Date: May 16, 2025

Project: Gunn Property (Church)

Address: 2685 Wire Rd
Erwin, NC 28339

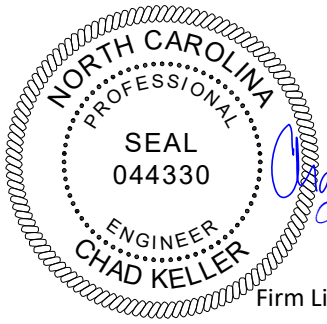
Floor Support Systems Analysis

This report is prepared for Southeast Foundation Repair (contractor) by FDN Engineering (engineer). SmartJacks and new wood framing are proposed for installation at the above referenced project. The floor support system is intended to stabilize and potentially lift the existing floor structure – reducing deflections in the floor and supporting the vertical loads tributary to the support. Load requirements for the systems were calculated at areas shown on the repair plan. Engineer performed design for this project - see page 2 for engineering notes and results. See pages 3-5 for details of the floor support systems. See page 6 for a repair plan of the floor support systems on the structure.

To the best of my professional knowledge, the design of the floor support systems meets the structural requirements of the 2018 North Carolina State Building Code to the extent that it applies to our scope of work. Engineer is retained in a limited capacity for this project. No responsibility and/or liability is assumed by, nor shall be assigned to engineer for items beyond the proposed scope as shown herein.

Upon completion of the floor support systems, the contractor shall supply engineer a log of the installed repairs, as well as photos of completed work. Engineer will evaluate the field data and prepare a letter of completion, if necessary.

FDN Engineering, PLLC
2412 N 179th St.
Omaha, NE 68116
(402) 739-9642



Chad Keller 05/16/2025

Firm License # P-2438

This item has been digitally signed and sealed by Chad A. Keller, P.E. on the date adjacent to the seal.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.
2025.05.16 12:54:11-05'00'

SmartJack Project Notes (contractor to inform engineer if discrepancies are found):

A.1 Structure is one-story, commercial with wood-frame floors.

A.2 Soil load bearing capacity at the site is a minimum of 1500 psf, based on observation.

A.3 Contractor shall use SmartJack model size SJQA350. Reference UES Evaluation Report 713.

A.4 SmartJacks and supported beams do not carry interior load-bearing walls or columns.

A.5 Contractor will install footings, SmartJacks, supplemental beams and all related components per the support manufacturer's installation instructions and according to their technical specs.

A.6 Contractor to select support base plate from the details shown herein (based on field conditions).

A.7 The design assumes the original structure was constructed of conventional means and methods.

A.8 Where supplemental beams are specified, use HSS 4.5"x3.5" tube x 0.135" wall (ASTM A500 Gr. C).

A.9 Supporting a cantilever requires the beam to be continuous over the SmartJack support. The length of the cantilever may be up to the lesser of 50% of the adjacent beam span or 30 inches.

SmartJack Analysis and Results:

B.1 Interior floor design load is 55 psf nominal load (15 psf DL + 40 psf LL), per Code.

B.2 SmartJacks are designed to support axial compression load only; with a max height of 10'-0".

B.3 Total load calculated on a SmartJack post is **2,700 lbs.**

B.4 SmartJack spacing along the supported beam (or tributary length) is typically 6'-0" O.C. (to nearest new or existing support) and shall not exceed 8'-0" O.C. unless noted otherwise on plans.

B.5 The allowable load capacity of a SmartJack post and footing is 6,000 lbs.

B.6 Locate supplemental beam in the middle one-third of the joist span, unless noted otherwise on plans. Place to best support framing and limit floor deflection.

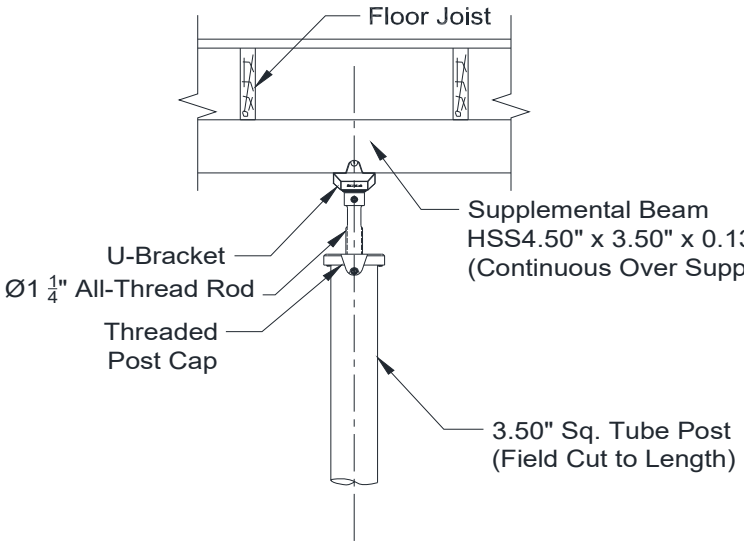
FDN Engineering, PLLC
2412 N 179th St.
Omaha, NE 68116
(402) 739-9642

