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

STRUCTURAL CALCULATIONS

PREPARED FOR

TARHEEL BASEMENT SYSTEMS

FOR

POPE RESIDENCE

FOUNDATION REPAIR

757 BAILEY RD

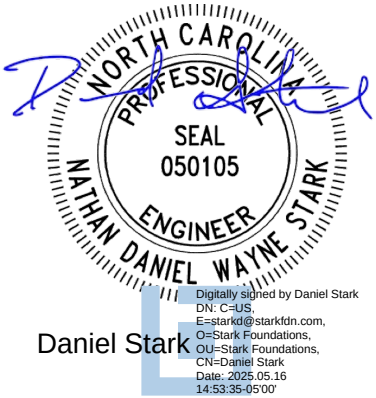
COATS, NORTH CAROLINA

PROJECT NUMBER: 25.154.TBR

DATE: May 16, 2025

PROJECT MANAGER: Daniel Stark, P.E.

COA: C-4876



Daniel Stark

Digitally signed by Daniel Stark
DN: C=US, E=starkd@starkfdn.com, O=Stark Foundations, OU=Stark Foundations, CN=Daniel Stark
Date: 2025.05.16 14:53:35-05'00'

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

May 16, 2025

Project No.:25.154.TBR

Tarheel Basement Systems
3333 Air Park Rd
Fuquay-Varina, North Carolina 27526

RE: Foundation Repair - 757 Bailey Rd, Coats, North Carolina

PROJECT BACKGROUND

We understand the structure is a single-family residence and the owner wishes to provide additional framing support. It is our understanding (10) Intellijack systems have been recommended by the contractor. A recent field sketch (attached) indicates the proposed locations of repair.

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 loam and the site is gently sloping.

SUMMARY

Based on our scope of work, determing the design load, the design load requirement for the Intellijacks is 4000 lbs, and based on the technical manual for the Intellijack system, this is acceptable as the allowable load is 24100 lbs.

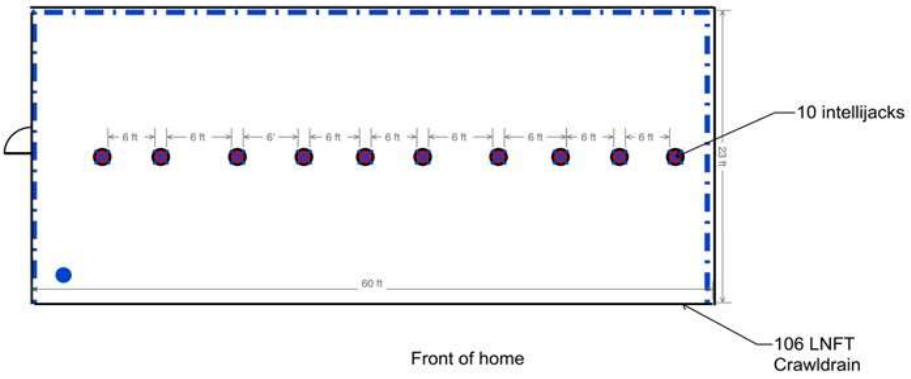
Regards,

Daniel Stark, P.E.
Stark Foundations

CONTRACTOR-PROVIDED FIELD SKETCH

Ryan keefer
8005 knightdale blvd,
Knightdale NC
984-389-7228

James pope
757 bailey road coats, NC
27521
910-808-7009



STARK FOUNDATIONS

PROJECT

Foundation Repair
757 Bailey Rd
Coats, North Carolina

Date: 16-May-25
Designed by: SHA

Project No.: 25.154.TBR

Design Criteria

Code(s):

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

Design Loads:

Dead:

Roof =	15	psf
Chimney =	45	psf
Third Floor =	15	psf
Second Floor =	15	psf
First Floor =	15	psf
Walls =	12	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
757 Bailey Rd
Coats, North Carolina

Date: 16-May-25
Designed by: SHA

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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 =	11.5	ft	------->	172.5	plf
Walls =	0	ft	------->	0	plf
Foundation Wall (height) =	0	ft	------->	0	plf
Soil (height) =	0	ft	------->	0	plf
			ΣDL =	172.5	plf

