Staff Report

Knoxville Historic Zoning Commission

File Number: 7-J-25-HZ

Meeting: 9/18/2025

Applicant: Ethan Fields, F.E. Trainer Construction LLC

Owner: Garriy & Catherine Shteynberg

Property Information

Location: 221 E. Oklahoma Ave. **Parcel ID** 81 L S 018

District: Old North Knoxville H

Zoning: RN-2 (Single-Family Residential Neighborhood)

Description: Queen Anne, c.1900

One-story frame with wood lap siding. Hip roof with lower cross gables and asphalt shingle roof covering. One story three-quarter front porch with fluted round columns with Ionic capitals. Brick foundation. Irregular plan. Recessed transom and sidelights at front entry. Projecting bay on south elevation.

Description of Work

Level II Construction of Addition or Outbuilding

Conversion of existing detached garage to an accessory dwelling unit (ADU) and addition of a carport. The existing garage with a 4/12 pitch front-gable roof is 17’-4” wide by 21’-8” deep will remain, and a 7.5’ deep crushed gravel patio enclosed by fencing will be installed at the rear of the structure, along the alley. The new carport will be installed perpendicular to the existing garage, starting at the right corner of the patio, and will measure 32’-9.5” wide by 20’ deep, with a 6’-7.5” wide by 11’-3” deep recess marked for a custom shed. The proposed outbuilding will be flush with the rear and side lot lines.

The two existing double-hung wood windows, garage door, and concrete slab floor will be removed. The existing door will be removed and replaced (specs say "match existing"). The ADU will feature three 1/1 double-hung windows, two casement windows, and three transom windows (all wood). The existing wood board-and-batten siding will be repaired and retained, with in-kind wood siding installed in the place of the existing window and garage door openings. The existing asphalt shingle roof will be replaced in-kind, preserving the exposed rafter tails. Gutters will be installed on the ADU and carport.

The carport will feature a concrete parking pad and raised block foundation covered by a low-pitch (0.5/12) shed roof made from standing-seam metal with eave overhangs and supported by 6” square treated pine posts. In-kind wood fencing will be installed at the rear and side of the carport, connecting to the existing fence, creating a recess for trash storage facing the alley. The shed walls will be clad with wood board-and-batten siding, in-kind to the existing outbuilding, and will feature new double doors, and a door will be installed adjacent to the shed to access the parking area. The carport will be accessed via the rear alley, with a concrete ramp and walkway between the ADU and carport.

The project includes the installation of a small solar tube on the ADU and the installation of a solar array that takes up a majority of the area of the carport roof and both roof planes of the ADU. The array features anodized aluminum frames and will protrude 4-7” from the roof plane.

Applicable Design Guidelines

Old North Knoxville Design Guidelines, adopted by the Knoxville City Council on November 25, 2004.

A. Roofs

4. Materials used in roofing existing buildings or new construction shall duplicate the roofing materials originally found in the neighborhood. Asphalt or fiberglass shingles can be appropriate, as are wood, slate, standing seam metal, or metal shingle or tile roof coverings. The color of roofing materials should be a dark green, charcoal gray, black or dark reddish brown to simulate the original roof colors.

5. Do not place solar collectors or modern skylights on roof areas that are visible from the street, and do not install them where they interfere with decorative roof elements.

B. Windows

1. Original windows shall be reused if possible. It will be much less expensive and much better historically to retain the original windows, and it is inappropriate to replace them with new windows that differ in size, material or pane division.

2. If replacement windows are necessary, they shall be the same overall size as the originals, with the same pane division and the same muntin depth, width and profile. They shall be the same materials as the original windows, which were generally wood.

D. Entrances

7. Secondary entrances must be compatible with the original in size, scale and materials, but clearly secondary in importance.

E. Wood Wall Coverings

3. Replacement siding must duplicate the original. Trim and patterned shingles that must be replaced must also duplicate the original material.

5. Wooden features shall be repaired by patching, piecing-in, or otherwise reinforcing the wood. Repair may also include limited replacement with matching or compatible substitute materials, when elements remain and can be copied.

7. Replace only deteriorated wood. Reconstructing in order to achieve a uniform or “improved,” “new” appearance is inappropriate because of the loss of good historic materials.

L. Additions

1. Locate exterior additions at the rear of or on an inconspicuous side of a historic building, limiting the size and scale in relationship to the historic building, and using appropriate proportions.

2. Design new additions so that it is clear what is historic and what is new.

3. Consider the attached exterior addition both in terms of the new use and the appearance of other buildings in the historic district. Additions shall be distinguishable from the historic building, but shall be compatible in terms of mass, materials, size, texture, and scale. Additions shall be designed so they can be removed without destroying the form of the historic building.

4. New additions should not be visible from streets.

6. Do not cause a loss of historic character through a new addition.

M. Auxiliary or Outbuildings

1. The design of outbuildings such as garages shall acknowledge and suggest the function of original outbuildings that would have been located in the neighborhood.

4. Materials used in constructing outbuildings or accessory buildings may only use materials and design characteristics selected from the following list: wood lap siding with a four inch lap or board and batten; a 12/12 roof pitch; overhanging eaves; exposed rafter tails; wood windows; masonry but not exposed concrete block or split-face block; garage doors appearing to be carriage doors or plank doors with x-bracing or perimeter reinforcing timbers.

Comments

Staff Findings

1. 221 E Oklahoma Avenue is a contributing resource to the Old North Knoxville National Register Historic District and the local overlay. The existing outbuilding is a contributing resource in the National Register nomination and was constructed at the same time as the house.

2. The applicant is requesting a variance to reduce the interior side setback of the accessory structure that is scheduled to be heard by the Knoxville Board of Zoning Appeals on October 20. Any necessary variances must be granted, and the case must come back before the Commission if they are denied.

3. The existing outbuilding and proposed carport and shed are located at the rear of the property and are minimally visible from the right-of-way due to the existing trees on both sides of the house. The accessory structures will be further screened by the installation of additional in-kind wood fencing.

4. The proposed removal of the existing concrete slab floor, windows, garage door, and entry door from the historic outbuilding is appropriate, as the features are not visible from the right-of-way and are not character-defining. The placement of the new double-hung, casement, and transom windows and entry door is appropriate, as is infilling the existing window and door openings with in-kind wood board-and-batten siding.

5. Although design guidelines encourage accessory structures to include materials and design elements that reflect the historic outbuildings, contemporary accessory structures with metal roofing have been approved in Old North Knoxville when not visible from the street, and the use of contemporary materials will highlight the historic character of the existing outbuilding. The carport is accessed via the alley and could be removed without effect on the historic outbuilding, which meets the design guidelines. The carport's custom shed will feature wood board-and-batten siding, in-kind to the ADU, which is appropriate.

6. Final product specifications for all doors and windows should meet the design guidelines and be sent to staff for review. Guidelines discourage the use of exposed concrete blocks in accessory structures. Exposed sections of the block foundation should be parge-coated, clad in stucco, or clad in brick veneer.

