187882

Agenda Item 774 -775

TESTIMONY 10TH & YAMHILL SMARTPARK RENOVATION ~~4:00 TIME CERTAIN~~

~~GOOGLE FIBER~~

IF YOU WISH TO **SPEAK** TO CITY COUNCIL, **PRINT** YOUR **NAME, ADDRESS, AND EMAIL.**

NAME (PRINT)	ADDRESS AND ZIP CODE *(Optional)*	Email *(Optional)*
~~LINDSAY KAPLAN~~		
✓ DOUG Peterson	Petersons Stores 115 SW Yamhill POX	DGPETE@Teleport.com
✓ David Gwyther	929 SW Salmon #300 97205	DavidGGwyther@yahoo.com
✓ Shedrick Wilkins		

Date 06-29-16

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Seismic Retrofit Cost Estimate for Garage Building at 730 SW 10th Ave, Portland, Oregon

By:

Franz Rad, PhD, PE

June 22, 2016

Scope of Work

Briefly evaluate the garage building located at 730 SW 10th Ave, Portland, Oregon, and produce an estimate of seismic retrofit cost for the building. The scope of work and report are not to include structural analysis with computation, materials testing, or recommendations for specific seismic retrofit design and process. A brief report to be submitted to Mr. Doug Peterson.

Executive Summary

- The structure contains about 240,000 ft^2 area.
- Seismic retrofit cost estimate is in the range of about 22 to 36 dollars per ft^2, depending on the level of retrofit desired.
- Total cost of retrofit is estimated in the range of 5 to 9 million dollars.
- The range of cost estimation may be considered as "Life Safety" at the lower end to "Rapid Occupancy" at the upper end.
- Structural analysis to determine the potential level of seismic damage and to develop a plan for seismic retrofit is recommended.
- It is expected that other seismic retrofit estimates may vary from the stated values in this report.
- There is no implied judgment regarding the quality of the original structural design and construction in this report.

Evaluation Steps

The evaluation steps taken included the following:

- A brief review the structural documents available in the City of Portland, Bureau of Development Services.
- A brief site visit and conversation with Peterson's store manager.

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General Description of the Garage Building

The 730 SW 10th Garage Building (GB) is a 7-story building. City of Portland documents indicate construction of the foundation system taking place during 1977. In this building (GB), the first five floors include concrete beams and the top two floors include steel beams and a combination of steel and concrete columns, with composite steel-concrete floors.

The Garage Building (GB) structure is essentially similar to a Precast Concrete Frame (PCF). PCF construction has been widely used in the past several decades. PCFs are similar to post and beam systems where concrete columns, beams and/or slabs are prefabricated and assembled on site. This Garage Building (GB) may also be considered as mixed construction, in that the beams and/or columns are precast, but the floors and shear walls are cast-in-place concrete. Moreover, the top two floors the Garage Building (GB) include steel framing, composite floors and concrete shear walls.

The first five stories of Garage Building (GB), the vertical-load-carrying members are precast-prestressed beams of rectangular cross-sections. The beams are seated on brackets (corbels) that protrude from columns. As such, the beams are "simply supported" and their function is to carry gravity loads. They do not contribute to the lateral load carrying capacity of the building.

As for the quality, generally speaking, precast concrete elements are of higher quality as compared to cast-in-place concrete members.

Potential Earthquake Damages

The earthquake performance of this type of structural system, as in most other systems, depends on factors such as intensity of the quake, site geology, foundation system, the code of practice used in design, detailing used to connect the structural elements together to produce sufficient strength and ductility, and construction quality.

Structures of this type often employ cast-in-place concrete shear walls for lateral-load resistance, as it is in the case of the subject building. They can experience damage similar to other shear wall buildings, including excessive cracking in the shear walls and excessive cracking and weakening of columns. Generally speaking, potential damage areas in precast frames are due to poorly designed connections between prefabricated elements, or insufficient connection between floor elements and columns.

Recommendation for Further Study

The subject building was designed based on "older codes" (in this case the 1976 Uniform Building Code) that did not include modern provisions for the expected magnitude of the earthquake force and rules for seismic design of reinforced concrete buildings. As such, structures similar to the subject building are more prone to non-ductile types of failure when subjected to earthquakes.