Live:

Roof (live) =	0	ft	------->	0	plf
Third Floor =	0	ft	------->	0	plf
Second Floor =	0	ft	------->	0	plf
First Floor =	11.5	ft	------->	460	plf
			ΣLL =	460	plf
Max Pier Spacing or Trib =	6	ft			

Pier Working Loads:

P_{DL} =	1035	lbs	
P_{LL} =	2760	lbs	
Working Load, P_{TL} =	4000	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:

Allowable Bearing Pressure = 1500 psf

Footing Type	Length (in)	Width (in)	Depth (in)	A_{FTG} (ft²)	Soil Pressure (psf)	
CIP Concrete	24	24	12	4	1000	<1500 psf OK
Gravel	24	24	12	4	1000	<1500 psf OK
Endurocrete IJ-IC	24	24	12	4	1000	<1500 psf OK
-	-	-	-	-	-	

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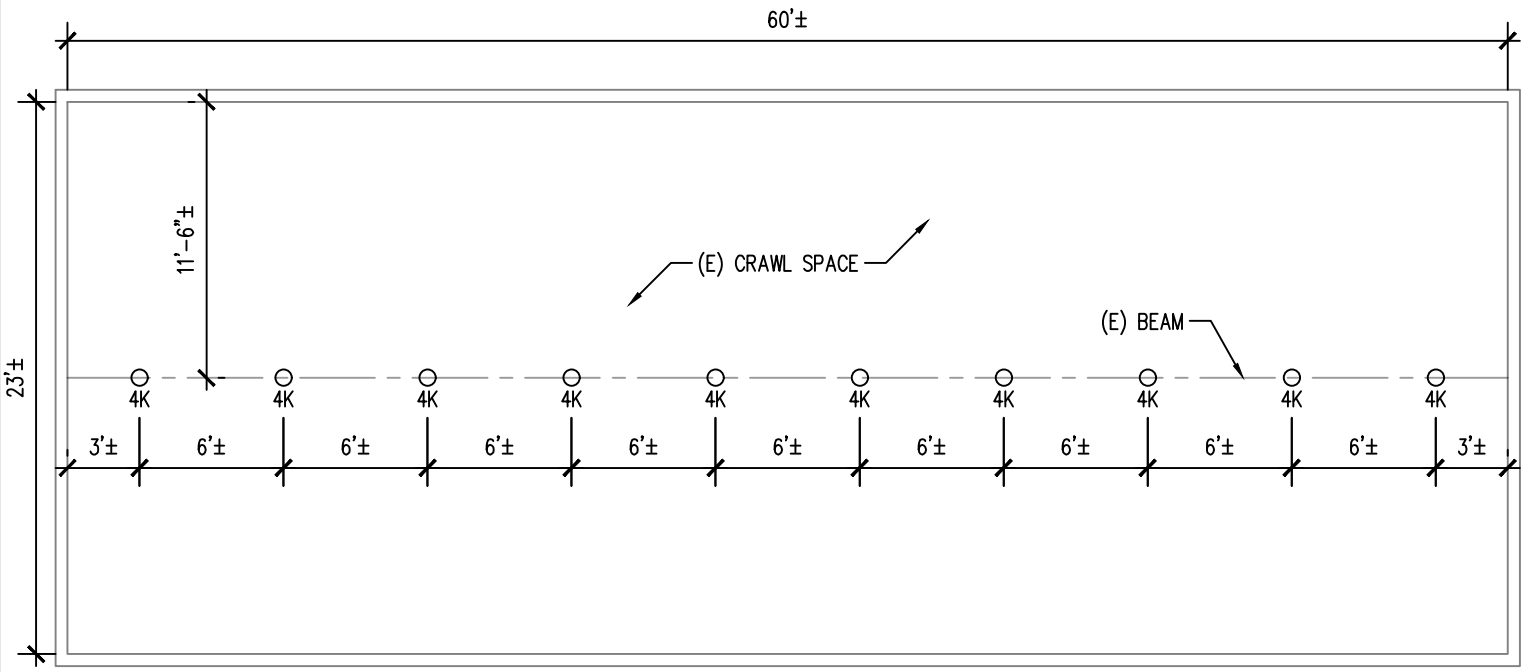