7. Guidelines recommend that solar arrays and skylights be installed on roof planes not visible from the street. The proposed solar tube and solar array take up most of the roof planes on the ADU and the carport but will not be visible from the right-of-way. The roof truss of the historic outbuilding should be reinforced as necessary during the roof replacement to support the weight of the solar array without damage to the structure and the exposed rafter tails.

Staff Recommendation

Staff recommends approval of Certificate 7-J-25-HZ, subject to the following conditions: 1) receiving approval for any necessary variances from the Knoxville Board of Zoning Appeals, with the project to return to the Commission if the variances are denied; 2) meeting the standards of City Engineering and the Zoning code, as applicable, with minor revisions to be approved by staff; 3) final product specifications for all doors and windows to be sent to staff for review and be reflected in elevation drawings; 4) exposed sections of concrete block to be parge-coated, clad in stucco, or clad in brick veneer; and 5) documentation be provided that the roof truss of the historic outbuilding can support the weight of the solar array, with or without reinforcement.

HISTORIC ZONING COMMISSION

7-J-25-HZ

APPLICATION FOR CERTIFICATE OF APPROPRIATENESS

221 E. Oklahoma Ave. 37917

Old North Knoxville H

Original Print Date: 7/9/2025

Knoxville/Knox County Planning -- Historic Zoning Commission

Petitioner: Ethan Fields, F.E. Trainer Construction LLC

N

0 250

Feet

DESIGN REVIEW REQUEST

- ☐ DOWNTOWN DESIGN (DK)
- ☒ HISTORIC ZONING (H)
- ☐ INFILL HOUSING (IH)

Planning
KNOXVILLE | KNOX COUNTY

Ethan Fields		
Applicant		
6-30-25	~~7-17-25~~ 07/16/2025	7-J-25-HZ
Date Filed	Meeting Date (if applicable)	File Number(s)

CORRESPONDENCE

All correspondence related to this application should be directed to the approved contact listed below.

☐ Owner ☒ Contractor ☐ Engineer ☐ Architect/Landscape Architect

Ethan Fields		F.E. Trainer Construction, LLC		
Name		Company		
1185 Keowee Ave		Knoxville	TN	37919
Address		City	State	Zip
865-255-5190	efields@fetconstruction.com			
Phone	Email			

CURRENT PROPERTY INFO

Garriy & Catherine Shteynberg	221 E Oklahoma Ave	
Owner Name (if different from applicant)	Owner Address	Owner Phone
221 E Oklahoma Ave	081LS018	
Property Address	Parcel ID	
Old North Knox	RN-2	
Neighborhood	Zoning	

AUTHORIZATION

Lindsay Lanois	Lindsay Lanois	6.30.25
Staff Signature	Please Print	Date
Ethan Fields Digitally signed by Ethan Fields Date: 2025.06.30 11:54:34 -04'00'	Ethan Fields	6-30-25
Applicant Signature	Please Print	Date

REQUEST

DOWNTOWN DESIGN

Level 1:

☐ Signs ☐ Alteration of an existing building/structure

Level 2:

☐ Addition to an existing building/structure

Level 3:

☐ Construction of new building/structure ☐ Site design, parking, plazas, landscape

See required Downtown Design attachment for more details.

☐ Brief description of work: _____

HISTORIC ZONING

Level 1:

☐ Signs ☐ Routine repair of siding, windows, roof, or other features, in-kind; Installation of gutters, storm windows/doors

Level 2:

☐ Major repair, removal, or replacement of architectural elements or materials ■ Additions and accessory structures

Level 3:

☐ Construction of a new primary building

Level 4:

☐ Relocation of a contributing structure ☐ Demolition of a contributing structure

See required Historic Zoning attachment for more details.

■ Brief description of work: Convert interior of existing detached garage to ADU, new carport to side of garage

INFILL HOUSING

Level 1:

☐ Driveways, parking pads, access point, garages or similar facilities ☐ Subdivisions

Level 2:

☐ Additions visible from the primary street ☐ Changes to porches visible from the primary street

Level 3:

☐ New primary structure

☐ Site built ☐ Modular ☐ Multi-Sectional

See required Infill Housing attachment for more details.

☐ Brief description of work: _____

STAFF USE ONLY

ATTACHMENTS

☐ Downtown Design Checklist

☐ Historic Zoning Design Checklist

☐ Infill Housing Design Checklist

ADDITIONAL REQUIREMENTS

☐ Property Owners / Option Holders

Level 1: $50 • **Level 2:** $100 • **Level 3:** $250 • **Level 4:** $500

FEE 1:	TOTAL:
100.00	100.00
FEE 2:	
FEE 3:	

Pd. 06/30/2025, SG

SHTEYNBERG ADU

221 E OKLAHOMA AVE, KNOXVILLE, TN 37917

SCOPE OF WORK

THIS PROJECT INVOLVES CONVERTING AN EXISTING GARAGE INTO A FULLY FUNCTIONAL ACCESSORY DWELLING UNIT (ADU) FOR ELDERLY PARENT USE, WITH FUTURE PLANS FOR TENANT RENTAL. THE SCOPE INCLUDES DEMOLITION OF THE EXISTING CONCRETE SLAB, AND CONSTRUCTION OF A NEW ONE-BEDROOM UNIT WITH A BATHROOM, KITCHEN, AND LIVING AREA.

POWER, SEWER, AND WATER LINES WILL BE EXTENDED FROM THE MAIN RESIDENCE AND ROUTED AS NEEDED, TO BE DETERMINED ON-SITE BY THE CONTRACTOR. MECHANICAL AND PLUMBING SYSTEMS WILL BE INSTALLED OR UPDATED TO MEET CURRENT RESIDENTIAL CODES.

ALL WORK WILL COMPLY WITH LOCAL ZONING REGULATIONS AND BUILDING CODES.

PROJECT DATA

PROJECT ADDRESS:	221 E OKLAHOMA AVE, KNOXVILLE, TN 37917
PROPERTY TYPE:	101 FAMILY
ACRES:	0.19 (8,276 SQ FT)
PARCEL:	18
PARCEL ID:	081LS018
ZONING:	R-2
PLAT:	5-296
SUBDIVISION:	MOUNTAIN VIEW
MAIN DWELLING SQ FT:	1,733
GARAGE SQ FT:	376
CARPORT SQ FT:	420
LOT COVERAGE %:	30.86
WATER/SEWER:	YES
GAS	YES
ELECTRICITY:	YES

PROJECT TEAM

PROPERTY OWNER:

OWNER:	CATHERINE AND GARRIY SHTEYNBERG
ADDRESS:	221 E OKLAHOMA AVE
CITY/STATE	KNOXVILLE, TN
ZIP CODE:	37917
PHONE:	202-341-1488
EMAIL:	CSHTEYNBERG@GMAIL.COM

GENERAL CONTRACTOR:

NAME:	
CONTACT:	
LICENSE:	

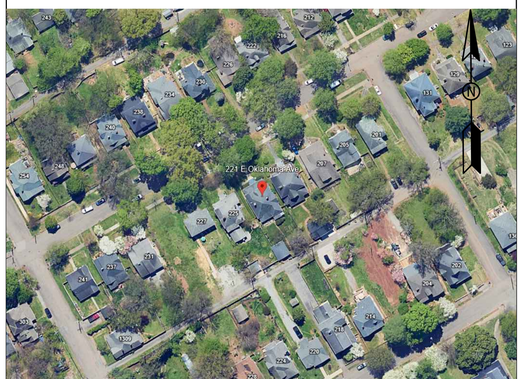
DESIGNER:

COMPANY:	DRAFT.
CONTACT:	CARLY MACKINNON
CITY/STATE	KNOXVILLE, TN
PHONE:	442-219-9507
EMAIL:	INFO@DRAFTBYCARLY.COM

DRAWING LEGEND

A0.0	COVER SHEET
A1.0	SITE PLAN
~~A2.0~~	~~FOUNDATION PLAN~~
A2.1	EXISTING FLOOR PLAN
A2.2	PROPOSED FLOOR PLAN
~~A3.0~~	~~INTERIOR ELEVATIONS~~
A3.1	EXTERIOR ELEVATIONS
~~A4.0~~	~~REFLECTED CEILING PLAN~~
A5.0	ROOF PLAN
A6.0	ELECTRICAL PLAN
~~A7.0~~	~~MECHANICAL PLAN~~
~~A8.0~~	~~ARCHITECTURAL DETAILS~~

VICINITY MAP



ADOPTED BUILDING CODES

ALL CONSTRUCTION SHALL COMPLY WITH THE ADOPTED ORDINANCES AND POLICIES OF THE GOVERNING AGENCY HAVING JURISDICTION AND THE LATEST ADOPTED EDITIONS OF THE FOLLOWING:

INTERNATIONAL RESIDENTIAL CODE	2018 IRC
INTERNATIONAL PLUMBING CODE	2018 IPC
INTERNATIONAL MECHANICAL CODE	2018 IMC
INTERNATIONAL FIRE CODE	2018 IFC
NATIONAL ELECTRICAL CODE	2017 NEC
INTERNATIONAL ENERGY CONSV. CODE	2018 IECC
INTERNATIONAL BUILDING CODE	2018 IBC

JOB CARD SHALL BE POSTED IN A CONSPICUOUS PLACE ON THE SITE AND READILY AVAILABLE FOR SIGNATURES.

DRAWING SYMBOLS

DETAIL # / DRAWING SHEET #
DETAIL KEY

ELEVATION # / DRAWING SHEET #
ELEVATION KEY

SECTION LETTER / DRAWING SHEET #
SECTION KEY

HIDDEN LINE

CENTER LINE

PHANTOM LINE

BREAK / CUT LINE

APPROVAL STAMP

ABBREVIATIONS

ALUMN.	ALUMINUM	CONC.	CONCRETE	ELEV.	ELEVATION	HC	HANDICAPPED	N.I.C.	NOT IN CONTRACT	REF.	REFRIGERATOR	ST.	STEEL	WD.	WOOD
APPROX.	APPROXIMATE	CNTR.	COUNTER	E.P.	ELECTRICAL PANEL	HDR.	HEADER	N.T.S.	NOT TO SCALE	RENF.	REINFORCED	STRUCT.	STRUCTURAL	W.H.	WATER HEATER
ARCH.	ARCHITECTURAL	(D)	DEMO	F.D.	FLOOR DRAIN	HDWD.	HARDWOOD	O.C.	ON CENTER	REQ'D.	REQUIRED	SQ. FT.	SQUARE FEET	W.I.C.	WALK-IN CLOSET
ASPH.	ASPHALT	D	DRYER	FNDN.	FOUNDATION	HTR.	HEATER	O.D.	OUTSIDE DIMENSION	R.O.	ROUGH OPENING	TEMP.	TEMPERED GLASS	WNDW.	WINDOW
BTH.	BATH	DIA.	DIAMETER	F.F.	FINISHED FLOOR	H.W.	HOT WATER	P.L.	PROPERTY LINE	S.A.	SUPPLY AIR	T.C.	TRASH COMPACTOR	WP.	WATERPROOF
BDRM.	BEDROOM	DIM.	DIMENSION	FIN.	FINISH	I.D.	INSIDE DIMENSION	PLYWD.	PLYWOOD	S.G.D.	SLIDING GLASS DOOR	TR.	TREAD		
BM	BEAM	DISP.	DISPENSER	FL	FLASHING	INSUL.	INSULATION	P.T.	PRESSURE TREATED	SHWR.	SHOWER	T.O.F.	TOP OF FLOOR		
BLKG.	BLOCKING	DN	DOWN	FLR.	FLOOR	J.B.	JUNCTION BOX	#	NUMBER	SKY.	SKYLIGHT	TYP.	TYPICAL		
BLDG.	BUILDING	DS	DOWNSPOUT	FP	FIREPLACE	KIT.	KITCHEN	RIS.	RISERS	SL.	SLOPE	U.N.O.	UNLESS NOTED OTHERWISE		
CAB.	CABINET	DW	DISHWASHER	F.R.	FIRE RATED	MAX.	MAXIMUM	R.A.V.	RETURN AIR VENT	SLDR.	SLIDER	V.I.F.	VERIFY IN FIELD		
CL	CENTER LINE	(E)	EXISTING	G.C.	GENERAL CONTRACTOR	MIN.	MINIMUM	RAD.	RADIUS	SPEC	SPECIFICATION	W	WASHING MACHINE		
CLNG.	CEILING	(ER)	EXISTING RELOCATED	GAR.	GARAGE	MTL.	METAL	RBAR.	REINFORCED STEEL BAR	S.S.D.	SEE STRUCTURAL DRAWINGS	W/	WITH		
CLST.	CLOSET	EA	EACH	GYP.	GYPSUM	(N)	NEW	R.D.	ROOF DRAIN	S.S.	STAINLESS STEEL	W/O	WITHOUT		