The seismic force requirements of more recent codes are significantly larger than those prescribed in the 1976 UBC. Moreover, the quality and accuracy of structural analysis methodology today are significantly higher than those of the late 70s. For these reasons, it is recommended that further study be conducted to determine the potential level of seismic damage and to develop a plan for seismic retrofit to lead to a more accurate and realistic cost estimate.

Seismic Retrofit Techniques

If seismic retrofit is deemed required and feasible, a few retrofit techniques can be considered depending on which elements need to be strengthened, as summarized below.

Main Lateral Load Resisting Elements

In this Garage Building (GB), it evident that more reliance is placed on the shear walls to carry the seismic forces. The shear walls in this building were not designed based on the modern "seismic detailing" requirements of recent codes, hence will not have strength and ductility comparable to shear walls in a new structure.

If a future "Seismic Structural Analysis" for this building finds that the shear walls may be overstressed, then a structural retrofit technique such as the following may be considered.

- Add new shear walls to reduce the seismic shear forces in the existing shear walls and in the floor diaphragms.
- Add new boundary elements to existing shear walls to increase strength and ductility.
- Use CFRP overlay (wrap) to increase the shear capacity of the existing shear walls.

Columns

In this structure, more reliance is placed on the shear walls to carry the seismic forces. However, a portion of the seismic forces will be transferred to the columns. The columns in this building were not designed based on the modern "seismic detailing" requirements of the recent ACI codes, hence will not have ductility comparable to columns in a new structure.

If a future "Seismic Structural Analysis" for this building finds that the columns may be overstressed, then a structural retrofit technique such as CFRP wrap may be considered to increase the strength and ductility of the columns.

Beam to Column Seats (Corbels)

If a future "Seismic Structural Analysis" for this building finds that the corbels may be overstressed, a structural retrofit technique such as the following may be considered.

- Add epoxied shear dowels through the corbel to increase vertical shear and/or bending strength.
- Add structural steel bolster under the corbels.
- Add new steel column or reinforced concrete column.
- CFRP wrap.

Floors

If a future "Seismic Structural Analysis" for this building finds that the floors may be overstressed, a structural retrofit technique such as the following may be considered.

- Add reinforced concrete topping to increase shear capacity of floor diaphragms.

Photographs

Photographs of the various sections of the garage building are shown on the following pages (pages 5 through 11).