LEGEND	
○ 10K	INDICATES INTELLIJACK & UNFACTORED DESIGN LOAD (KIPS) SEE DETAIL 1/S2.0

1 FOUNDATION REPAIR PLAN

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

PLAN NOTES:

1. FIELD VERIFY ALL DIMENSIONS PRIOR TO STARTING CONSTRUCTION. NOTIFY STARK FOUNDATIONS OF ANY DISCREPANCIES.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE STRUCTURAL STABILITY OF ALL NEW AND EXISTING STRUCTURES DURING CONSTRUCTION. THIS INCLUDES, BUT NOT LIMITED TO, EXCAVATIONS, COLUMNS, EQUIPMENT LOADS, MATERIAL LOADS, AND OTHERS. BRACING AND SHORING IS TO BE INSTALLED PER THE LATEST OSHA STANDARDS. THE DESIGN AND OBSERVATIONS BY STARK FOUNDATIONS DO NOT INCLUDE INSPECTIONS OF TEMPORARY LOADING AND STABILITY DURING CONSTRUCTION.

STAMP

NORTH CAROLINA PROFESSIONAL SEAL 050105 ENGINEER NATHAN DANIEL WAYNE STARK

PROJECT

FOUNDATION REPAIR
POPE RESIDENCE
757 BAILEY RD
COATS, NC

CLIENT

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

FRONT ELEVATION

NO	REVISIONS	BY	DATE

ISSUED:	05.16.25	PROJ NO.:	25.154.TBR
DRAWN BY:	SHA	CHECKED BY:	ACS

SHEET TITLE

FDN REPAIR PLAN

SHEET NUMBER

S1.0

NOTES:

1. HOUSE TO REMAIN UNOCCUPIED DURING THE REPLACEMENT OF EXISTING POSTS W/ NEW INTELLIJACK POSTS.
2. SUPPLEMENTAL/REPLACEMENT WOOD TO BE SOUTHERN PINE/DOUGLAS FIR, NO.2.
3. CAPACITY ASSUMES AN ALLOWABLE SOIL BEARING PRESSURE OF 1500 PSF.
4. CONCRETE COMPRESSIVE STRENGTH, F_c' = 2,500 PSI.
5. BOTTOM OF FOOTING SHALL NOT BE LESS THAN THE FROST DEPTH.

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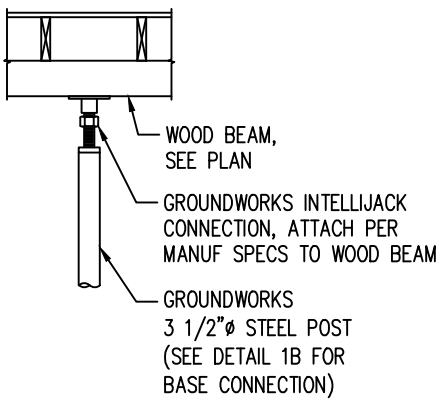
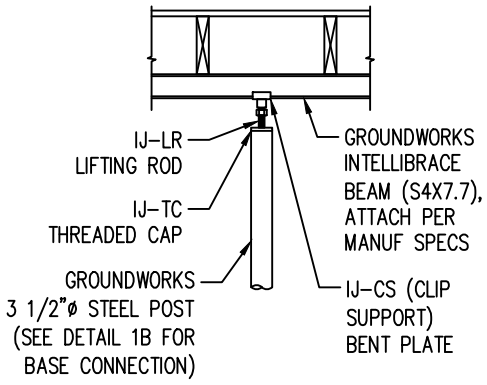
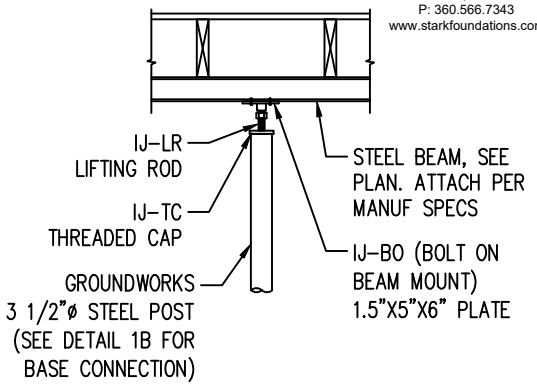


