



STRUCTURAL ENGINEERING

To: Kurt Frey/Ryan Schultz

From: Luis

Subject: Foundations plan

Date: July 2, 2019

Dear Kurt.

1 Loads

1.1 Loads on balconies

At present, we consider a live load of 40.0 psf (same as occupancy served according to IBC 2015) plus a snow load of 42.0 psf. Nevertheless, it seems logical to consider some snow accumulation on balconies. That way, we can take a snow load on balconies as follows:

$$1.6 \times 75 = 120 \quad (1)$$

$$1.6 \cdot S + 0.5 \times 40 = 120 \implies S = 62.5 \text{ psf} \quad (2)$$

1.2 Storage/HVAC

We have not distinguished this area from the rest of the surrounding corridors and stairs (100 psf). We will need to update this on the loading plan.

1.3 Loads on the community courtyard (plaza areas)

1.3.1 Regular loads

We forgot to write out the loads over this area in the structural notes drawing. In the loading plan we have defined them as follows:

Dead load (gypcrete+composite sleepers)	110.0 psf
Live load (yards, pedestrians)	100.0 psf
Snow load	42.0 psf

If the live load you propose includes the snow load (like in the balconies) we have the following:

$$1.6 \times 150 = 240 \quad (3)$$

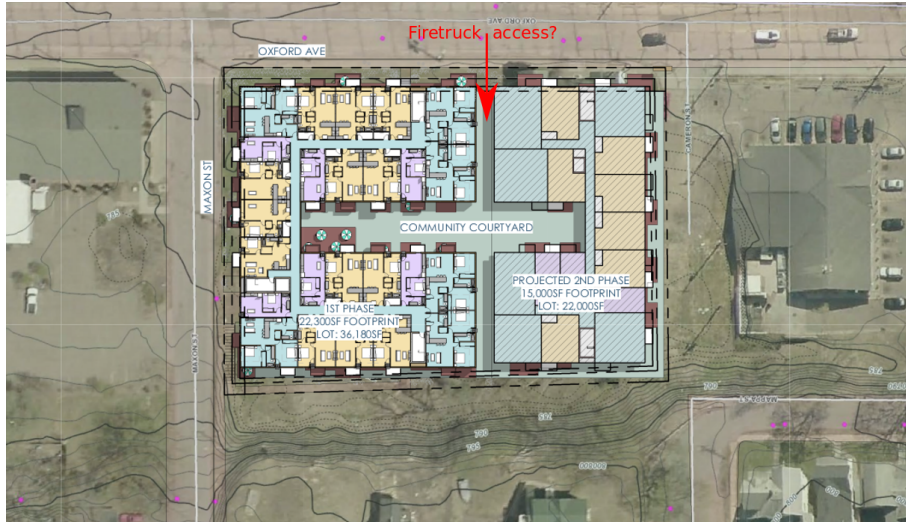


Figure 1: Roads around the building.

$$1.6 \cdot S + 0.5 \times 100 = 240 \implies S = 118.75 \text{ psf} \quad (4)$$

That seems a lot of snow, maybe we must increase the live load?

1.3.2 Fire truck access to the courtyard (plaza)

We have not taken into account any fire truck load. @Ryan: it's planned the access of fire trucks to the courtyard? In that case we will need to fix the loads according to sections 1607.7.1 and 1607.7.2 and update the loads plan sent to County materials. We will need to recalculate the footings also.

2 Deflection limits

Our mistake, we consider $L/480$ as the deflection limit for the wood trusses.

2.1 Earth pressure at rest

That's a typo. The correct value is 62.5.

3 Structural members

3.1 Wall footings

I'll check again for the width of the footings and remove the bottom reinforcement when possible (it's very rare to design plain concrete footings around here).

3.2 Concrete slab

3.2.1 Slab thickness

We have taken the simplest solution of those in ACI-360R, if the 4 inches (10.2 cm) slab presents advantages with regard to cost or ease of construction we can change it.

3.2.2 Floor drainage

At present, we don't have plumbing drawings with drain location. We will add a note in the foundation plans referring to those drawings. Once the position of the floor drains is fixed, we'll update the slab geometry.

3.3 Details

3.3.1 Wall reinforcement

We'll add a reinforcement schedule for the walls.

3.3.2 Wall footings

We'll adapt the reinforcement detail to the reinforcement schedule to avoid confusion.