861-E N Dean Road
Auburn, AL 36830
P: 360.566.7343

STRUCTURAL CALCULATIONS

PREPARED FOR

TARHEEL BASEMENT SYSYEMS

FOR

GARDNER RESIDENCE

FOUNDATION REPAIR

1047 S LINCOLN ST

COATS, NORTH CAROLINA

PROJECT NUMBER: 23.136.TBR

DATE: December 12, 2023

PROJECT MANAGER: Shane Adams, P.E.

COA: C-4876

Digitally signed by Shane Adams
Date: 2023.12.12 13:30:53-05'00'

861-E N Dean Road
Auburn, AL 36830
P: 360.566.7343

December 12, 2023

Project No.:23.136.TBR

Tarheel Basement Sysyems
3333 Air Park Road
Fuquay-Varina, North Carolina 27526

RE: Foundation Repair - 1047 S Lincoln St, Coats, North Carolina

PROJECT BACKGROUND

We understand the structure is a single-family residence and has experienced settlement at the interior of the structure. A recent field sketch (attached) indicates the approximate locations of repair. It is our understanding a S4x7.7 supplemental beam and (3) Intellijack systems have been proposed to provide additional framing support.

Image 1: Front Elevation

GEOLOGIC SETTING

The existing structure is located in Coats, North Carolina. Based on the information provided by the USDA Web Soil Survey, the general site condition in the area is comprised of sandy clay loam and the site is relatively flat. We believe suitable support can be achieved by installing Intellijacks.

SUMMARY

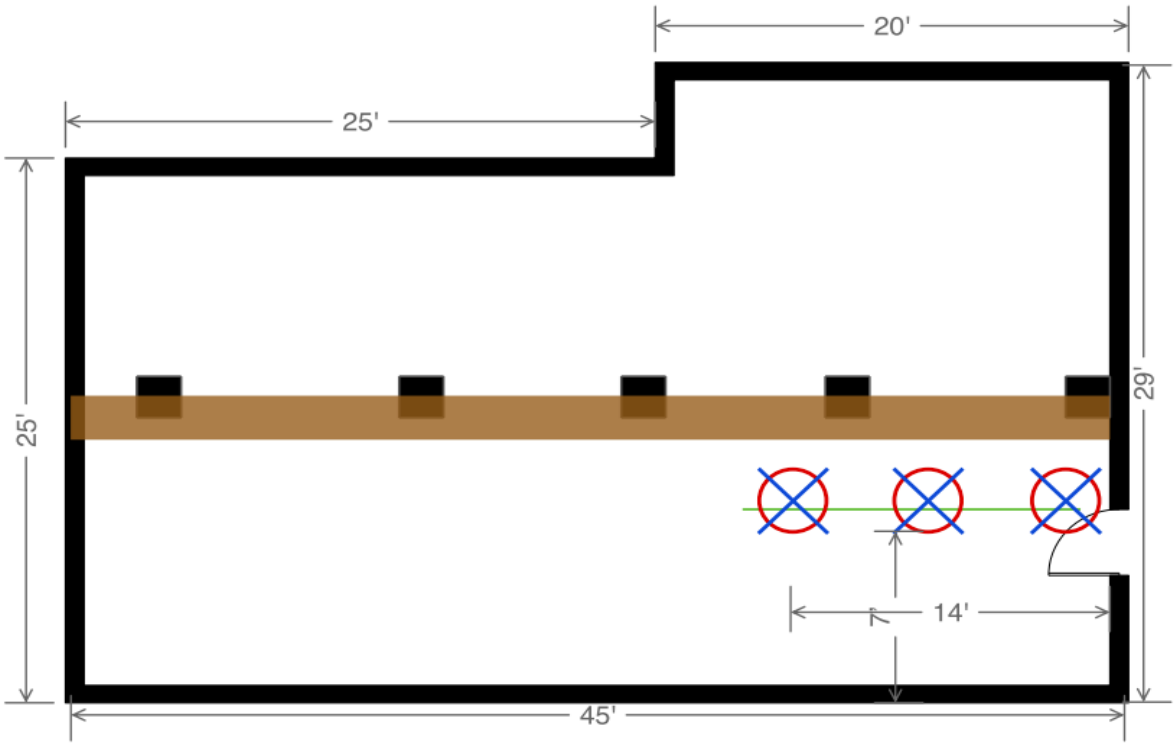
The design load requirement for the Intellijacks is 3000 lbs, and based on the technical manual for the Intellijack system, this is acceptable as the allowable load is 24100 lbs.