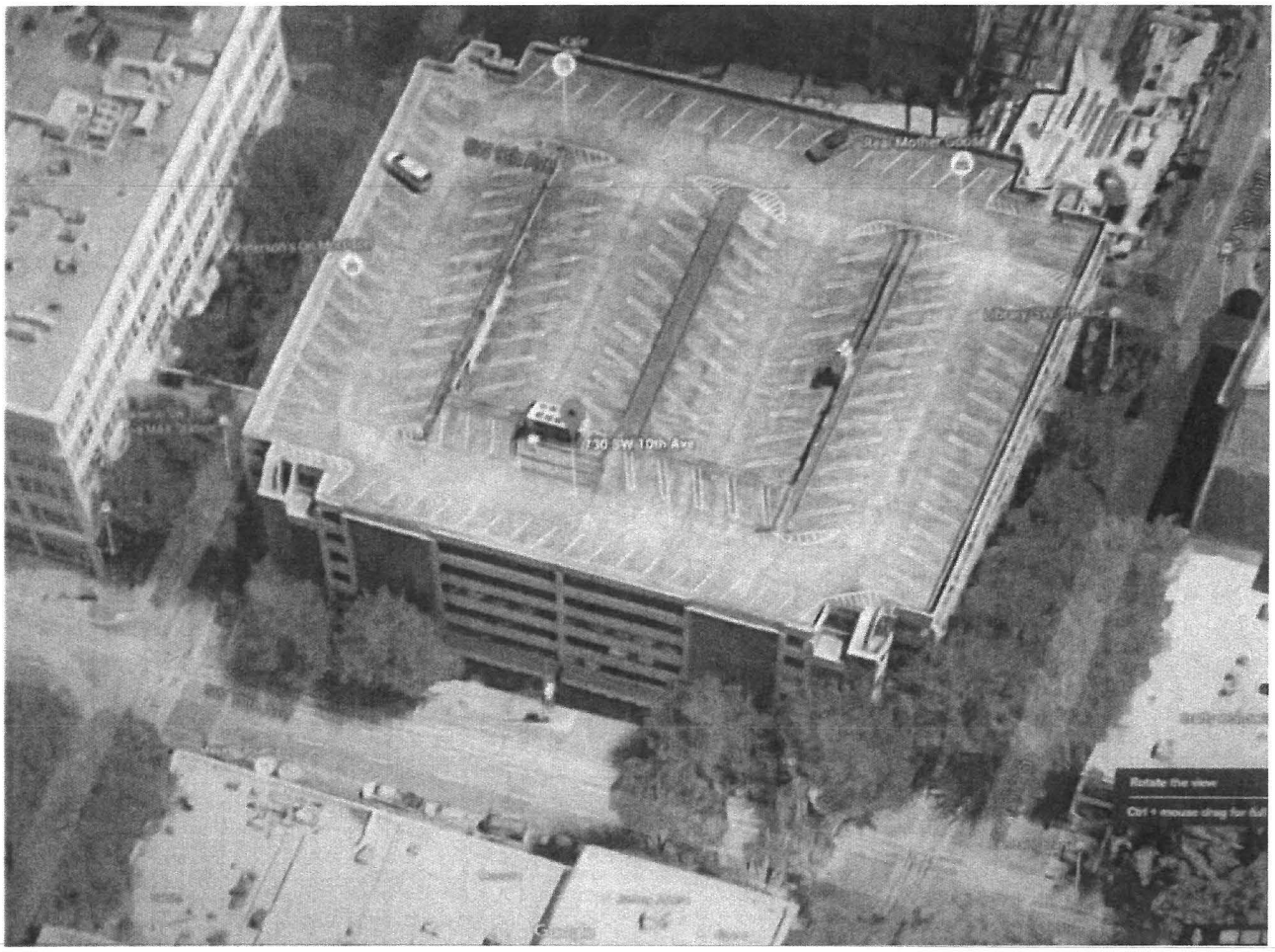

Figure 1, Overview of the Garage Building (Source: Google)