SHTEYNBERG ADU
221 E OKLAHOMA AVE
KNOXVILLE, TN 37917

DRAWN BY: CM

DATE: 08/04/2025

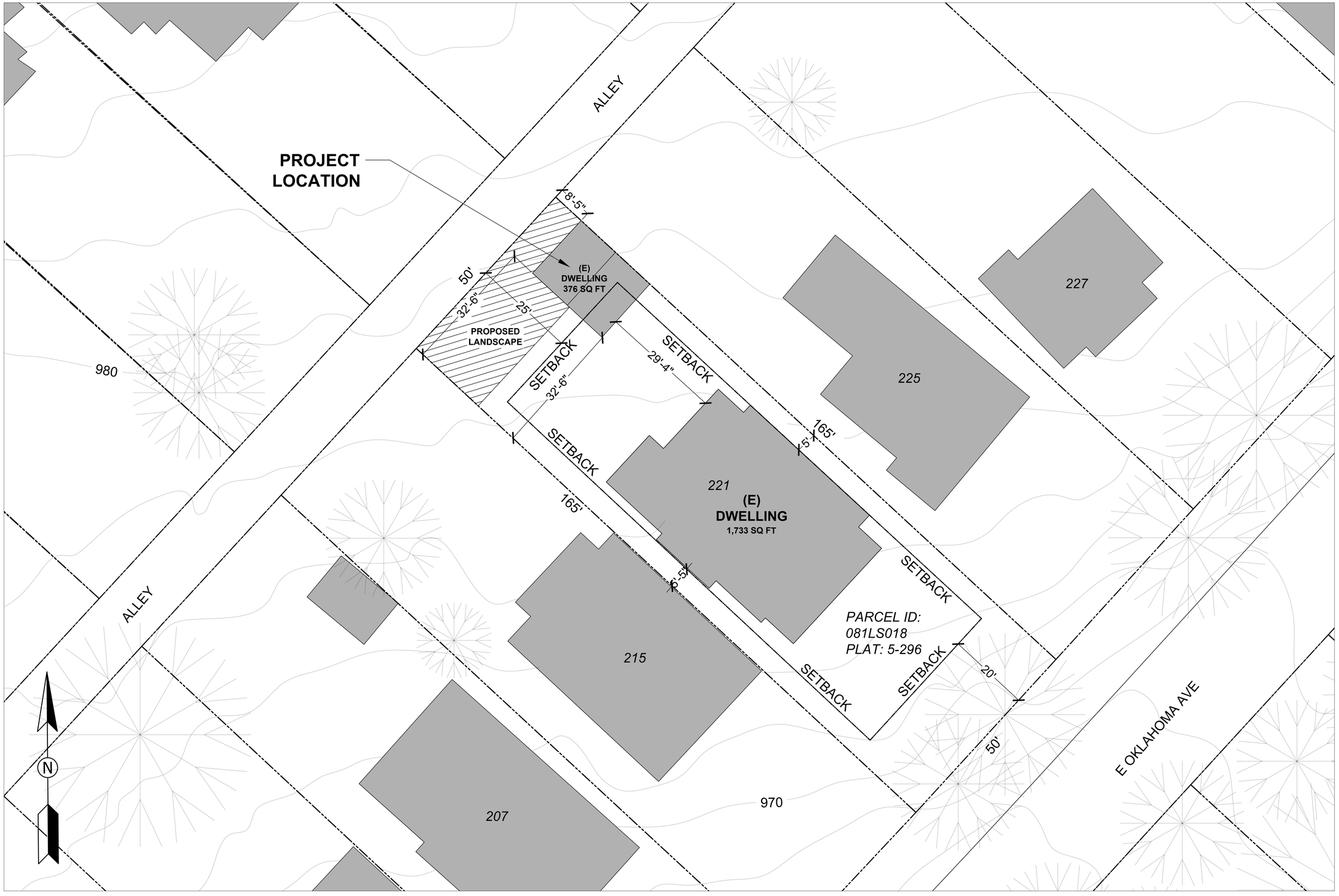
SCALE:

STAMP

SHEET

A0.0

COVER SHEET



SITE PLAN

SCALE: 3/32" = 1'-0"

NOTE: ALL LOCATIONS AND MEASUREMENTS TO BE VERIFIED BY CONTRACTOR ON SITE PRIOR TO CONSTRUCTION.

draft.

SHTEYNBERG ADU

221 E OKLAHOMA AVE
KNOXVILLE, TN 37917

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DATE: 08/04/2025

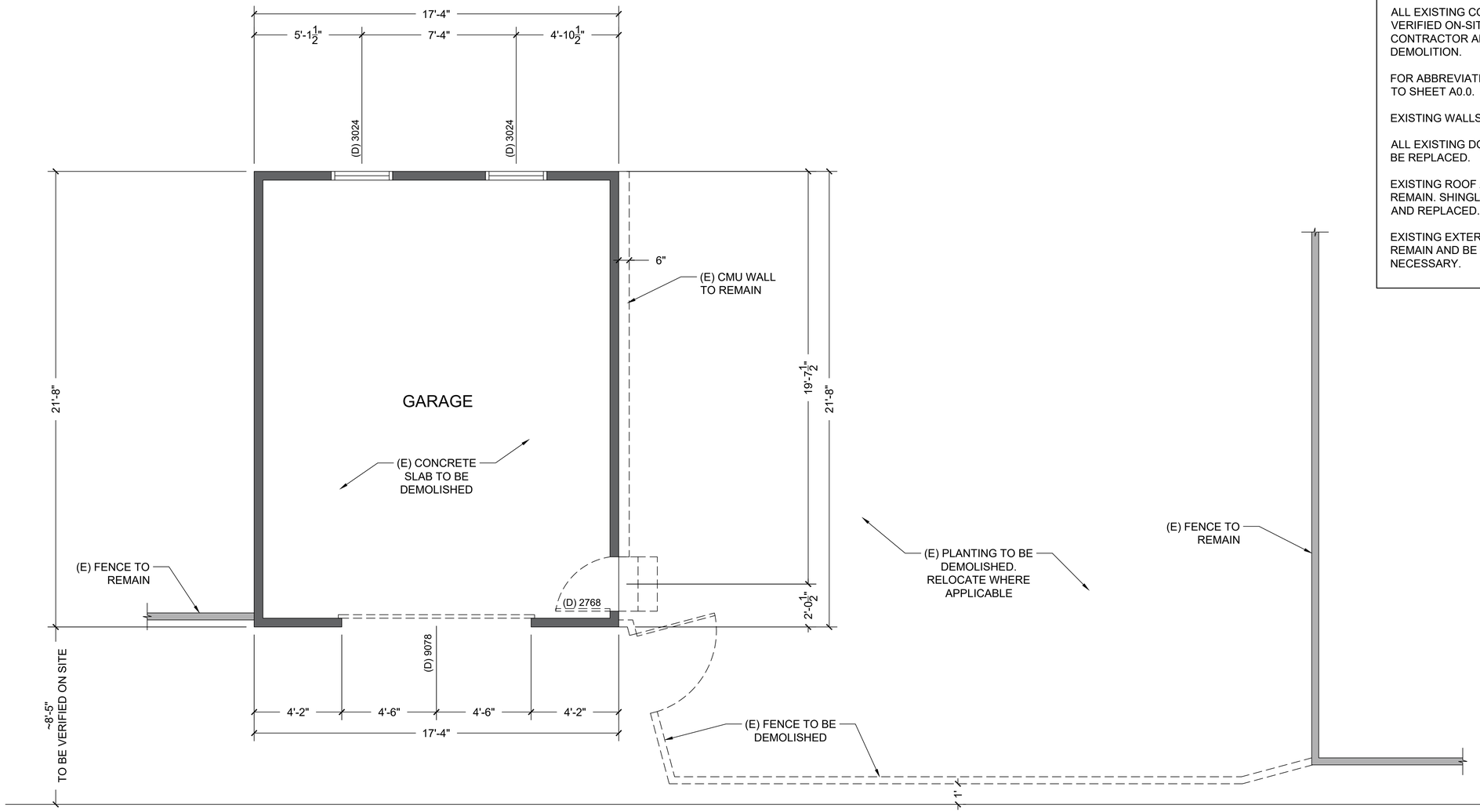
SCALE: 3/32" = 1'-0"

STAMP

SHEET

A1.0

SITE PLAN



NOTES

ALL EXISTING CONDITIONS TO BE VERIFIED ON-SITE WITH THE CONTRACTOR AND ENGINEER PRIOR TO DEMOLITION.