Regards,

Shane Adams

Shane Adams, P.E.
Stark Foundations

FIELD SKETCH



Back

STARK FOUNDATIONS

PROJECT

Foundation Repair
1047 S Lincoln St
Coats, North Carolina

Date: 12-Dec-23
Designed by: JMR

Project No.: 23.136.TBR

Design Criteria

Code(s):

2018 North Carolina State Building Code
International Building Code (IBC) 2015
ASCE 7-10

Design Loads:

Dead:

Roof =	15	psf
Chimney =	45	psf
Third Floor =	15	psf
Second Floor =	15	psf
First Floor =	15	psf
Walls =	45	psf
8" Foundation Wall =	100	psf
Soil =	110	psf

Soil:

Allow Lateral Bearing Pressure =	100	psf/ft
Active Pressure =	60	psf/ft

Live:

Roof (Snow) =	15	psf	
Roof Live Load =	20	psf	governs
Third Floor =	40	psf	
Second Floor =	40	psf	
First Floor =	40	psf	

Wind: (not applicable)

Exposure =	C		Risk Category =	II	
Wind Speed, V =	118	mph	K_{zt} =	1	
Gust Factor, G =	0.85		K_d =	0.85	
Int. Pressure Coefficient, GC_{pi} =	-0.18		K_z =	1	
Ext. Pressure Coefficient, Cp =	0.8		Height, h_z =	30	ft

Design Wind Pressure:

Design Load Combo = D + 0.6W

where: $p_w = q_z (GCp - GC_{pi})$ ω = 0.6

$q_z = 0.00256 K_z K_{zt} K_d V^2$

Therefore:

q_z = 30.3 psf

p_w = 26.1 psf

Factored Wind Pressure, p'_w = 15.6 psf (say 16 psf)

STARK FOUNDATIONS

PROJECT

Foundation Repair
1047 S Lincoln St
Coats, North Carolina

Date: 12-Dec-23
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Intellijack Design - Worst Case

Vertical Design Loads:

Tributary Widths:

Dead:

Roof =	0	ft	------->	0	plf
Third Floor =	0	ft	------->	0	plf
Second Floor =	0	ft	------->	0	plf
First Floor =	7	ft	------->	105	plf
Walls =	0	ft	------->	0	plf
Foundation Wall (height) =	0	ft	------->	0	plf
Soil (height) =	0	ft	------->	0	plf
			ΣDL =	105	plf

Live:

Roof (live) =	0	ft	------->	0	plf
Third Floor =	0	ft	------->	0	plf
Second Floor =	0	ft	------->	0	plf
First Floor =	7	ft	------->	280	plf
			ΣLL =	280	plf

Max Pier Spacing or Trib = 6 ft

Pier Working Loads:

P_{DL} =	630	lbs	
P_{LL} =	1680	lbs	
Working Load, P_{TL} =	3000	lbs	(ASCE 7-16 Load Combo 2 Governs)

Pier Type: Intellijack

Intellijack Column: Allowable Compression for system heights up to 9ft = 24.1 kips

Footing Check:

footing type = gravel

length = 24 in width = 24 in depth = 12 in

footing size (LxWxH) = 24in x 24in x 12in Allowable Bearing Pressure = 1500 psf

soil pressure = 750 psf <1500 psf A_{FTG} = 4.00 ft^2

therefore, 24in x 24in x 12in footing OK

Beam : **S4x7.7**

Analysis of Section:

Max. Span = 6 ft Allowable Dist. Load = 1200 plf

DL + LL = 385 plf ok

Max. Cantilever = 1 ft Span / 2 = 3 ft ok

STARK
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AUBURN, AL 36830
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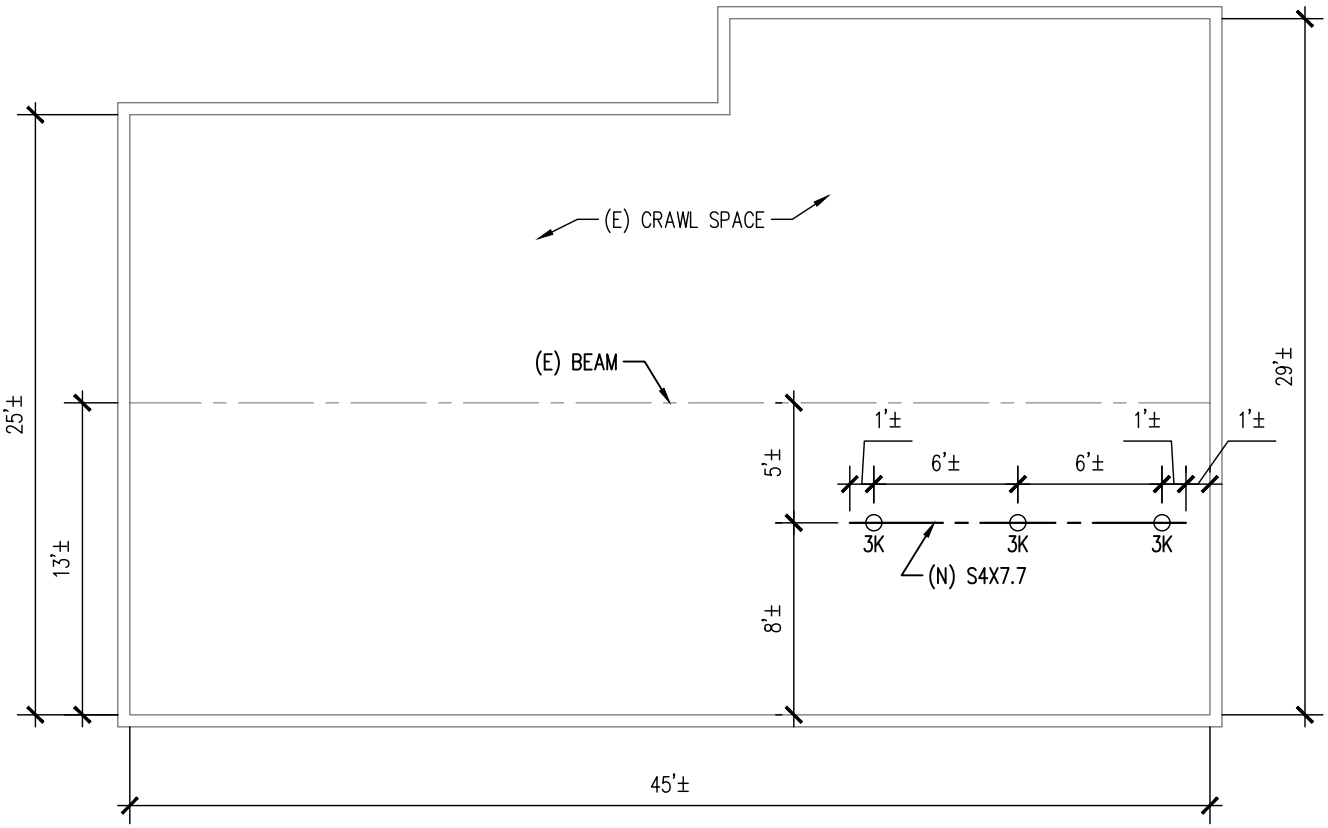
FRONT OF HOME



