trash (see Figure 3D). Field photographs are shown in (B) to (D). Photo sources: (A) from Google Earth, (B) to (D) by author.



Figure 4. Examples of physical obstacles encountered by the GPR unit during the survey in Area 1 and Area 2. The obstacles cause significant delays in data acquisition, make data processing more demanding, and yield data gaps.

3.3. Survey conditions

Before the GPR survey, rainfall is reported for April 22nd and 23rd. However, the weather conditions during the survey were primarily cloudy but without rain; and the topsoil conditions were dry during data acquisition. So percolation of rainwater through the soil is possible and cannot be excluded. The topsoil is composed of Pleistocene and Holocene unconsolidated terrace deposits and clastic materials (mudstone and claystone) of the Late Cretaceous Ozan Formation comprise the subgrade. The GPR's imaging capability is restricted to the terrace deposits only. The lithologic constituents of the terrace deposits are mainly beds of coarse-detrital sand and fine-detrital silt with minor beds of coarse gravel and clay. However, the gravel predominates because it is part of the older, higher terrace deposits. Power lines run along E. 12th Street and Springdale Road and are far (50 to 90 ft) from the GPR survey grid. Oak trees and the channel acted as obstacles for some GPR transects. This survey required significant clearance of vegetation, including bulldozing of the area and removing overgrown shrub tree stumps.

3.4. *Data acquisition parameters*

Data collection was performed using the automatic gain control (4 points), 512 samples/scan, 333 scan rate, 12 scans/ft, 43 ns sampling range, 230 kHz scan rate, a dielectric constant of 7 (for sand), 100 MHz vertical high pass filter, and an 800 MHz vertical low pass filter. A 400 MHz antenna was used in this survey, producing satisfactory EM (electromagnetic) wave propagation down to 7.9 ft below the surface. These data acquisition parameters were kept constant during the entire survey campaign. Geographic coordinates of single points were collected with a high-resolution geographic positioning system (GPS). The GPS comprises two GPS antennas that used real-time kinematic (RTK) technology, as shown in Figure 2.

3.5. *Data processing, analysis, and visualization*

The initial data processing for the project involved the generation of individual 2D vertical radar profiles or 'radargrams.' Subsequently, amplitude or time slice-maps were generated for the L-shaped grid. Figure 5 shows the adopted data processing workflow applied to all GPR data sets.

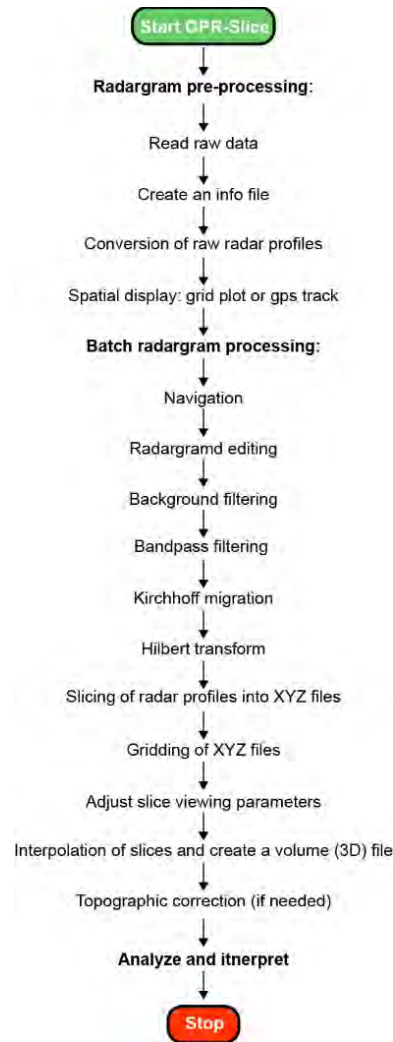


Figure 5. Adopted data processing workflow for the GPR grid.