FOR ABBREVIATION DEFINITIONS, REFER TO SHEET A0.0.

EXISTING WALLS TO REMAIN.

ALL EXISTING DOORS AND WINDOWS TO BE REPLACED.

EXISTING ROOF AND RAFTERS TO REMAIN. SHINGLES TO BE REMOVED AND REPLACED.

EXISTING EXTERIOR WOOD SIDING TO REMAIN AND BE REPAIRED WHERE NECESSARY.

EXISTING FLOOR PLAN

376 SQ FT SCALE: 3/8" = 1'-0"

SHTEYNBERG ADU
221 E OKLAHOMA AVE
KNOXVILLE, TN 37917

DRAWN BY: CM

DATE: 08/04/2025

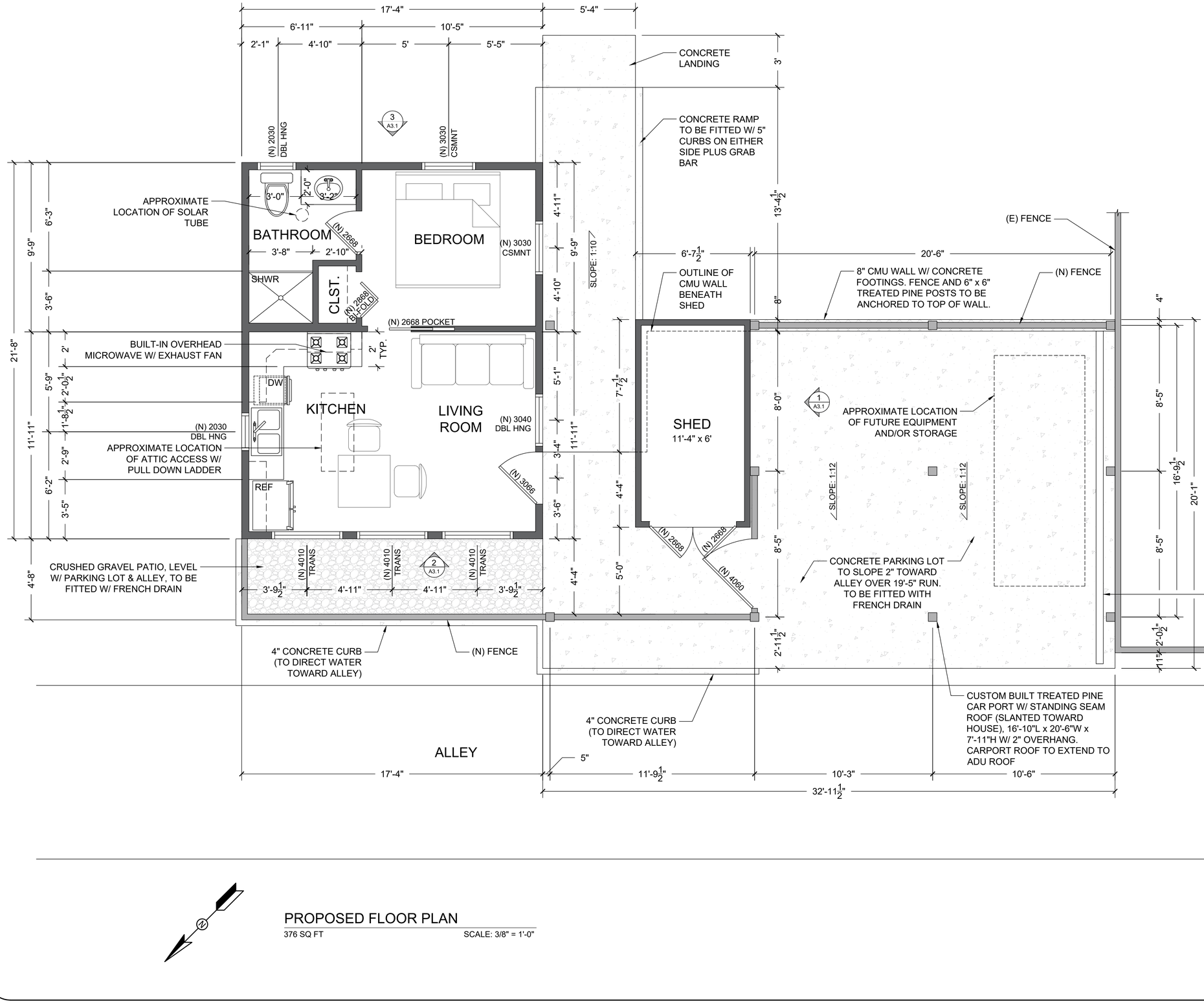
SCALE: 3/8" = 1'-0"

STAMP

SHEET

A2.1

EXISTING FLOOR PLAN



NOTES

ALL MEASUREMENTS AND GRADING TO BE VERIFIED BY CONTRACTOR ON-SITE PRIOR TO CONSTRUCTION.

FOR ABBREVIATION DEFINITIONS, REFER TO SHEET A0.0.

CONCRETE SLAB TO BE RE-POURED.

ALL INTERIOR PLUMBING WALLS TO BE 6".

ALL NON-PLUMBING INTERIOR WALLS TO BE 4".

EXISTING GARAGE CEILING TO BE CLOSED OFF WITH DRYWALL AND FINISHED AS AN 8' FLAT CEILING.

NEW ASPHALT SHINGLES TO BE INSTALLED ON EXISTING ROOF.

ADU TO BE FITTED WITH ACCESSIBILITY FEATURES THROUGHOUT.

RELOCATE EXISTING BUSHES WHERE SALVAGEABLE.

ALL NEW CONSTRUCTION TO BE FITTED WITH PROPER DRAINAGE AND BE VERIFIED ON-SITE BY CONTRACTOR.

EXISTING WOOD SIDING TO BE REPAIRED WHERE NECESSARY.

SHED SIDING TO MATCH ADU.

CONTRACTOR TO LOCATE WALL-MOUNTED WATER HEATER IN BATHROOM.

ROOF OVER CARS TO COVER SHED AND WALKWAY TO ADU.