1A.A: FLAT PLATE W/ WOOD BEAM



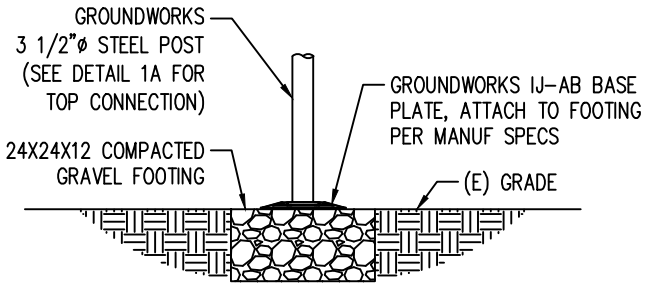
1A.B: BENT PLATE W/ STEEL BEAM



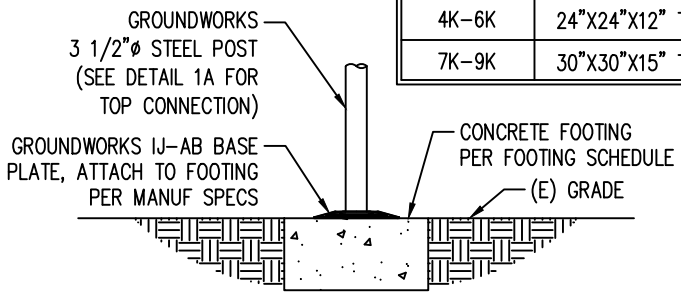
1A.C: FLAT PLATE W/ STEEL BEAM

1A: INTELLIJACK TOP CONNECTIONS

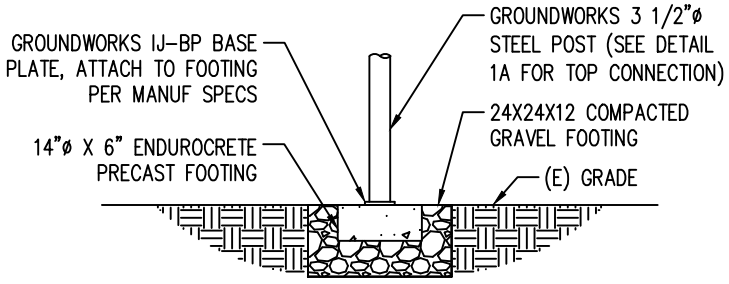
CONCRETE FOOTING SCHEDULE	
DESIGN LOAD	SIZE
1K-3K	18"X18"X10" THK
4K-6K	24"X24"X12" THK
7K-9K	30"X30"X15" THK



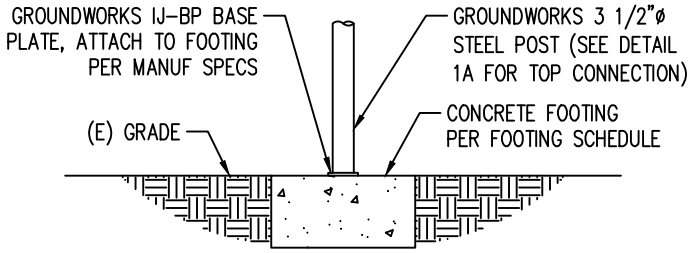
1B.A: BASE PLATE W/ GRAVEL FOOTING



1B.B: IJ-AB BASE PLATE W/ CONCRETE FOOTING



1B.C: ENDURO WHEEL W/ GRAVEL FOOTING



1B.D: IJ-BP BASE PLATE W/ CONCRETE FOOTING

1B: INTELLIJACK BASE CONNECTIONS

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

STAMP

NORTH CAROLINA PROFESSIONAL SEAL 050105 ENGINEER NATHAN DANIEL WAYNE STARK

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SHEET TITLE

DETAILS

SHEET NUMBER

S2.0