4. THE CHARACTERISTICS OF GRAVES

At some historic cemeteries, grave markers have become lost, destroyed, or misplaced for several reasons; wood quickly rots. Gravestones may break or crumble. Vandalism and falling trees also can contribute to the loss. Some graves may never have been marked. As time and land development progress, it can become essential to find these old, unmarked graves. Sometimes, they are accidentally encountered during construction, and someone might want to determine the extent to which the cemetery is preserved. In other cases, it might be necessary to locate individual burials to be removed and transferred to another location (Bevan, 1991).

Beavan (1991) describes elegantly the physical characteristics of graves and the expected features likely found by geophysicists when carrying shallow investigations. The most distinctive feature of a grave may be the disturbed soil in the filled excavation. The soil may change markedly through the 3.3 to 6.6 ft (1 to 2 m) depth of a grave shaft. When the excavated earth is replaced, some topsoil may return to the bottom of the hole, and the subsoil may end up on top and maybe spread on the surface. The topsoil can be higher in magnetic susceptibility than the subsoil. Also, the electrical conductivity of the natural earth may increase or decrease with depth. The soil filling the grave shaft could have a different magnetic and electrical stratification than the natural earth,

and these soil changes could last indefinitely. Except for recent criminal burials, nothing may remain except for bones. While the bones may last for thousands of years in some soil types, they will generally not be directly detectable; however, the body's decay can alter the surrounding soil's chemical composition.

The soil also could be less compacted at the bottom of the grave shaft. If a coffin is still partially intact, there could be an air-filled void. Coffin nails would usually be undetectable, but some coffin fittings could be large metal objects. Metallic or lead coffins could be present. If there is a burial vault of brick or stone, there could be an air cavity, and the brick or stone might be moderately magnetic (Bevan, 1991). The soil in the grave shaft might have settled, leaving a shallow depression at the surface. The surrounding soil might have washed into this, filling it up; this extra lens of topsoil might be detectable. Metallic debris could have accumulated in the depression. The grave marker might have fallen and been buried at a shallow depth. A grave can be delineated with a pipe or a stone border, likely buried in leaf mold (Bevan, 1991).

While burial practices change with time and location, some earlier western cultures have aligned graves east-west with a coffin at a depth of 1-2 m. A cemetery could more likely be on a hilltop than in a valley. It might be possible to locate a cemetery area even though individual graves might not be detectable. The cemetery was possibly never plowed, although the surrounding land was; the cemetery boundary could mark contrast in the soil's stratification or moisture retention. Trees might have been allowed to grow in the cemetery while the surrounding land remained clear; remnants of the ancient trees might be detectable if their roots have not decayed or if soil scars from fallen trees are present (Bevan, 1991). Geophysical methods can detect many of the characteristics described above. However, the setting is sometimes tricky: if neglected, the area could be overgrown with trees or brush, and there could be a veneer of metallic trash on the surface (Bevan, 1991).

5. RESULTS AND INTERPRETATION

The analysis and interpretation were made on the resulting time-slices or absolute amplitude slice-maps and the 3D volume of absolute amplitude. The results strongly depend on the natural site conditions at the time of the GPR survey. The percolation of rainfall through the soil (unconsolidated clastic terrace deposits) and its temporary accumulation are the primary natural factor influencing the depth of investigation.

The 3D absolute amplitude volume is sliced horizontally to show the variation in reflection amplitudes at a sequence of depth intervals in the ground. The result is a map showing absolute amplitude anomalies in map view but also with depth. Often when this is done, changes in the soil related to disturbances such as human burials or other targets, if present, become visible to the human eye that may not be visible in individual profiles.

The 2D vertical radargrams are of interest because they respond to physical and chemical differences in the buried materials. Strong or high-amplitude reflections often indicate denser or different buried materials, such as historic features or burials. In burials, these can be generated at pockets of air, such as within caskets, at the actual caskets, or the material overlying the burial. In this method, amplitude variations, recorded as digital values, are analyzed at each location in a grid of many profiles where there is a reflection recorded. The amplitudes of all traces are compared to the amplitudes of all nearby traces along each profile. From the original raw GPR data files (*.dzt), a series of image files were created to cross-referencing the amplitude slice-

maps produced. 2D radargrams were also analyzed jointly with its corresponding 3D cube to determine the amplitude slice maps features. The reflection profiles showed the reflections' geometry, which led to insights into whether the radar energy reflects a flat layer (seen as a distinct band on a profile) or a single object or burial (seen as a hyperbola in profile). Overall, the results of the 2D reflection radargrams and 3D amplitude radargrams collectively do not suggest the existence of human burials or graves within the present L-shaped GPR grid.

