# Development Services

## From Concept to Construction

Phone: 503-823-7300 Email: bds@portlandoregon.gov 1900 SW 4th Ave, Portland, OR 97201
More Contact Info (http://www.portlandoregon.gov//bds/article/519984)

## APPEAL SUMMARY

**Status:** Decision Rendered - Held over from ID 15780 (9/6/17) for additional information

| | |
|---|---|
| **Appeal ID:** 15955 | **Project Address:** 1010 NW Flanders St |
| **Hearing Date:** 10/11/17 | **Appellant Name:** Spencer Roedel |
| **Case No.:** B-017 | **Appellant Phone:** 503-224-9560 |
| **Appeal Type:** Building | **Plans Examiner/Inspector:** John Cooley |
| **Project Type:** commercial | **Stories:** 5 **Occupancy:** B, S, M, A-3 Occupied Roof **Construction Type:** III-A |
| **Building/Business Name:** 1010 NW Flanders | **Fire Sprinklers:** Yes - Throughout |
| **Appeal Involves:** Reconsideration of appeal,other: Correction of a violation | **LUR or Permit Application No.:** 16-192301-CO |
| **Plan Submitted Option:** pdf [File 1] [File 2] [File 3] | **Proposed use:** Retail and Office |

## APPEAL INFORMATION SHEET

### Appeal item 1

| | |
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| **Code Section** | 3002 |
| **Requires** | Shaft enclosure per Section 713 |
| **Proposed Design** | A UL listed two hour shaft wall is provided as required by Code, 713.2, and as permitted. The assembly requires that the 1" x 2' shaft liner panels be secured to the Shaftwall stud tracks and transitions with a prescribed screw spacing.<br>The State of Oregon elevator inspector required the contractor to clip the unused exposed threads projecting into the hoistway prior to approval of the hoistway and elevator by the inspector. The screws required by the assembly remain in place, They project still visibly into the hoistway, but the unused threads have been removed although the effective attachment of the shaftliner to the tracks and transitions remains. |
| **Reason for alternative** | The assembly remains as outlined by the UL assembly and Section 713.2; only the unused projecting screw threads have been removed. The screws still visibly project through the tracks and transitions and therefore still secure the hoistway side 1" core board as required by the UL assembly.<br>Representative photographs and correction notice have been provided<br><br>Reconsideration Text - Please see attached engineering report provided by a licensed Fire Protection Engineer. |

## APPEAL DECISION

**Alteration of UL shaft assembly with engineering analysis: Granted as proposed.**

The Administrative Appeal Board finds that the information submitted by the appellant demonstrates that the approved modifications or alternate methods are consistent with the intent of the code; do not lessen health, safety, accessibility, life, fire safety or structural requirements; and that special conditions unique to this project make strict application of those code sections impractical.

Pursuant to City Code Chapter 24.10, you may appeal this decision to the Building Code Board of Appeal within 180 calendar days of the date this decision is published. For information on the appeals process and costs, including forms, appeal fee, payment methods and fee waivers, go to www.portlandoregon.gov/bds/appealsinfo, call (503) 823-7300 or come in to the Development Services Center.

FIRE PROTECTION CONSULTING
3115 NW 132nd Place, Portland, OR 97229-7037
Phone 503-531-8717 Fax 503-531-8564 e-mail djgessert@gmail.com

## *Letter*

| | |
|---|---|
| Date: | October 5, 2017 |
| To: | Fortis Construction<br>1705 SW Taylor Street, #200<br>Portland, OR 97205<br>Sent via email |
| Attention: | Luke Stillar |
| From: | David Gessert, P. E.<br>Fire Protection Engineer |
| Subject/Project: | 1010 NW Flanders Street<br>Elevator Shaft – Clipping of Protruding Screws<br>Fire Protection Analysis |
| Job No.: | 2017-49 |


Total Pages: 3

**Introduction/Executive Summary**

This engineer has been requested to provide an opinion on the clipped screws ends (pointed ends) protruding into the elevator shaft of the 1010 NW Flanders Street project. The following has been reviewed for this report:

- Pictures of the interior of the elevator shaft showing clipped screws
- Literature on the failure of gypsum board in fire conditions
- Phone interview with the Oregon Elevator Program Chief

Based on review of pictures of the clipped screws, gypsum board failure, and talking with the Oregon Elevator Program Chief the clipped screws will have no impact on the ability of the 1010 NW Flanders Street project elevator shaft wall to perform its fire protection design of providing 2 hours of fire resistance.

