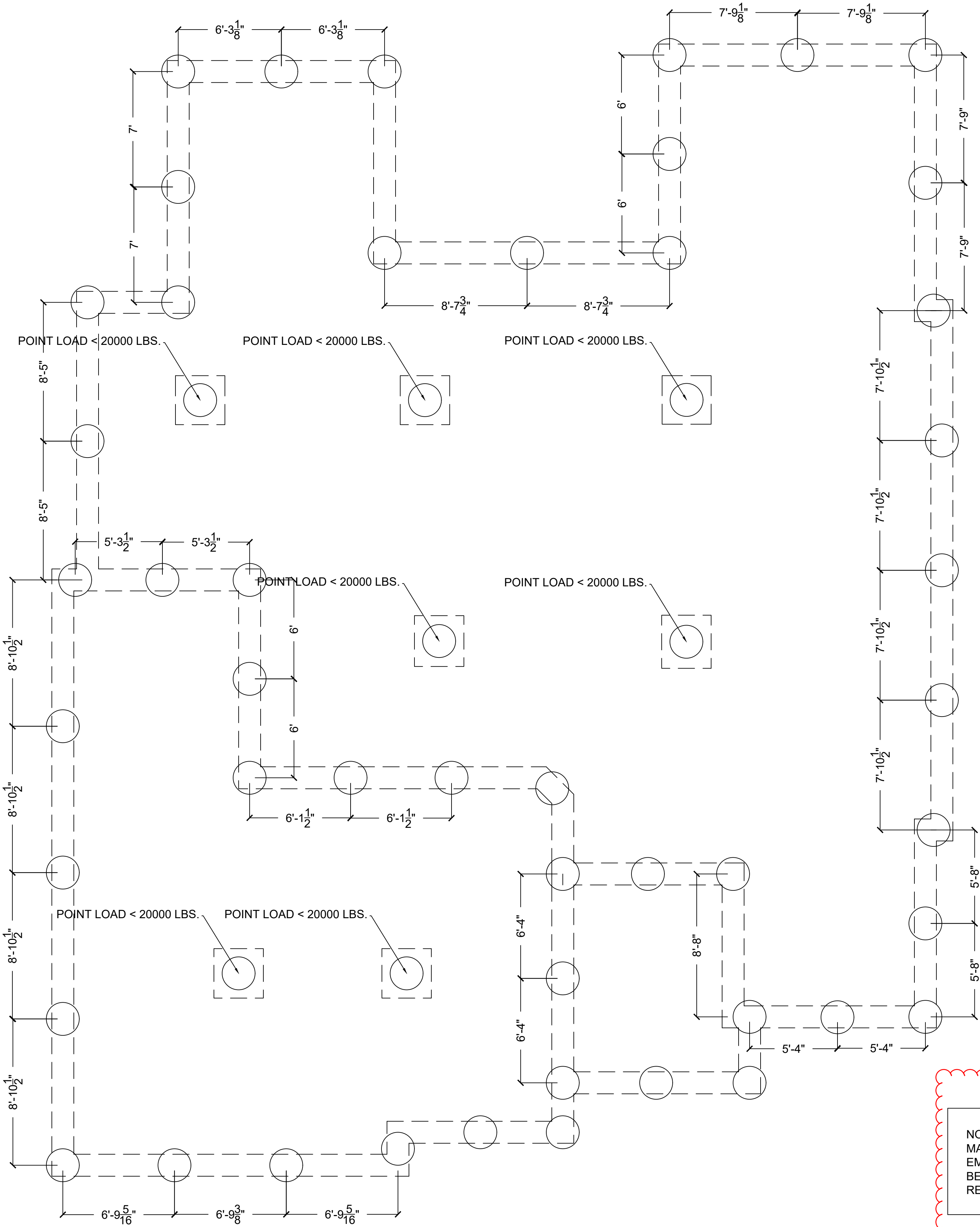




PILE CAPACITY (Q_{allow}) CALCULATIONS (USING PRESUMPTIVE LOAD BEARING VALUES IN LIEU OF SOIL TEST DATA)
FROM IRC 2018 TABLE R403.1(1), FOOTING CAPACITY MUST BE A MINIMUM OF 2333 PLF (14" WIDE X 2000 PSF).
ASSUMPTIONS:
SOIL TYPE - GC (CLAYEY GRAVEL)
FROM IBC 2018 TABLE 1802.2, BEARING PRESSURE CAPACITY AT THE SURFACE IS 2000 PSF
WEIGHT OF SOIL 100 PCF
LATERAL BEARING PRESSURE 150 PSF/FT BELOW THE SURFACE
COEFFICIENT OF FRICTION (TO CALCULATE PILE SKIN FRICTION RESISTANCE) .25
SKIN FRICTION RESISTANCE FACTOR OF SAFETY (FOS) 2.0
DESIGN PILE SHALL BE 24" (2.0') IN DIAMETER X 20' DEPTH (OR TO ROCK PRIOR TO 20')

CALCULATE END BEARING
END BEARING CAPACITY = PILE CROSS SECTIONAL AREA X SOIL BEARING CAPACITY AT DEPTH OF PILE TIP
END BEARING CAPACITY = $(\pi(2/2)^2)(2000 + 20(100)) = 12566$ LBS