NORTH CAROLINA PROFESSIONAL SEAL 044330 ENGINEER CHAD KELLER

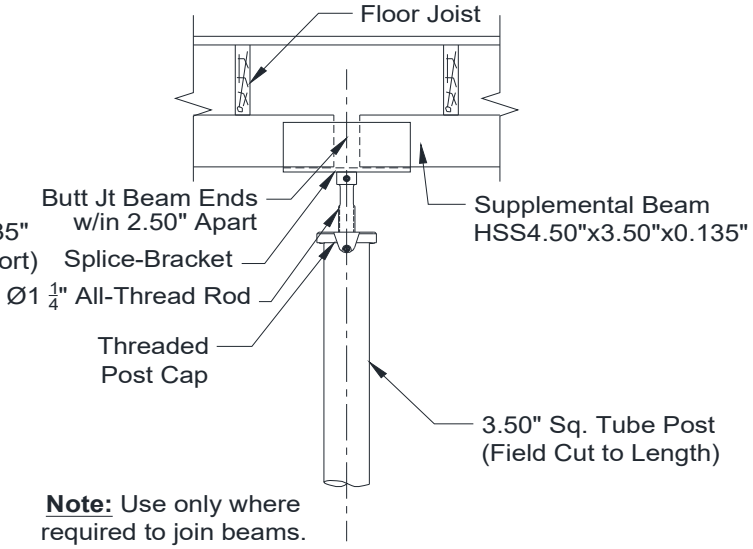
Chad Keller 05/16/2025

Firm License # P-2438

SmartJack Top Support Detail: Shown here is the SmartJack post top half and beam that supports the floor structure. All details shown are acceptable. See repair plan for location and orientation of beam. See manufacturer's tech. specs. and evaluation report for more information.



U-Bracket
New Supplemental SmartJack Beam



Splice Bracket
New Supplemental SmartJack Beam

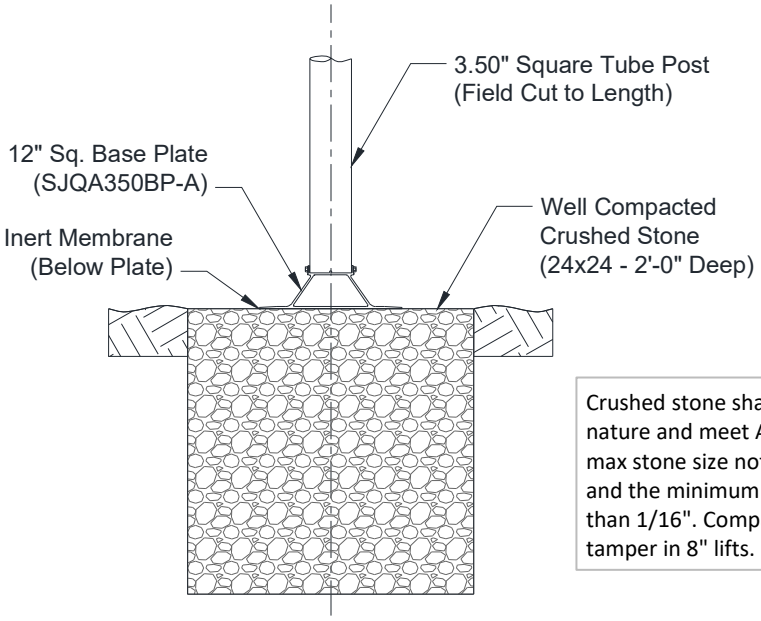
FDN Engineering, PLLC
2412 N 179th St.
Omaha, NE 68116
(402) 739-9642