**Elevator Shaft – Clipping of Protruding Screws – Fire Protection Analysis**

The elevator shaft for the 1010 NW Flanders Street project was constructed per UL Design No. U415 using System B with a 2-hour fire resistance rating. This Listing calls for 1-5/8 inch long Type 3 steel screws were used. With this design and screws the points of the screws protruded into the interior of the elevator shaft by approximately ½ inch plus or minus. The contractor was instructed by the elevator inspector to clip the pointed ends of the screws sticking out into the shaft. This was done to minimize the hazard to those who would enter the shaft.

For the elevator shaft the gypsum board is not used to carry structural loads other than itself, to resist any pressure difference caused by the fire, and at the very end of the ASTM E119 test to stay in place when a fire hose stream is directed at the assembly. The screws are needed to keep the gypsum board in place and the resist these loads but not carry structural loads.

Under fire conditions gypsum board shrinks. The way gypsum board fails during is a fire is after the paper on the surface of the panel burns away water that is bound up chemically is driven off. This process consumes heat which is an important attribute of why gypsum board performs favorably in fire conditions. Thin layers of the material are removed as the water is driven off. Type X gypsum board includes fiber reinforcement which delays the shedding (or ablation) of these thin layers.

Inspection of the interior of the elevator shaft by the General showed at least 80 percent of the screws protruding into the elevator shaft had at least one or more full threads showing on the screws protruding into the elevator shaft. In failure mode a gypsum board screw can break or pull (or push) through the gypsum board/steel framing. If the screw breaks it is immaterial if the pointed end of the screw is clipped off. If the screw is pulled (or pushed) through the gypsum board and/or steel framing more than one thread showing protruding will have no impact on the shaft wall performing its design goal. Said differently once a screw has either been stripped of its threads or has pulled (or pulled) through the surrounding material additional threads protruding into the elevator shaft would make no difference on the outcome.

Information provided by the Oregon Elevator Program Chief reveals that clipping of the pointed ends of screws that protrude into an elevator shaft has been done in Oregon for at least 40 years. An estimate of the number of elevator shafts with clipped screws is 4,000 (based on an estimate of an average of 100 elevator installations statewide per year). Of these approximately 4,000 elevator shafts with clipped screws there are no known cases where the elevator shaft has failed. As of the beginning October 2017 the Oregon Elevator Program will no longer require that protruding screws into elevator shafts be clipped.

**Conclusion**

For this report pictures of the clipped screws protruding into the elevator shaft of the 1010 NW Flanders Street project elevator shaft, gypsum board failure in fire conditions, and talking with the Oregon Elevator Program Chief were reviewed. Based on the preceding the clipped screws will have no impact on the ability of the 1010 NW Flanders Street project elevator shaft wall to perform its fire protection design of providing 2 hours of fire resistance.

**References**

Rahmanian, Ima, *Thermal and Mechanical Properties of Gypsum Boards and Their Influences on Fire Resistance of Gypsum Board Based System*, 2011, School of Mechanical, Aerospace and Civil Engineering, University of Manchester, United Kingdom

UL Design No. U415, BXUV.U415, Last Updated on 2017-08-03, UL Online Certifications Directory (System B – 2 Hour)

End of Report

City of Portland, Oregon - Bureau of Development Services
1900 SW Fourth Avenue Portland, Oregon 97201 | 503-823-7300 | www.portlandoregon.gov/bds
TTY: 503-823-6868 | Inspection Request Line: 503-823-7000

# CORRECTION NOTICE

Owner/Contractor Name FORTIS Constr
Job Address 1010 NW FLANDERS ST
Phone # _____ Permit # 16-192301-CO

**YOU ARE HEARBY NOTIFIED THAT WORK OR CONDITIONS ON THIS PROPERTY DOES NOT CONFORM TO THE REQUIREMENTS OF THE:**

- [x] Building
- [ ] Electrical
- [ ] Mechanical
- [ ] Plumbing
- [ ] Zoning
- [ ] Housing

CODE(S) OF THE CITY OF PORTLAND, OREGON. ITEMS LISTED BELOW MUST BE CORRECTED.

CORRECT THE FOLLOWING ITEMS BY prior reinspection
DATE

Contractor violated construction at fire - resistant rated assembly for Elevator shaft enclosure by drilling tips at fasteners inside the shaft OSSC 713.2 & UL Design # U415.