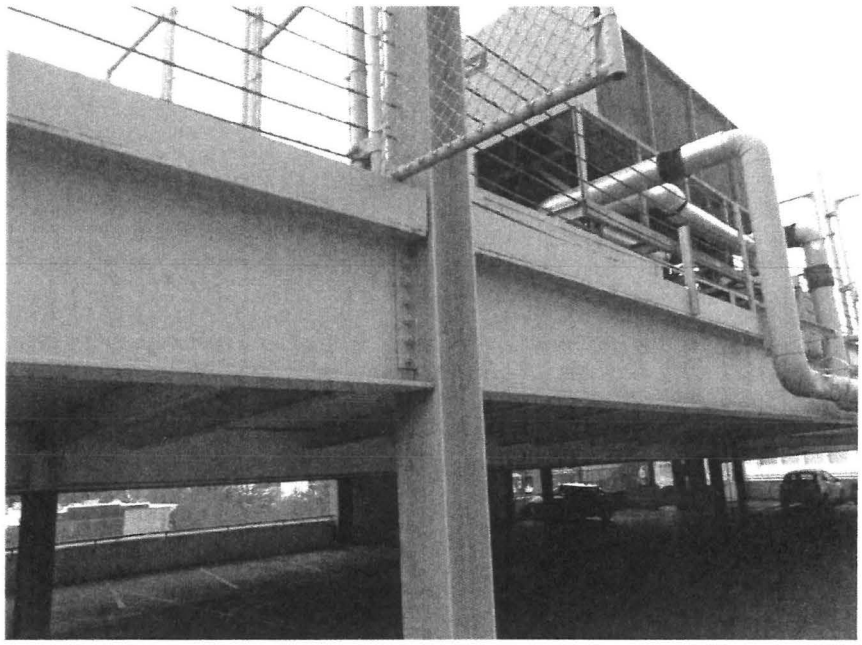

Figure 2, Steel framing in the upper floors

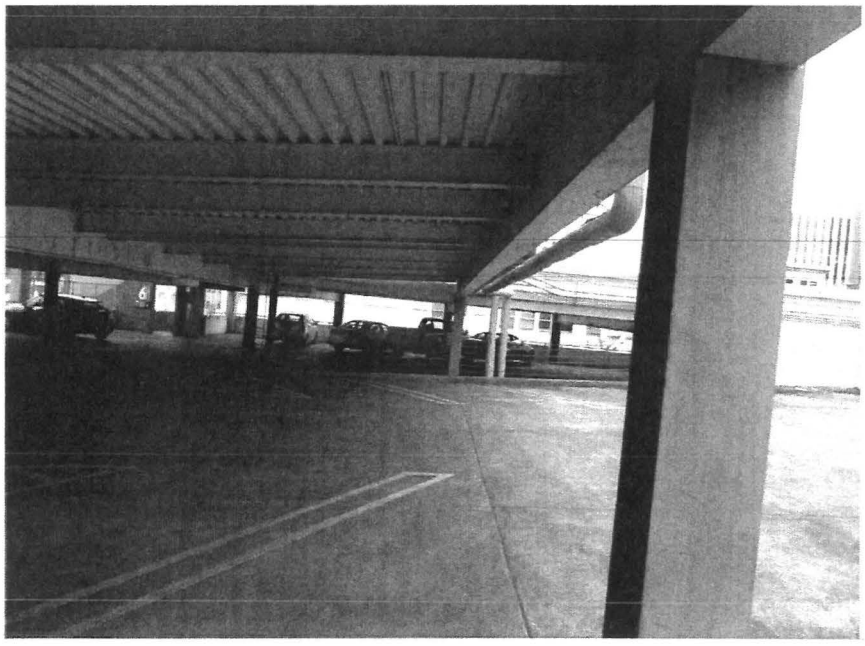

Figure 3, Compsite floor construction, upper floors

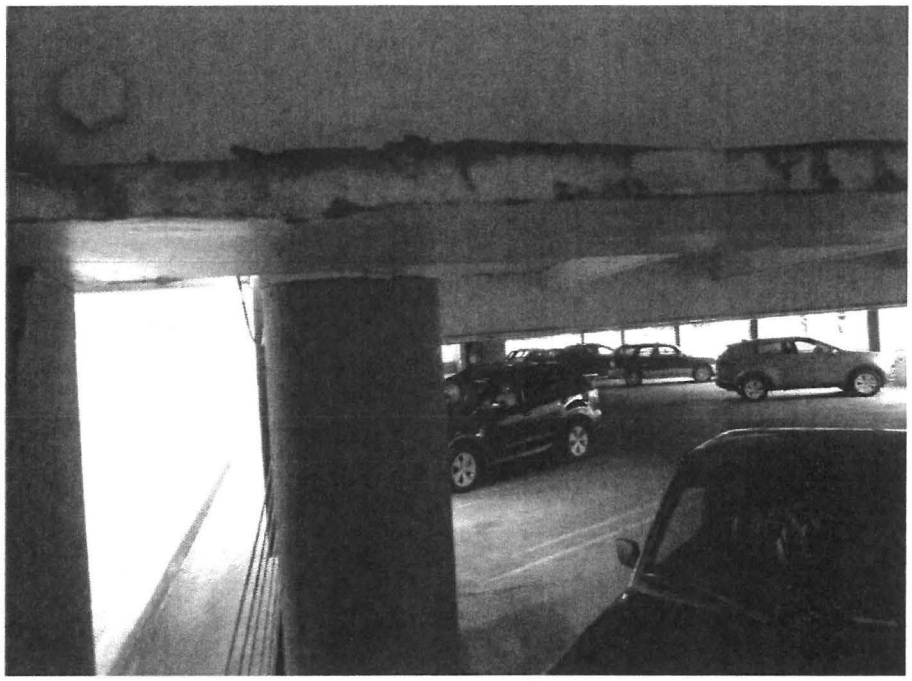

Figure 4, Evidence of rust in some steel sections

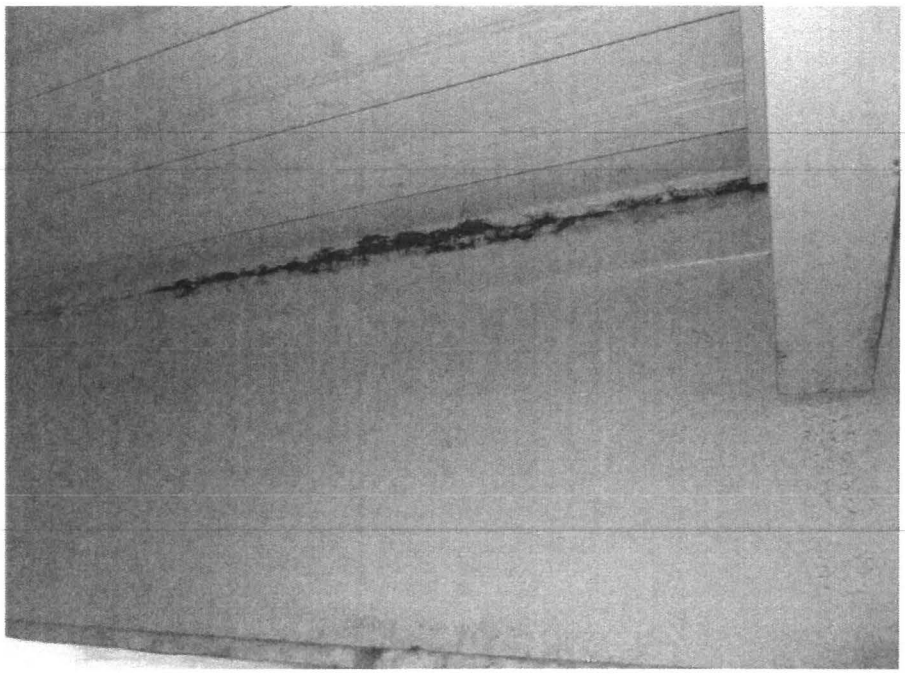

Figure 5, Evidence of rust in some steel sections

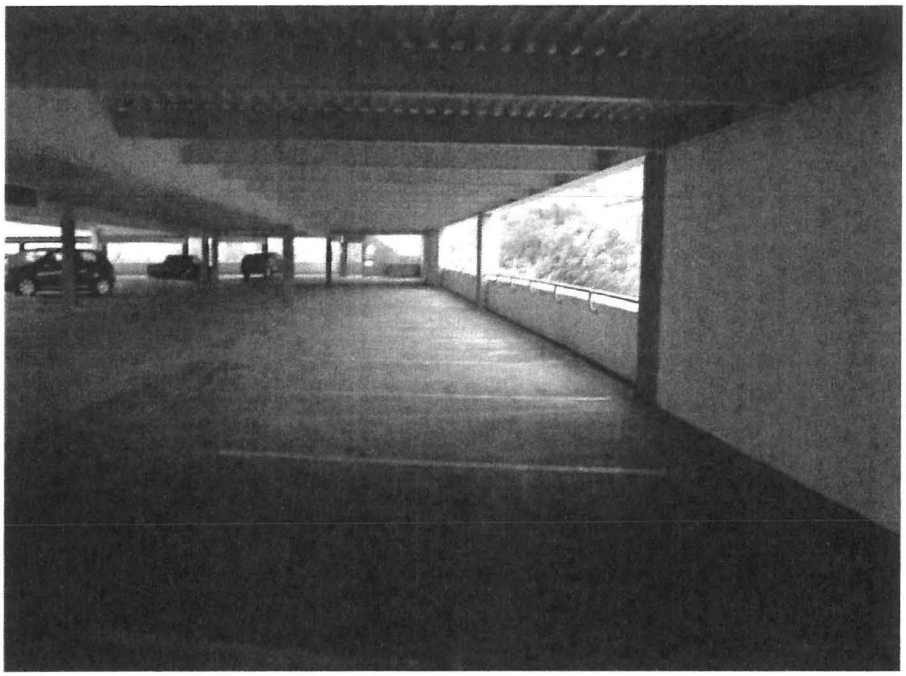

Figure 6, Shear walls in the N-S direction

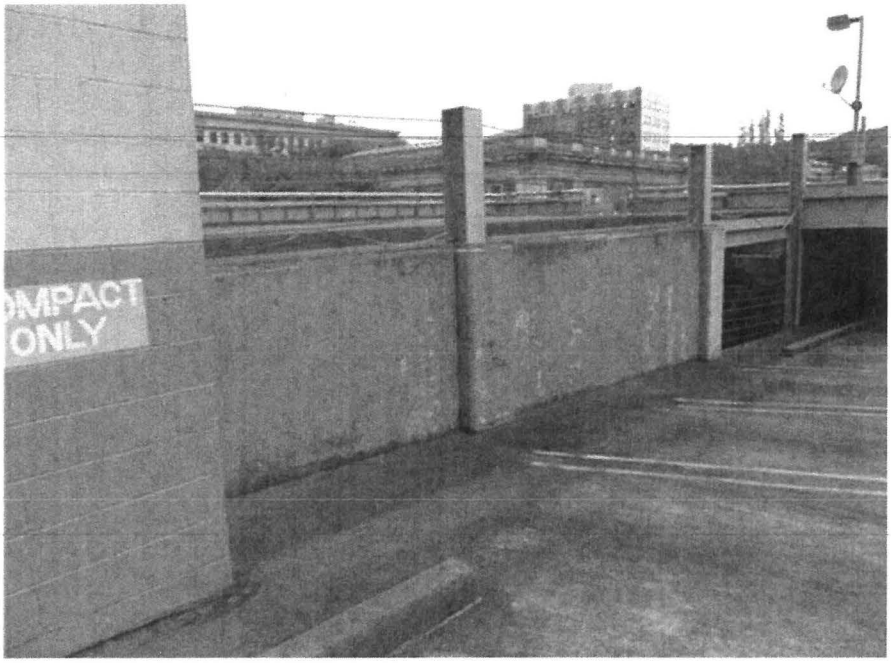

Figure 7, Shear walls in the E-W direction

Figure 8, Framing system in the 5th floor

Figure 9, Concrete framing system in the 4th floor

Figure 10, Concrete framing system in the 3rd floor

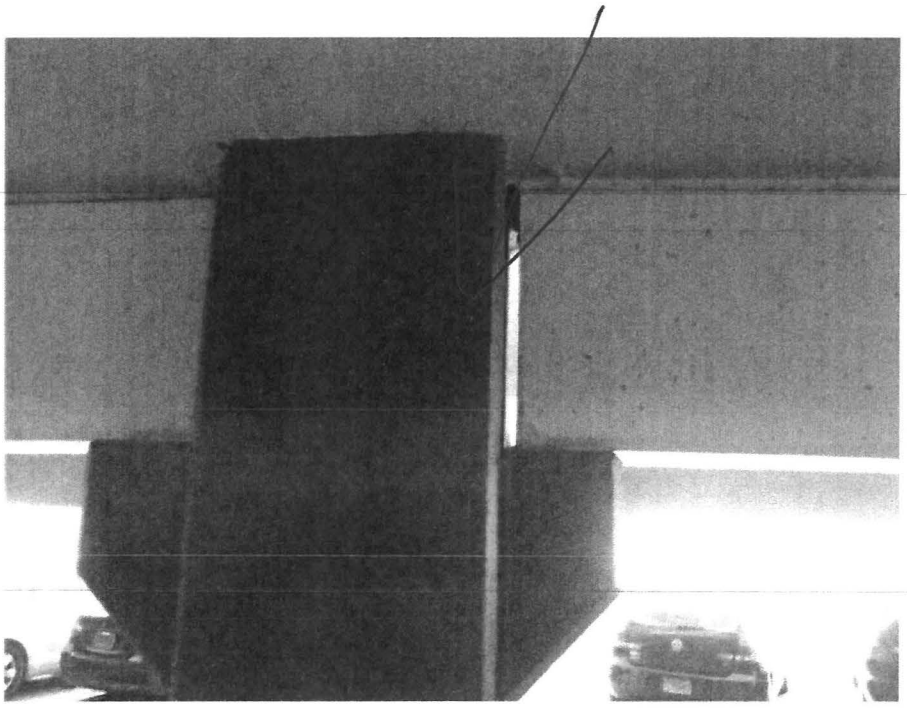

Figure 11, Beams on corbels

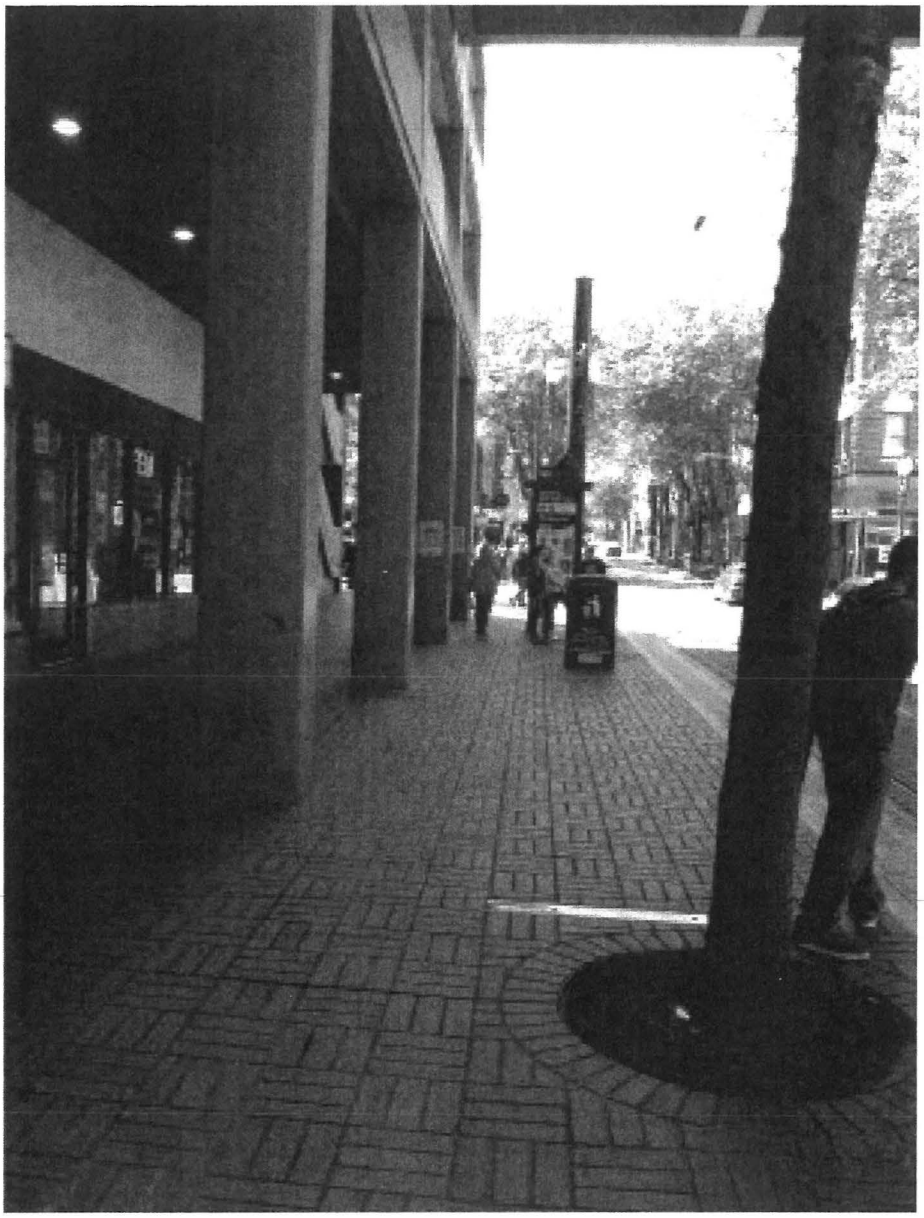

Figure 12, Longer Exterior Columns

