BECKER
STRUCTURAL ENGINEERS

CITY OF PORTLAND, MAINE
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/03/15

September 1, 2015

CWS Architects
434 Cumberland Avenue
Portland, Maine 04101
Attn: Guy Labrecque, Vice President

Unitil Mezzanine Review for File Storage
Riverside Industrial Park
Portland, Maine

Per our agreement, we performed an analysis of the existing mezzanine slab at Unitil in the area where filing has been proposed and based on the information provided. See the attached layout for reference. We understand that the shelving will feature 12 bays of shelving with 5 levels per bay. There will be 6 boxes per shelf per bay, or 30 boxes total in each bay. The total estimated weight would be 14,400 pounds. We reviewed the existing slab for both uniform loading and leg loading.

For uniform loading, if we look at the area directly under the shelving the uniform loading directly below the shelving would be 114 psf which would exceed the uniform loading capacity of the mezzanine which was designed for an 80 psf loading. If we consider a 1 foot clear area around each row of shelving, the uniform loading reduces to about 63 psf. Thus, it is critical that the immediate areas around the shelving be kept clear at all times.

For concentrated loading, we performed basic slab analysis applying a 705 pound leg loading to the slab on a 2.5"x2.5" foot print. Based on our analysis we take no exception to the concentrated loading. Note that the leg loads are at a similar spacing to the joists and this was considered in the design. In the line of the deck span there is only one point loading per joist bay. Under no circumstances should shelving be placed back to back.

We recommend that the loading limitations be posted, including box weight and maximum load per shelf, and that actual box weights be monitored. There is published literature that indicates 8.5x11 paper can weigh in the range of 2.5 to 3 per filed inch, so it's conceivable that the boxes could exceed 40 pounds.

Note that our analysis is limited to the layout shown at the area in question. Should alternate layouts or patterns be considered then they should be analyzed separately.

Please feel free to contact me with any questions you might have.

Sincerely,
**BECKER STRUCTURAL ENGINEERS, Inc.**

STATE OF MAINE
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