The high-resolution 3D GPR survey results provide helpful information about the subsurface site conditions adjacent to Bethany Cemetery. The GPR grid borders the western and southern sides of Bethany Cemetery. Figure 6 shows the resulting 3D volume of the L-shaped GPR grid that reaches a maximum investigation depth of 7.9 ft. Numerous high-amplitude anomalies are detected within the depth range. In historic cemeteries, the main typological features suggestive of human burials or graves are size, shape, east-west burial orientation, and a typical burial depth interval constrained between 3 to 4 ft. However, the analysis and interpretation of both the GPR grid's amplitude slice-maps and 3D volume suggest that numerous high-amplitude anomalies (red) stand out in a low-amplitude anomaly background; however, these anomalies are not consistent with human burials or unmarked graves because they depart from human burials' typological features commonly detected in GPR surveys. Figure 7 illustrates multiple horizontal depth slices in incremental intervals of 0.53 ft. Finally, figure 8 shows the critical horizontal depth slices from 2.6 ft to 4.5 ft. A depth interval between 3 to 4 ft is likely to contain high-amplitude anomalies compatible with unmarked graves or human burials; however, these depth slices show not evidence of unmarked graves throughout the GPR grid. The high-amplitude anomalies are interpreted as Pleistocene and Holocene unconsolidated clastic terrace deposits unconformably overlying mudstones and claystones of the Late Cretaceous Ozan Formation.