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Peterson's is a successful locally owned small business with three convenience stores serving Downtown Portland employing 25 employees. Our flagship store is Peterson's on Morrison located in the city owned Tenth and Yamhill Parking Garage. The store's location is focused on the Max Blue and Red line transit stop which is very important to our operation. This was our first store and we've been there serving hundreds of customers everyday for over 31 years, established in 1984. Representatives from the Portland Development Commission have told all tenants that there will be an over 25 million dollar remodel of the entire building and that all tenants must vacate the building sometime in 2017 for this remodel and that it would take a year to complete and there would be no guarantee that existing tenants could return. While other tenants will move on to other locations and would not want to return after one year, ours is a very focused business serving the foot traffic generated by the Max line. We feel that as a successful business that customers love, that has served these customers for over 31 years should be able to return to this same location when the remodel is completed. Also, we feel that perhaps that the remodel could be done in stages so there could be a shorter time that the store would have to vacate. The Portland Development Commission web site talks of nurturing entrepreneurs and small business and business retention. We have never needed any government loans or assistance. All we ask is that we can return to our current space with a competitive market rate lease for five to ten years.

Douglas Peterson, office 115 SW Yamhill, Portland, OR 97204, 503-227-0567

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Peterson's on Morrison
Value to Downtown Portland
Serving Downtown Portland for Over 31 Years

Records furnished by the lottery commission show total sales for the Morrison store the last 13 years of $2,445,773. Substantial portions of lottery sales are distributed to local communities.

Lottery sales at our other two stores have similar totals. Total lottery sales for all three stores for 13 years was $6,676,986.

The last 5 years Morrison paid $7,521 for various licences and permit fees. Total for all three stores was$18,625.

Peterson's employs 25 employees, many long term, over 10 years and even over 20 years. Full time employees are furnished health insurance and vacation time.

Most employees live in the Downtown area or close in areas.

Average payroll taxes deducted for employees is $40,889 per year.