DBL HNG = DOUBLE HUNG WINDOW

TRNSM = TRANSOM WINDOW

CSMNT = CASEMENT WINDOW

PROPOSED FLOOR PLAN

376 SQ FT SCALE: 3/8" = 1'-0"

SHTEYNBERG ADU

221 E OKLAHOMA AVE
KNOXVILLE, TN 37917

DRAWN BY: CM

DATE: 08/28/2025

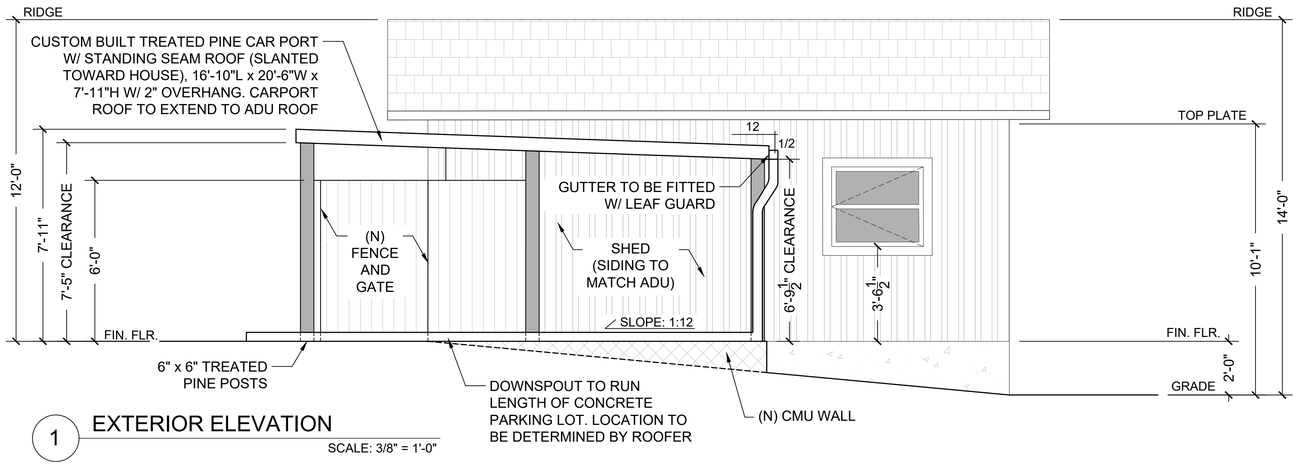
SCALE: 3/8" = 1'-0"

STAMP

SHEET

A2.2

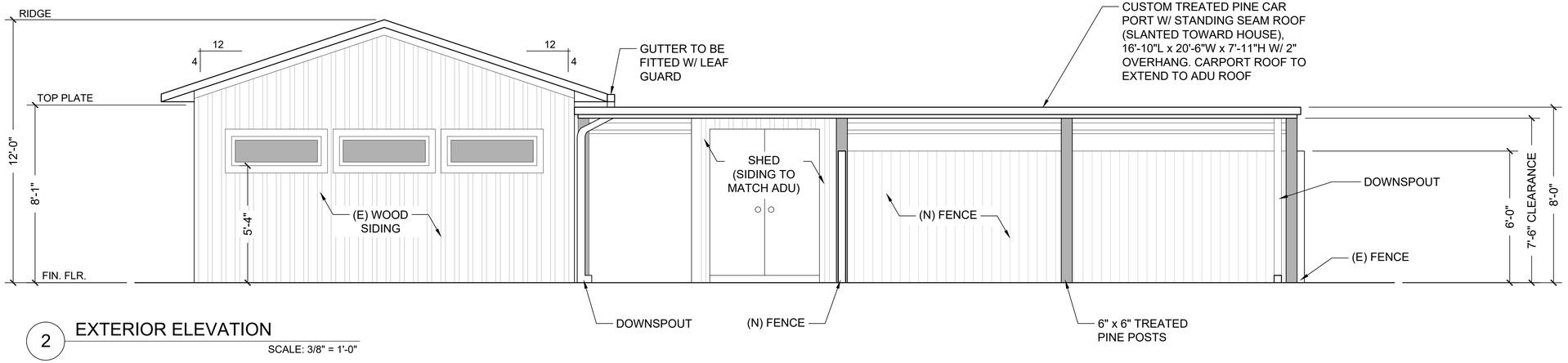
PROPOSED FLOOR PLAN



1 EXTERIOR ELEVATION

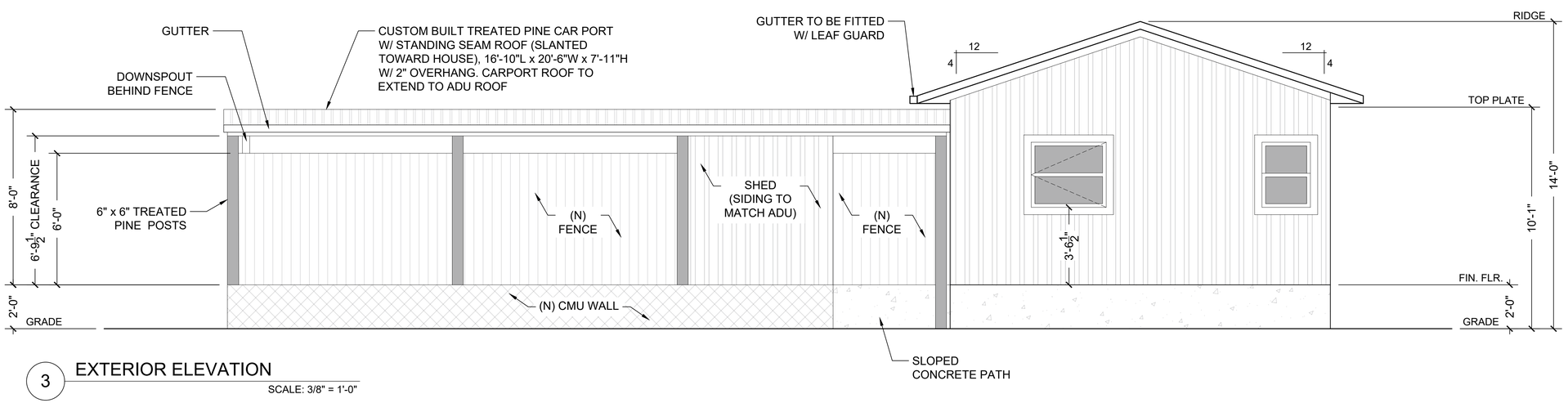
SCALE: 3/8" = 1'-0"

NOTE: ALL GRADING AND MEASUREMENTS TO BE VERIFIED BY CONTRACTOR ON SITE PRIOR TO CONSTRUCTION.



2 EXTERIOR ELEVATION

SCALE: 3/8" = 1'-0"



3 EXTERIOR ELEVATION

SCALE: 3/8" = 1'-0"