SKIN FRICTION BEARING CAPACITY
THE AVERAGE SKIN FRICTION CAPACITY = $\frac{1}{2}$ THE DEPTH X LATERAL BEARING PRESSURE AT THAT DEPTH X THE SURFACE AREA OF THE PILE X
FRICTION COEFFICIENT ALL DIVIDED BY THE SKIN FRICTION FOS (WITH A MAXIMUM OF 15 TIMES THE LATERAL PRESSURE VALUE, SEE ABOVE,
THEREFORE USE A DEPTH OF $\frac{15}{2}$ OR 7.5')
SKIN FRICTION BEARING CAPACITY = $(7.5(150) \times \pi(2)(20) \times .25)/2 = 17671$ LBS

Q_{allow} = END BEARING + SKIN FRICTION - WEIGHT OF THE PILE
WEIGHT OF PILE = $\pi(2/2)^2 \times 20 \times 150$ (PCF) = 9425 LBS
 Q_{allow} = 12566 + 17671 - 9425 = 20812 LBS

MAXIMUM PILE SPACING = PILE CAPACITY / CODE SPECIFIED FOOTING CAPACITY (PLF) EXCEPT WHERE POINT LOADS FROM BEAMS AND
HEADERS ARE IDENTIFIED.

MAXIMUM PILE SPACING = 20812 / 2333 = 8.92' (8'-11")

PILE CONCRETE SHALL BE A MINIMUM 3000 PSI DESIGN MIX
REQUIRED AXIAL CAPACITY IS $P_u = Q_{allow} = 20812$ LBS.
PER IBC 2018 1810.3.2.6, THE AXIAL CONCRETE COMPRESSIVE STRENGTH $P_n = .3(f_c)(A_g) = .3(3000)(452 \text{ IN}^2) = 406800$ LBS. $\gg P_u$
BY IBC 2018 1810.3.9.2, NO AXIAL REINFORCEMENT IS REQUIRED SINCE NO BENDING MOMENT IS ASSUMED.

2018 International Building Code (IBC)				
CHAPTER 18 SOILS AND FOUNDATIONS				
TABLE 1806.2 PRESUMPTIVE LOAD-BEARING VALUES				
CLASS OF MATERIALS	VERTICAL FOUNDATION PRESSURE (psf)	LATERAL BEARING PRESSURE (psf/ft below natural grade)	LATERAL SLIDING RESISTANCE Coefficient of friction	Cohesion (psf) ^b
1. Crystalline bedrock	12,000	1,200	0.70	—
2. Sedimentary and foliated rock	4,000	400	0.35	—
3. Sandy gravel and gravel (GW and GP)	3,000	200	0.35	—
4. Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)	2,000	150	0.25	—
5. Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH and CH)	1,500	100	—	130

For SI: 1 pound per square foot = 0.0479kPa, 1 pound per square foot per foot = 0.157 kPa/m.

a. Coefficient to be multiplied by the dead load.
b. Cohesion value to be multiplied by the contact area, as limited by Section 1806.3.2 .

2018 International Building Code (IBC)	
CHAPTER 18 SOILS AND FOUNDATIONS	
1806.3.3 Increase for depth.	
The lateral bearing pressures specified in Table 1806.2 shall be permitted to be increased by the tabular value for each additional foot (305 mm) of depth to a value that is not greater than 15 times the tabular value.	
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AS-BUILT REPORT:

PER COMMUNICATIONS WITH THE PIER DRILLING CONTRACTOR ON 5/6/2025, ALL PIER BORINGS ENCOUNTERED A SOLID BEDROCK SHELF AT A MAXIMUM DEPTH OF 14'. USING THE TABULATED VERTICAL BEARING CAPACITY FOR BEDROCK, THE 18" DIAMETER PIERS ARE SUFFICIENT FOR THE REQUIRED FOOTING CAPACITY.

DAVID MEZGER P.E.
5/8/2025

AS-BUILT
REVISION

RELEASE FOR CONSTRUCTION
AS NOTED ON PLANS REVIEW
DEVELOPMENT SERVICES
LEE'S SUMMIT, MISSOURI
05/08/2025 2:15:02

NOTE: ALL PIERS ~~24"~~ 18" DIAMETER X 20' DEEP
MAXIMUM OR TO ROCK U.N.O.
EMBED (2) #4 BARS 5' INTO TOP OF PIER AND
BEND OVER 24" TO LAP ONTO FOOTING
REINFORCEMENT.

NOTE: THIS DRAWING TO BE WORKED WITH PLAN
#4415LA SHEET 2 OF 5 OF THE ARCHITECTURAL
SET.
USE SHEET 2 FOR REFERENCE TO PLACE PIERS.
DIMENSIONS SHOWN ARE FOR VERIFICATION OF
TRIBUTARY SPAN ONLY.

DAVID MEZGER ENGINEERING LLC

212 NE Circle Drive Kansas City, MO 64116
mezgerde@gmail.com
913-481-3774

Engineers seal is for
STRUCTURAL design and
review only.

0	PERMIT ISSUE	4/17/25
NO.	REVISION / ISSUE	DATE

BUILDER / ARCHITECT

TRUMARK HOMES

PROJECT NAME / ADDRESS

LAURA
LOT 152 WOODSIDE
2090 NW O'BRIAN RD
LEE SUMMIT MO

PROJECT #: 25041

DATE: 4/17/2025

SCALE: 1/4" = 1'-0"

SHEET:
S-0.1