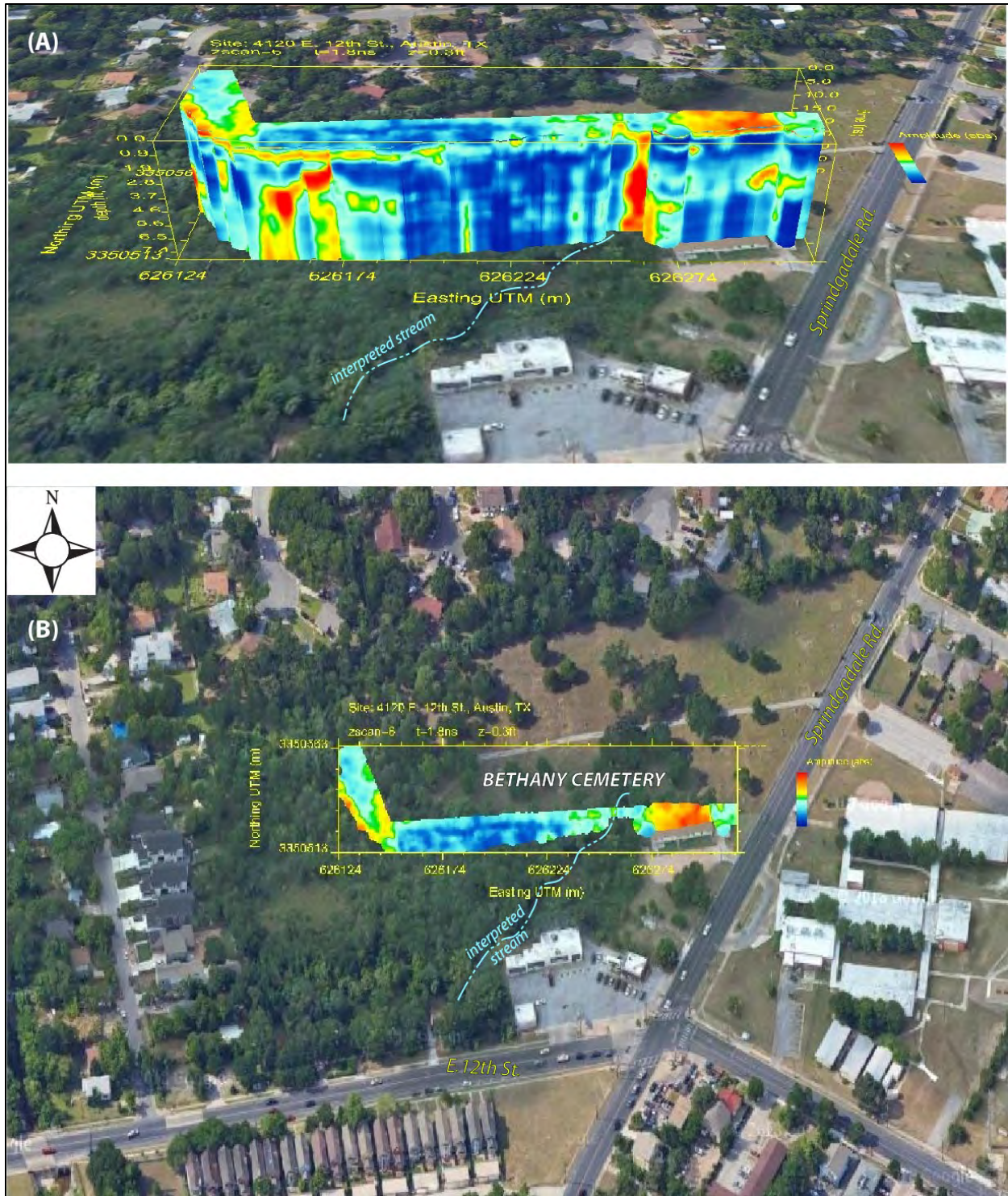


Figure 6. 3D absolute amplitude volume of the L-shaped GPR grid viewed from the south (A) and the top view of a depth slice at 0.3 ft (B). Bethany Cemetery, adjacent roads, and an interpreted stream are shown for reference.

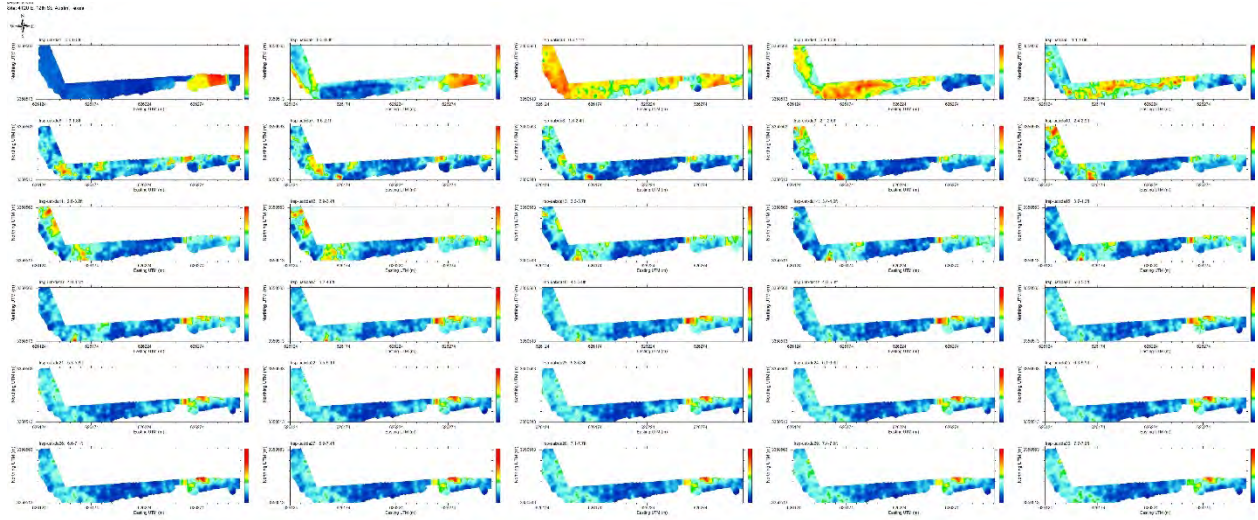


Figure 7. All horizontal depth slices of the L-shaped GPR grid from 0 to 7.9 ft depth showing the distribution of high-amplitude (absolute) anomalies (in red) against low-amplitude (absolute) anomalies (in blue). The thickness of each horizontal depth slice is computed at 0.53 ft.

