Project Name: Cascade Mixed Use
Jurisdiction: City of Arlington
Permit #: PLN 888

QUESTIONS FROM CITY CLARIFYING THE BASEMENT DESIGN

1. **How is the water from the footing drains going to be addressed? Will they be pumped, or some other means? Where will that water be discharged to?**

- *If footing/slab drains are omitted, foundation and slab-on-grade occurring below the water table can be designed to resist uplift forced caused by the volume of water they displace.*
- *If basement wall drainage is omitted, basement walls can be designed for hydrostatic pressure.*
- *The soil report provides material requirements under footings and slab-on-grade without the presence of ground water and addresses the foundation design with the presence of water.*

2. **Are there CB's in the garage, and how will that system work? Treatment, detention, outlet?**

- *It is expected that there will be drainage systems in the garage. These would be mechanical systems that would be collected, routed through an oil/water separator, and pumped up to gravity drain to the sewer system. Internal water is not allowed to discharge to surface or groundwater per the Manual.*

3. **How are the floor foundations sealed to prevent water infiltration?**

- *The floor slab and wall in the basement will be waterproofed as would any penetrations of the slab or foundations walls sealed to prevent water from penetrating the building.*

4. **This sketch shows a footing and a slab, but what is that slab resting on? What kind of foundation material will that be, and how will water move through or around it?**
   (See answer to Q6 below)
5. **How many interior column footings will there be?**

- *The slab will rest on gravel material as detailed between the structural engineer and soils engineer. It is not expected that the gravel would impede groundwater flow. See below for further discussion by the hydrogeologist.*
- *There will be approximately (45) columns.*

6. **As groundwater follows its natural flow through this location, what happens when it encounters the building foundation, and how will that affect the surrounding areas? Isn't the building essentially a big dam that will divert the natural flow of groundwater? The mounding analysis didn't seem to take the building into consideration.**

Response: The aquifer underlying the site is up to several hundred feet in thickness and extends across the valley. If during the wetter months of the year groundwater levels rise and a portion of the building is below the water table there will not be effects on the regional groundwater flow, as well as localized flow in the area of the building. The groundwater will continue to flow around the building as a stream would flow around a boulder in the stream bed. Expect in this case the building is not a "boulder" extending all the way to the bottom of the aquifer it is simply penetrating the upper several feet of the aquifer. Also remember unlike the boulder in the stream analogy groundwater flow velocity is orders of magnitude less than stream flow velocities.

- *If we installed monitoring well upgradient of the proposed building and downgradient of the proposed building and measured the depth to water in each well, and then placed the building into the water table, we would see no change in the water levels in the two wells. There would be no effect to surrounding areas or the natural regional flow of groundwater.*

7. **How will the downspouts be connected to the system?**

- *Roof drain leads will be internal to the building and will discharge to the east side. From there, they will be connected to the infiltration system with solid wall PVC pipe.*

8. **In the sketch it shows the infiltration trench to drain at a 45 degree angle out from the trench, however water follows the path of least resistance. If the footing foundation material is an easier path, won't the runoff end up there instead?**

- *There will be no footing drain to intercept groundwater. The slab and supporting walls will be waterproofed and designed for appropriate hydraulic pressure.*