LEGEND	
○ 10K	INDICATES INTELLIJACK & UNFACTORED DESIGN LOAD (KIPS) SEE DETAIL 1/S2.0
	INDICATES (E) CMU PIER

1 FOUNDATION REPAIR PLAN

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

STAMP

NORTH CAROLINA PROFESSIONAL SEAL 054665 ENGINEER SHANE C. ADAMS

Digitally signed by Shane Adams
Date: 2023.12.12 13:31:04-05'00'

PROJECT

FOUNDATION REPAIR
GARDNER RESIDENCE
1047 S LINCOLN ST
COATS, NC

CLIENT

TAR HEEL
BASEMENT SYSTEMS
3333 AIR PARK ROAD
FUQUAY-VARINA, NC

FRONT ELEVATION

NO	REVISIONS	BY	DATE

ISSUED:	12.12.23	PROJ NO.:	23.136.TBR
DRAWN BY:	TLD	CHECKED BY:	SA

SHEET TITLE

FDN REPAIR PLAN

SHEET NUMBER

S1.0

STARK
FOUNDATIONS
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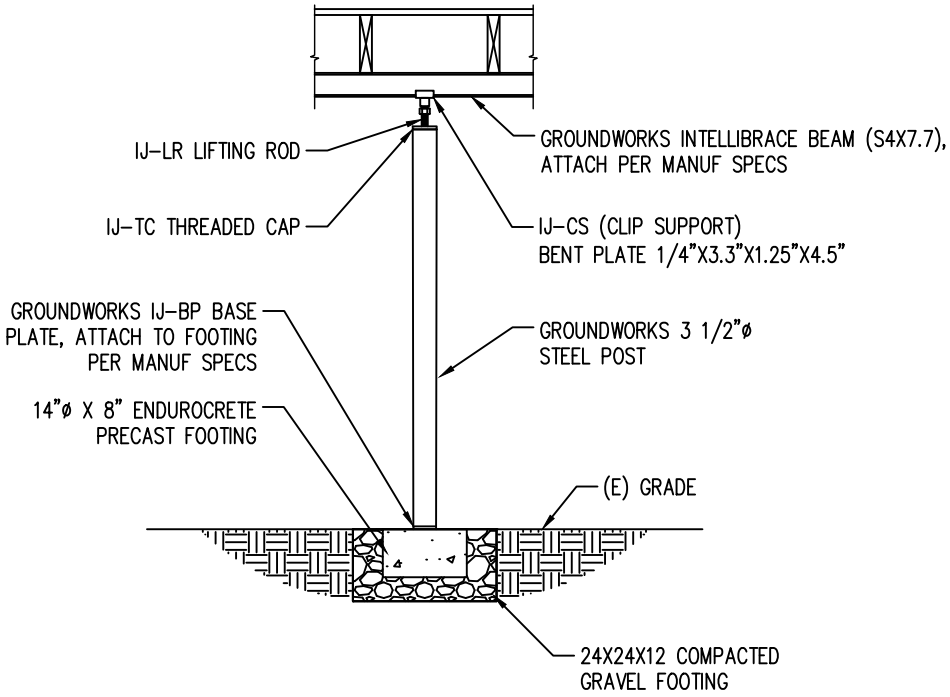

1 INTELLIJACK POST
SCALE: 3/8"=1'-0"

NOTES:
1. HOUSE TO REMAIN UNOCCUPIED DURING THE REPLACEMENT OF EXISTING POSTS W/ NEW INTELLIJACK POSTS.

STAMP

NORTH CAROLINA PROFESSIONAL SEAL 054665 ENGINEER SHANE C. ADAMS

Digitally signed by Shane Adams
Date: 2023.12.12 13:30:59-05'00'

PROJECT

FOUNDATION REPAIR
GARDNER RESIDENCE
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FRONT ELEVATION

NO	REVISIONS	BY	DATE

ISSUED:	12.12.23	PROJ NO.:	23.136.TBR
DRAWN BY:	TLD	CHECKED BY:	SA

SHEET TITLE

DETAILS

SHEET NUMBER

S2.0