SHTEYNBERG ADU

221 E OKLAHOMA AVE
KNOXVILLE, TN 37917

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DATE: 08/28/2025

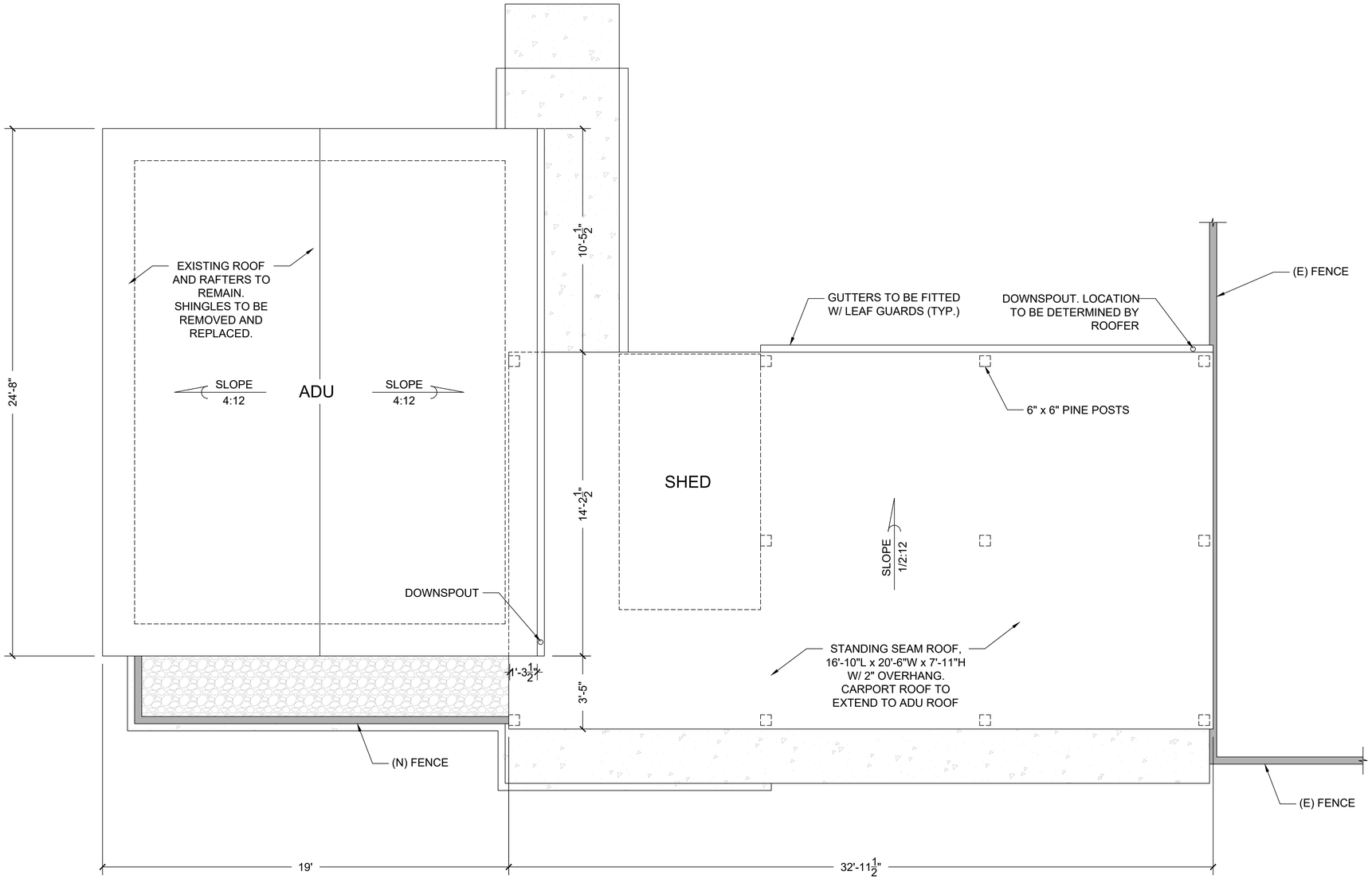
SCALE: 3/8" = 1'-0"

STAMP

SHEET

A3.1

EXTERIOR ELEVATIONS



PROPOSED FLOOR PLAN

376 SQ FT SCALE: 3/8" = 1'-0"

draft.

SHTEYNBERG ADU

221 E OKLAHOMA AVE
KNOXVILLE, TN 37917

DRAWN BY: CM

DATE: 08/28/2025

SCALE: 3/8" = 1'-0"

STAMP

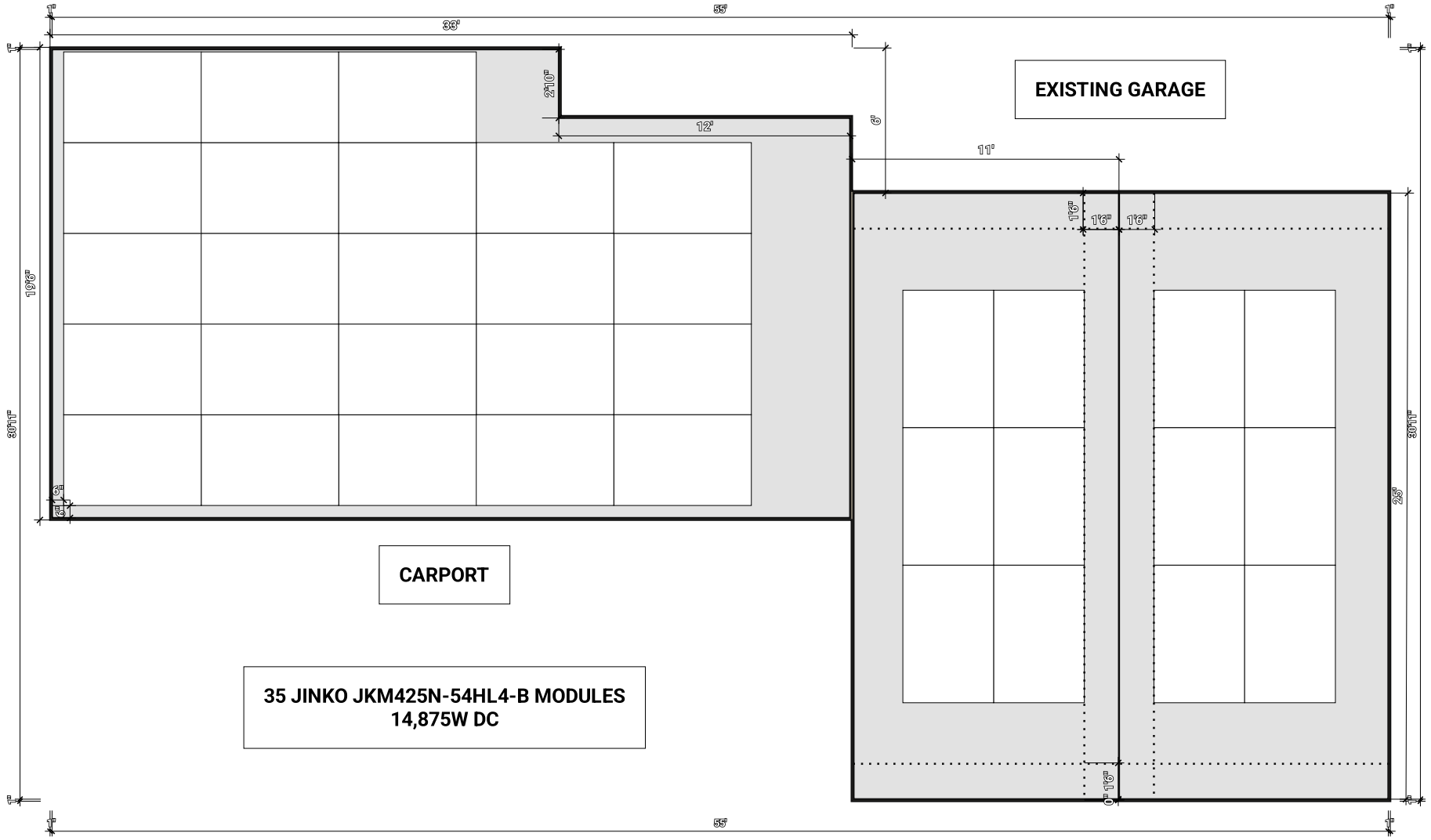
SHEET

A2.2

ROOF PLAN

Item	Description	Image
Siding	Wood siding patching to match existing	
Carport Columns	Cedar columns, 6x6	
Roofing	New asphalt shingles to match primary residence Dark Metal roof	
Fence	Match existing wood fence	
Windows	Wood windows to match existing	
Doors	Match existing	

