

Rogers IT Department
March 10, 2026

Structural Schematic Design Narrative

GENERAL

This project involves the construction of a single-story, standalone, IT server building for the City of Rogers. The building is located at 301 West Chestnut Street, Rogers, Arkansas. The building includes a server room, offices, restrooms, break room, conference room, janitor closet, storage, and a covered entry as well as required generators and mechanical equipment. The building is approximately 4,700 square feet and will be designed as an ICC-500 storm shelter. The roof height is 14'-0" above the ground finished floor, and the walls extend 2'-4" above that to form a parapet condition. Reference the attached floor plans for general slab on grade and roof layout to accompany this structural narrative.

FOUNDATIONS

A foundation system will be designed to adequately support the building superstructure. A geotechnical report for this specific site has been prepared by Olsson, dated February 4, 2026.

The recommended foundation system is shallow continuous footings below load bearing walls.

Assume 6'-0" wide by 2'-0" shallow continuous footings below exterior precast walls supporting both gravity and lateral loads. Assume 50 pounds per linear foot of reinforcing in the continuous footings.

The slab-on-grade will be 4-inches thick reinforced with #4 @ 10" O.C. rebar in a single layer in each direction. The slab on grade is assumed to be polished and exposed in final condition. Assume 5'-0" long #4 epoxy coated dowels at door thresholds to interface with civil/site slab at exterior. A 2'-0" wide by 8" deep slab on grade turndown is required below interior CMU walls, reinforced with (4) #4 bars running continuous below the CMU wall.

The following foundation parameters are provided in the geotechnical report prepared by Olsson:

- Net Allowable Soil Bearing Pressure (Continuous Footings) = 2,000 plf (pounds per linear foot)
- Estimated differential settlement over 40'-0" = 0.5 inches
- Ultimate Coefficient of Friction = 0.3

Per the geotechnical report, existing soils are required to be excavated to a depth of 1'-0" minimum and recompacted or replaced with structural fill below the slab on grade. This excavation must extend 5'-0" beyond the building perimeter per the geotechnical report.



SUPERSTRUCTURE

The superstructure is anticipated to be structured out of precast concrete. The walls will be precast sandwich panels with brick façade supporting precast double tees for the roof.

For the double-tee roof, assume 8DT32, 148-S strand pattern with a 3-inch normal-weight concrete topping slab reinforced with 4 pounds per square foot of rebar.

The exterior walls are anticipated to be 12-inch-thick precast sandwich wall panel with a 6-inch interior precast layer, 2-inch insulation layer, and a 4-inch exterior precast layer. Precast haunches or corbels built integrally with the precast wall assembly are assumed to support the north and south ends of the precast double tees.

Interior CMU walls for this project will act as non-load bearing partitions. Assume #4 bars spaced every 32" from slab on grade to top of wall. Only cells with reinforcing are required to be grouted. Assume a double course continuous bond beam at the top of the wall reinforced with (2)-#4 longitudinal bars. Assume ladder type horizontal reinforcing with W1.7 wires at 16" on center in head joints running the length of the wall.

All windows, doors, and louvers will be ICC-500 rated.

There is a steel canopy over the north and south entrance doors. Assume 10 pounds per square foot steel over the canopy areas. This canopy will be designed to break away during an extreme wind event.

DESIGN CRITERIA

The governing building code is the Arkansas Fire Prevention Code 2021 Edition, which references the 2021 International Building Code (IBC) and the ICC-500 Standard for the Design and Construction of Storm Shelters.

A. This building is classified as Risk Category IV

B. Design Dead Loads will include:

1. Structure self-weight of roof and wall panels
2. Allowance for hung C/L/M/E/P (ceiling, lighting, mechanical piping and ducts, sprinklers, electrical, and plumbing) = 10 psf
3. Roofing and insulation = 5 psf

C. Wind loading for Storm Shelter in accordance with ICC-500 and ASCE 7-16 using the following parameters:

1. Basic Ultimate Wind Speed = 250 mph
2. Basic Nominal Wind Speed = 194 mph
3. Exposure Category C
4. $K_d = 1$
5. $G C_{pi} = +/- 0.18$ [assuming atmospheric pressure change (APC) venting of 1 square foot per 1,000 cubic feet of interior shelter volume is provided] or $+/- 0.55$ (if APC venting is not provided)