NORTH CAROLINA PROFESSIONAL SEAL 044330 ENGINEER CHAD KELLER

Chad Keller 05/16/2025

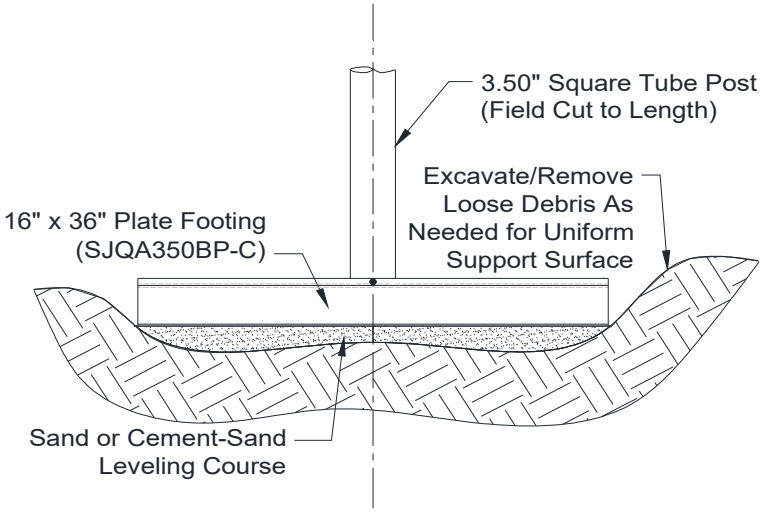
Firm License # P-2438

SmartJack Base Detail: Shown here is the SmartJack bottom half and footing. Multiple base conditions have adequate capacity to support the load. All below variations shown are structurally acceptable and may be used at the contractor's discretion based on site access conditions.



Crushed stone shall be angular in nature and meet ASTM C33, with max stone size not to exceed 1/2" and the minimum size no smaller than 1/16". Compact w/ hand tamper in 8" lifts.

Base Plate Over Crushed Stone



Steel Plate Footing

FDN Engineering, PLLC
2412 N 179th St.
Omaha, NE 68116
(402) 739-9642

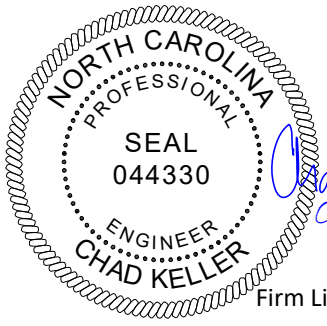
NORTH CAROLINA PROFESSIONAL SEAL 044330 ENGINEER CHAD KELLER

Chad Keller 05/16/2025

Firm License # P-2438

Wood Framing Project Notes (contractor to inform engineer if assumptions are inaccurate):

1. All structural lumber & framing to be #2 Spruce-Pine-Fir (SPF) or approved equivalent.
2. New wood-frame girders/joists that replace existing girders/joists to be at least as large as the original member, from like material, and supports placed no further than original distance.
3. Follow all requirements of applicable residential design code for all wood framing, including but not limited to, allowable span lengths, joist spacing, connections, bracing bridging, and nailing.
4. Per R317 of the current residential code, contractor to use preservative-treated wood if wood joists are closer than 18 inches to exposed ground.
5. Framing connections noted on the drawings are Simpson Strong-Tie (or equal). Install with the catalog designated connector in each hole.
6. All nails to be common wire (unless noted otherwise). All nailing into pressure treated wood shall be done with hot-dipped galvanized or stainless-steel nails.
7. Where sistering floor joists, sister with a like size/type wood member. Fasten sister joist to existing with (2) 10d x 3-in nails in each row. #12 structural screws x 3-in may be used instead of nails. End two rows spaced 6” apart & 16” o.c. in between. Sister joist to bear on support at each end (same support location and type as existing joist).
8. Where the subfloor is replaced, use 3/4" thick plywood sheathing. Nail and glue to supporting joists with 10d common wire nails at 6" o.c. around edges and 12" o.c. throughout (use commercial grade adhesive for gluing to each joist). Subfloor panels shall be oriented with the face grain perpendicular to the joist supports and have panel joints staggered.