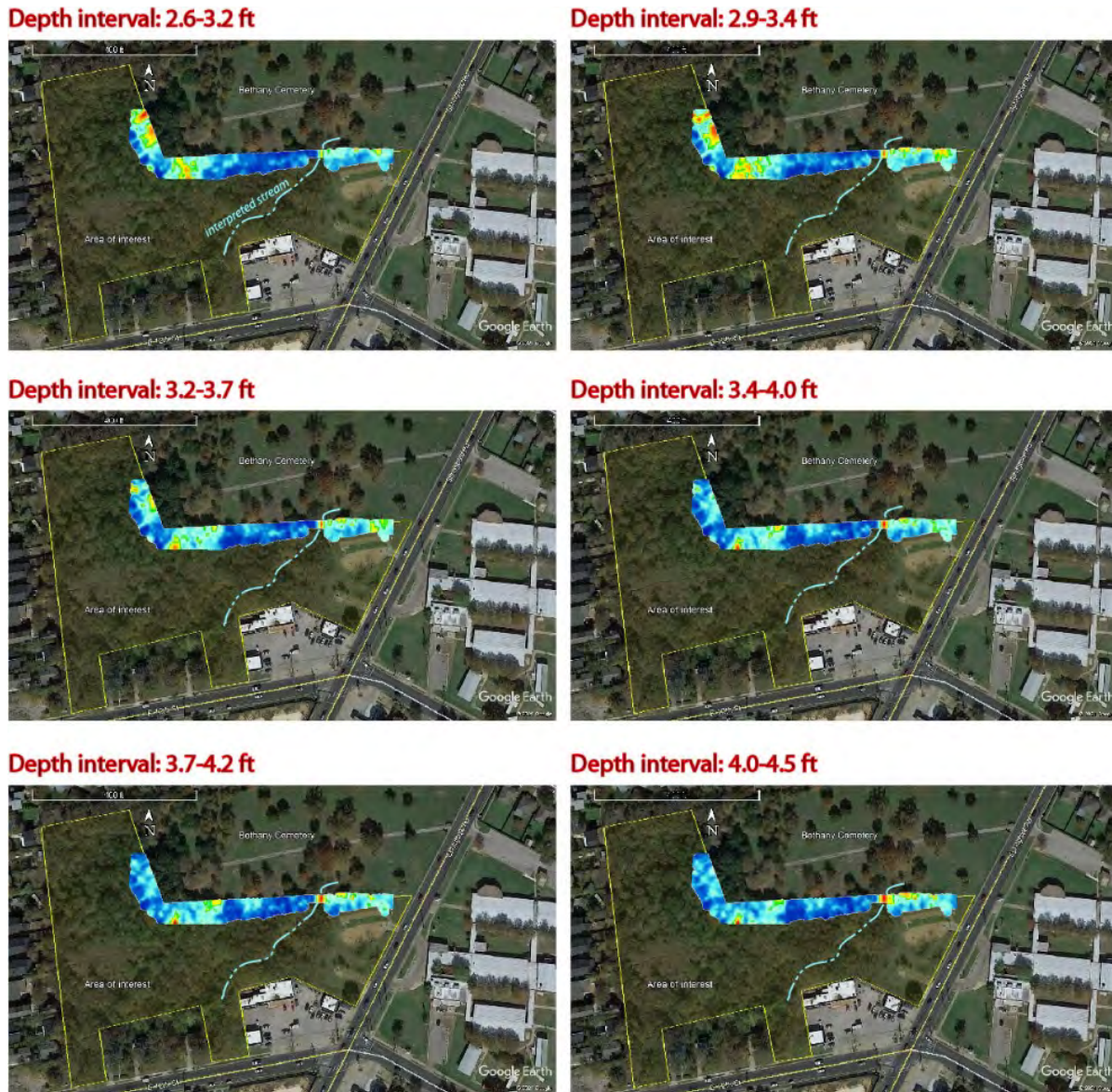


Figure 8. Critical horizontal depth slices from form 2.6 to 4.5 ft depth showing the horizontal and vertical distribution of high-amplitude anomalies (in red) against a low-amplitude anomaly background (in blue). The anomaly maps indicate the absence of absolute amplitude anomalies showing inconsistent evidence of human burials immediately outside Bethany Cemetery.