D. Impact Loading per ICC-500:

1. Speeds for 15-lb. sawn lumber 2x4 missile for tornado shelters
 - a) 100 mph for vertical surfaces
 - b) 67 mph for horizontal surfaces

E. Roof loading in accordance with ICC-500 using the following parameters:

1. Roof live loading of 100 psf

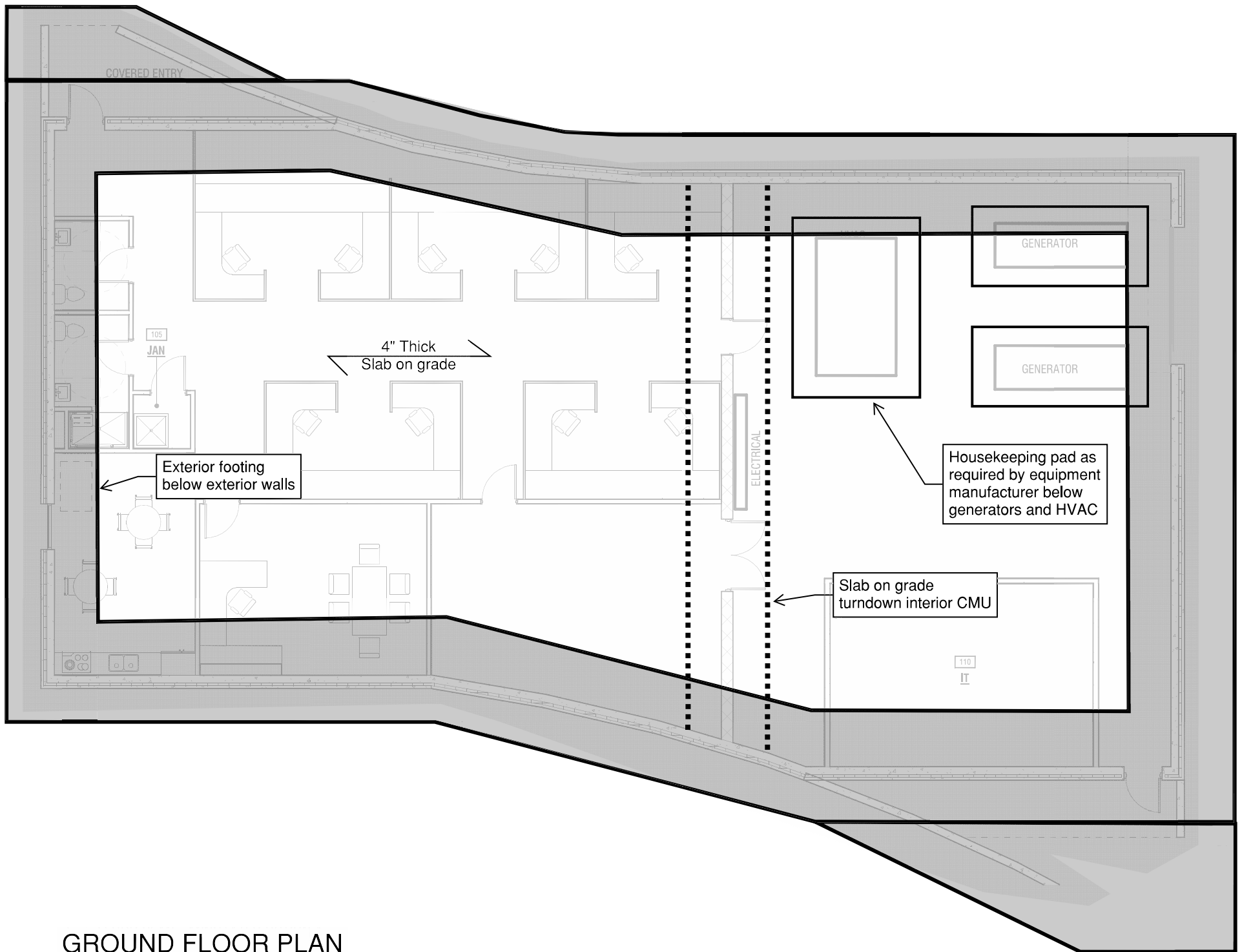
F. Seismic loading in accordance with IBC 2021 and ASCE 7-16 using the following parameters:

1. Soil Site Class = D
2. Short Period Spectral Acceleration (S_s) = 15.8% g
3. One-Second Period Spectral Acceleration (S_1) = 9.1% g
4. Seismic Design Category = D
5. Seismic Importance Factor for Risk Category II = 1.5