05/16/2025

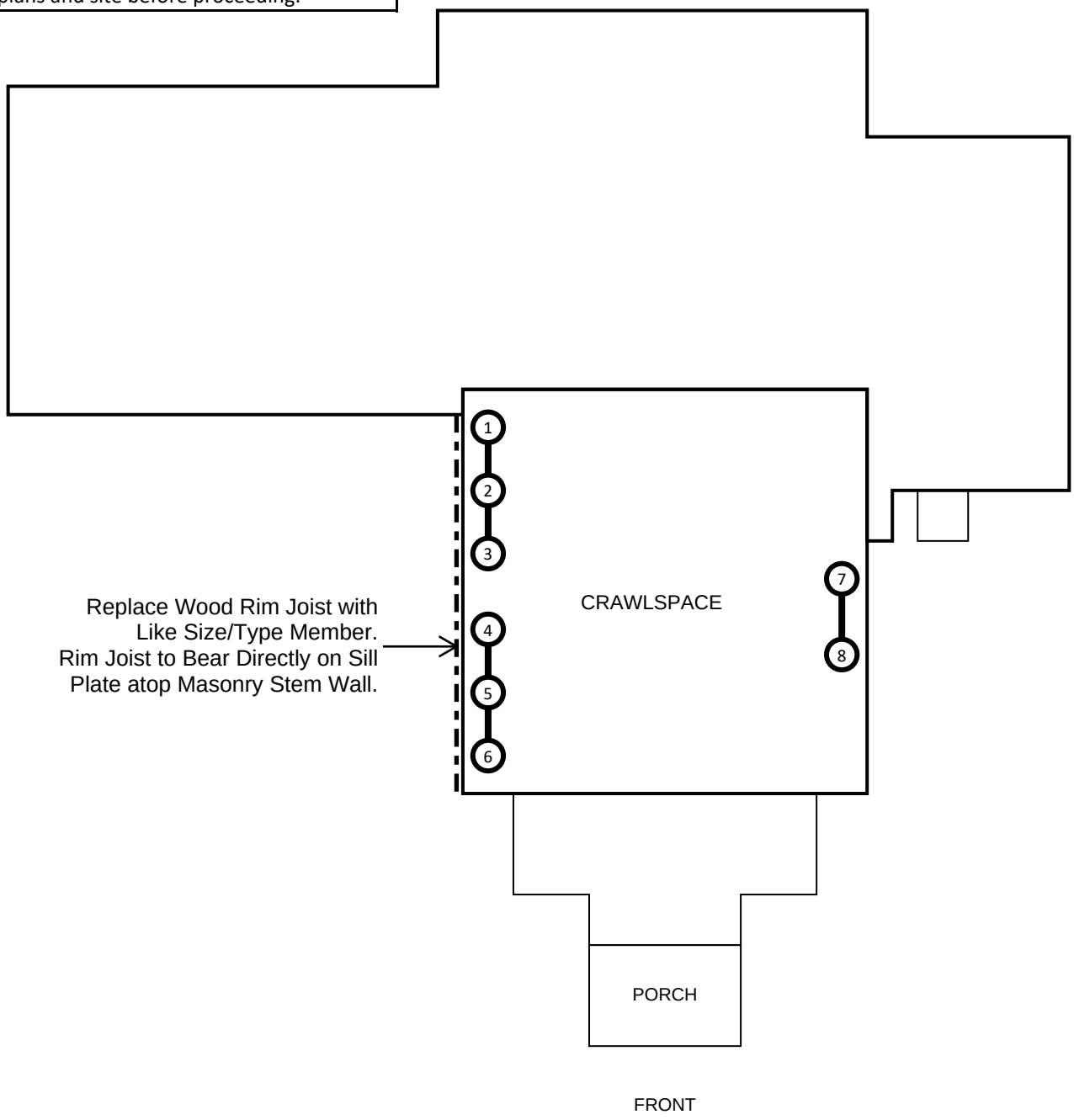
FDN Engineering, PLLC
2412 N 179th St.
Omaha, NE 68116
(402) 739-9642
Firm License # P-2438

SmartJack Notes:

1. Commercial construction, one-story.
2. Layout of (8) SmartJacks Model SJ350 w/ 6'-0" between supports (typ), 8'-0" (max).
3. Install per SmartJack manufacturer's instructions and technical specifications.
4. Notify engineer of discrepancies between plans and site before proceeding.

LEGEND:

- (#) Indicates SmartJack and Mark Number
- ━━━ Supplemental Beam
- — - — - Replace Rim Joist



REPAIR PLAN

DRAWING NOT TO SCALE

Project:		
Gunn Property (Church) 2685 Wire Rd Erwin, NC 28339	**FDN Engineering, PLLC** 2412 N 179th St. Omaha, NE 68116 (402) 739-9642	NORTH CAROLINA PROFESSIONAL SEAL 044330 ENGINEER CHAD KELLER 05/16/2025 Firm License # P-2438