6. CONCLUSIONS AND RECOMMENDATIONS

The present high-resolution GPR survey provides helpful information about the subsurface site conditions at the project site located at 4120 E. 12th St., Austin, TX 78721, which is adjacent to the boundaries of Bethany Cemetery. Numerous high-amplitude anomalies are detected within a depth range of 7.9 ft. In historic cemeteries, the main typological features suggestive of human burials or graves include size, shape, an east-west burial orientation, and a typical burial depth interval of 3 to 4 ft (0.90 to 1.2 m) are observed in GPR surveys. However, the analysis and interpretation of the resulting absolute amplitude slice-maps and accompanying 3D volumes of the L-shaped GRP grid suggest that the mapped GPR anomalies are inconsistent with human

burials or unmarked graves; because the anomalies depart from human burials' typological features commonly observed in GPR surveys. Based on the above results, Bethany Cemetery might still preserve its original boundary. In addition, there is no requirement for excavations to verify the nature of the mapped GPR anomalies by excavation because they are not suggestive of unmarked graves. The high-amplitude anomalies are interpreted as the response of shallowly buried clastic deposits within the young clastic terrace deposits.

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Correspondence Received for C14-2023-0038.SH

Email from MLK Neighborhood Association
09/05/23 12:09pm

Good afternoon Mr. Tomko and Planning Commission,

The Martin Luther King Neighborhood Association requests a postponement of the September 12 rezoning case for 4120 E 12th St (Case # [C14-2023-0038.SH](#)) to allow time for the developer to exercise due diligence to ensure this development is an intentional yet integral part of this community. Due to the unique nature of this property as it is an inset into the neighborhood along with its proximity to Bethany Cemetery, we request a postponement for the following reasons:

1. The neighborhood association recently received the renderings for the development. We have not had time to share with the community at large, review and meet with the developer's representative (we were going to invite them to our September 11th NA meeting). There are currently NO community benefits attached to this development. The community feels there has not been enough due diligence from the developer to address the needs of the community and integrating this land/lot into the community.
2. The neighborhood along with the Bethany Cemetery Association has additional archaeology, environmental setbacks, impervious cover, affordability, flood and public concentration concerns, as stated earlier due to the uniqueness of this land. The community feels that the survey of the land was not done far enough or deep enough as it pertains to the current property line and boundaries of Bethany Cemetery and possible grave shafts.
3. We support all requests of Bethany Cemetery as it is a vital historical staple in our community

Thank you for your consideration in this matter

Alexandria M. Anderson
MLKNA Chair

--

Martin Luther King Neighborhood Association
P.O Box 15482
Austin, TX 78761

"Unity Through Community"
www.mlkneighborhood.org



Email from Bethany Cemetery
09/05/2023 3:16pm

The Bethany Cemetery Association requests a postponement of the September 12 rezoning case for 4120 E 12th St (Case # [C14-2023-0038.SH](#)) to allow time for the developer to exercise due diligence to ensure that there is minimal likelihood of the presence of unmarked graves on this parcel. Due to the nature of this property and its proximity to Bethany Cemetery, we request that the developer conduct an archaeological survey with scrape to identify any possible grave shafts along the area adjacent to the west and south boundaries of the cemetery in advance of any planning commission meeting. Additionally, we request that these services be performed by an archaeologist vetted by the Texas Historical Commission. Thank you for your consideration in this matter.

Sincerely,
Sue Spears

Email from MLK Neighborhood Association
09/06/2023 1:30pm

Good afternoon Jonathan,
Thank you for your follow up. Our neighborhood would like October 10th.

Take care,
Alexandria

Email from Bethany Cemetery
09/06/2023 1:55pm

October 10, please.