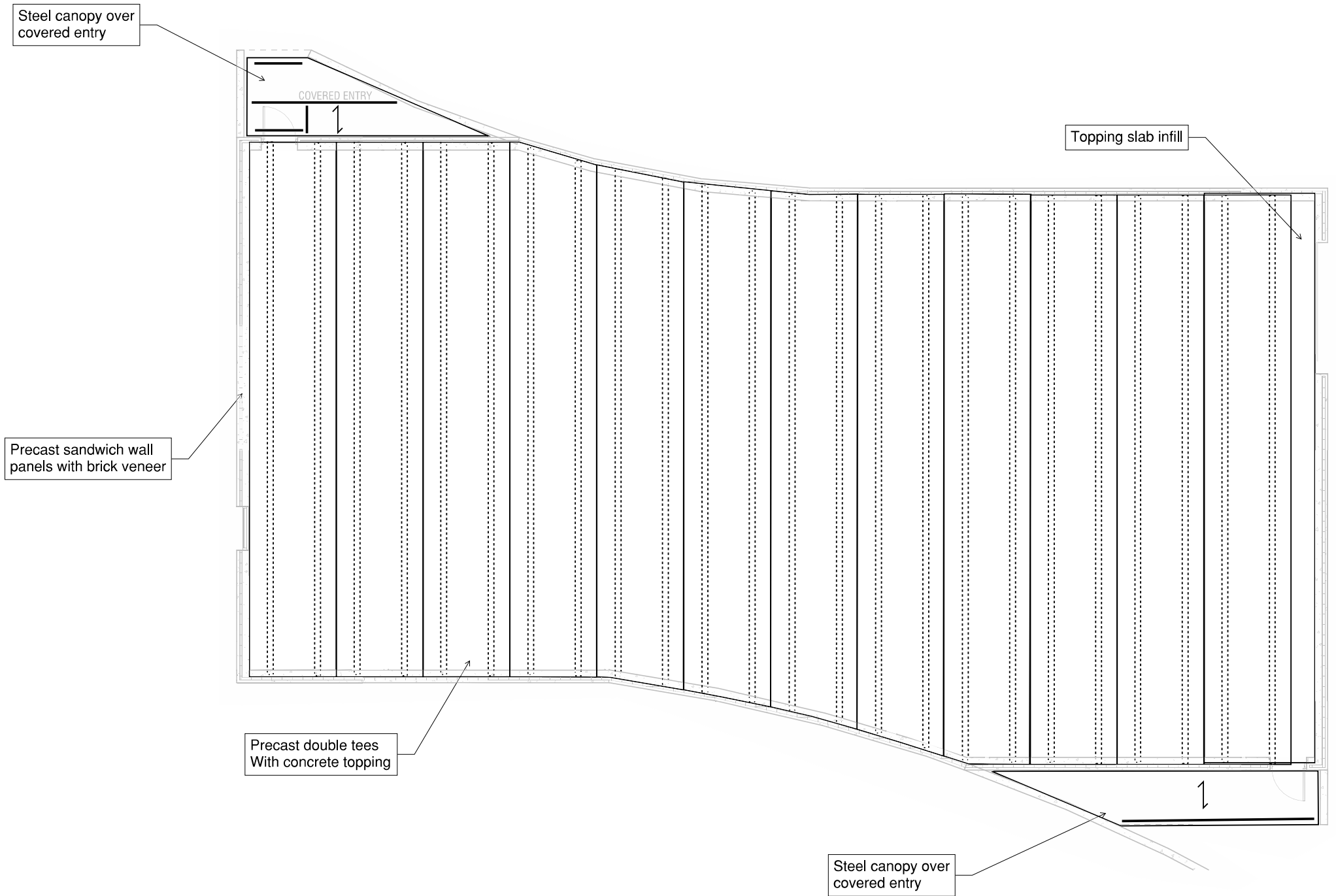
G. Frost depth = Not provided in geotechnical report, but is assumed to be 24"

H. Snow Loading:

1. Ground Snow Load = 15 psf
2. Snow Exposure Factor, C_e = 1.0
3. Thermal Factor, C_t = 1.0
4. Rain on Snow Load = 5 psf
5. Uniform Roof Snow Load = 17 psf
6. Flat Roof Snow Load = 11.6 psf
7. Snow Load Importance Factor for Risk Category III = 1.2



GROUND FLOOR PLAN



ROOF PLAN