221 EAST OKLAHOMA ADU SOLAR ROOF LAYOUT



Outlook

Re: 221 E Oklahoma Ave - HZC staff review

From Ethan Fields <efields@fetconstruction.com>
Date Wed 8/20/2025 2:08 PM
To Malynda Wollert <malynda.wollert@knoxplanning.org>
Cc Mike Reynolds <mike.reynolds@knoxplanning.org>

8 attachments (7 MB)

IronRidge_Cut_Sheet_FlashFoot2.pdf; IronRidge_Cut_Sheet_XR100_Rail.pdf; IronRidge_FlashFoot2_Tech_Brief.pdf; IronRidge_Cut_Sheet_L-Foot.pdf; IronRidge_FlashFoot2_Installation_Manual.pdf; s-5-n-1-5-clamps-brochure.pdf; ZZ299200092_DS.pdf; s-5-n-1-5-and-mini-installation.pdf;

Malynda,

I have attached all the specs he shared with me. Below is also a copy of the email he sent me. Long story short, they will not protrude more than 7". Let me know if you have any questions!

Ethan,

I have attached the spec sheets for all of the major components that will be installed on the roof planes.

The standing seam roof on the carport will be utilizing the S-5! S-5-N clamp (or some variation based upon the exact standing seam model), the IronRIdge L Foot, the IronRidge XR100 Rail, and the Jinko 425W solar module.

The ADU roof will incorporate the IronRidge FlashFoot 2 kit, IronRidge XR100 rail, and the Jinko 425W solar module.

There will be additional components like grounding lugs, bare copper grounding conductor, end clamps, mid clamps, and an assortment of wire maintenance clips, etc.

The arrays will stand off parallel to the roof plane no more than about 4"-7" (which is a minimum design standard for air flow and efficiency) and incorporate a distributed weight load of approximately 3 PSF.

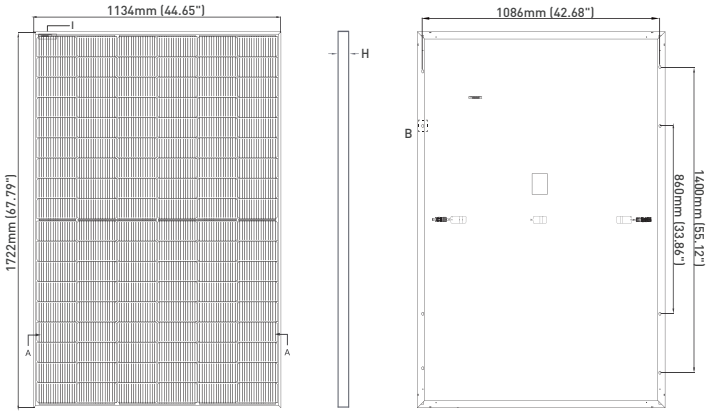
Let me know if you need additional info.

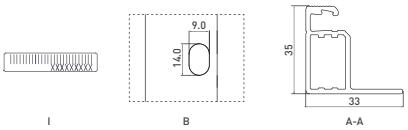
Ethan Fields
Estimating Manager

F.E. Trainer Construction, Inc.

ENGINEERING DRAWINGS

Front Side Back





Length: ± 2mm
Width: ± 2mm
Height: ± 1mm
Row Pitch: ± 2mm

MECHANICAL CHARACTERISTICS

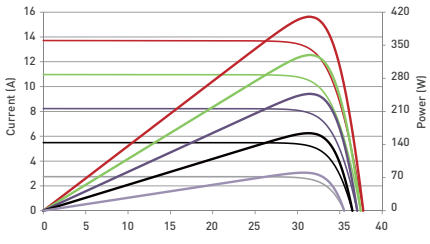
No. of Half Cells	108 (2 x 54)
Dimensions	1722 × 1134 × 35mm (67.79 × 44.65 × 1.38 inch)
Weight	22.0kg (48.5lbs)
Front Glass	3.2mm, Anti-Reflection Coating High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP68 Rated
Output Cables	12 AWG, 1400mm (55.12in) or Customized Length
Connector	Staubli MC4
Fire Type	Type 1
Pressure Rating	5400Pa (Snow) & 2400Pa (Wind)

TEMPERATURE CHARACTERISTICS

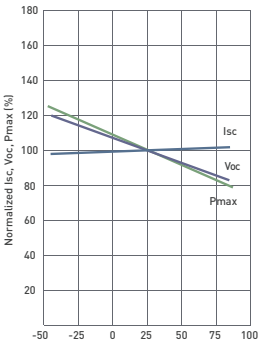
Temperature Coefficients of Pmax	-0.29%/°C
Temperature Coefficients of Voc	-0.25%/°C
Temperature Coefficients of Isc	0.045%/°C
Nominal Operating Cell Temperature (NOCT)	45±2°C

ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE

Current-Voltage & Power-Voltage Curves (440W)



Temperature Dependence of Isc, Voc, Pmax



MAXIMUM RATINGS

Operating Temperature (°C)	-40°C~+85°C
Maximum System Voltage	1000VDC
Maximum Series Fuse Rating	25A

PACKAGING CONFIGURATION

(Two pallets = One stack)

31pcs/pallets, 62pcs/stack, 806pcs/40 HQ Container

WARRANTY

25-year product and 30-year linear power warranty

1st year degradation not to exceed 1%, each subsequent year not to exceed 0.4%, minimum power at year 30 is 87.4% or greater.

ELECTRICAL CHARACTERISTICS

Module Type	JKM420N-54HL4-B		JKM425N-54HL4-B		JKM430N-54HL4-B		JKM435N-54HL4-B		JKM440N-54HL4-B	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	420Wp	316Wp	425Wp	320Wp	430Wp	323Wp	435Wp	327Wp	440Wp	331Wp
Maximum Power Voltage (Vmp)	32.16V	29.95V	32.37V	30.19V	32.58V	30.30V	32.78V	30.50V	32.99V	30.73V
Maximum Power Current (Imp)	13.06A	10.55A	13.13A	10.60A	13.20A	10.66A	13.27A	10.72A	13.34A	10.77A
Open-circuit Voltage (Voc)	38.74V	36.80V	38.95V	37.00V	39.16V	37.20V	39.36V	37.39V	39.57V	37.59V
Short-circuit Current (Isc)	13.51A	10.91A	13.58A	10.96A	13.65A	11.02A	13.72A	11.08A	13.80A	11.14A
Module Efficiency STC (%)	21.51%		21.76%		22.02%		22.28%		22.53%	

***STC:** Irradiance 1000W/m² Cell Temperature 25°C AM = 1.5
NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM = 1.5 Wind Speed 1m/s

*Power measurement tolerance: ±3%

The company reserves the final right for explanation onany of the information presented hereby. JKM420-440N-54HL4-B-F1-US

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