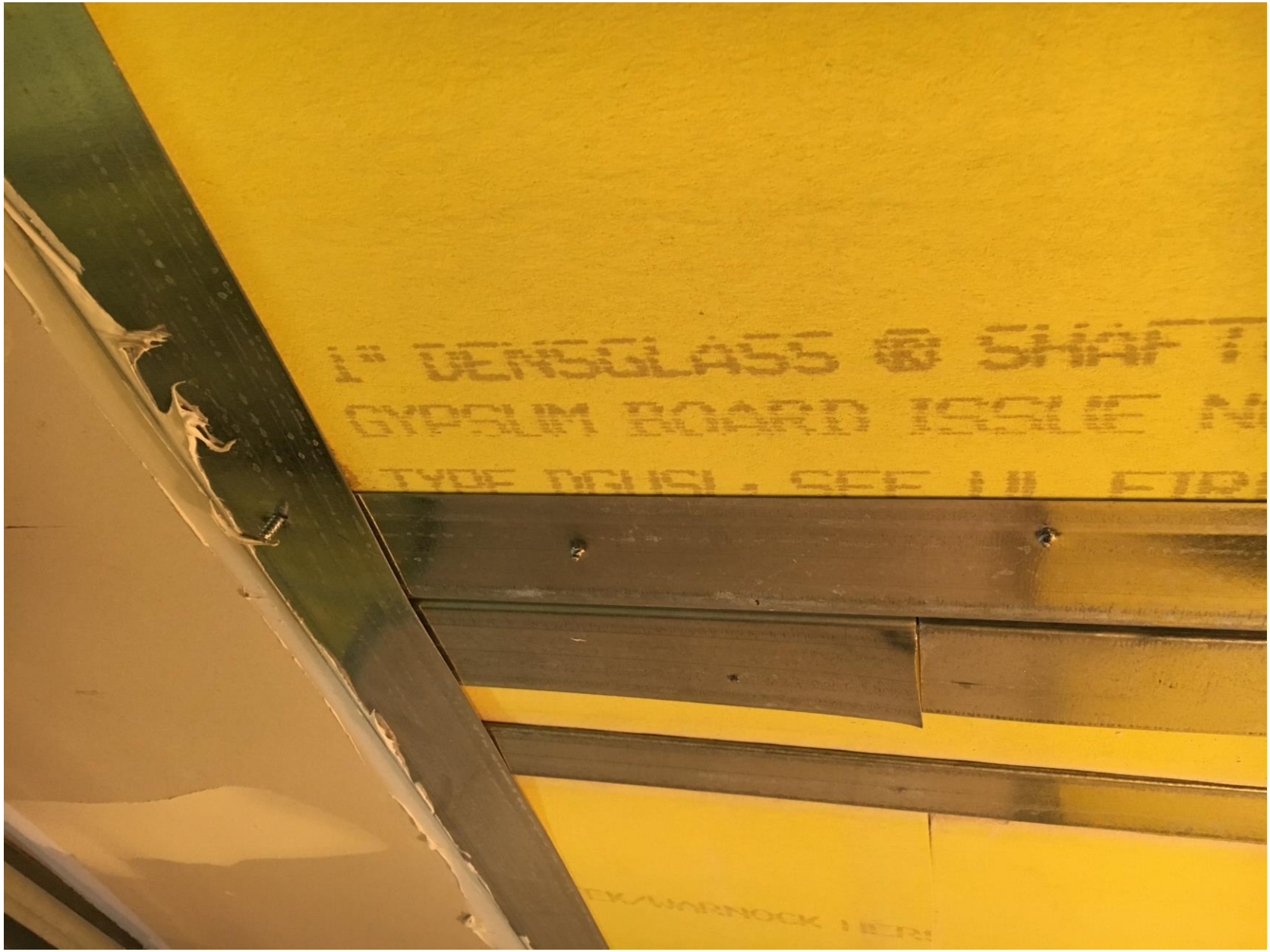
Inspector Y. Vitruk
Ph: 503-823- 6268 Date Issued (Today's Date) 06.21.17

FOR QUESTIONS OR ADDITIONAL INFORMATION, PLEASE CONTACT THE INSPECTOR LISTED ABOVE.

Permit Holder: pink File:canary Inspector: white

FPP_CO insp_correct_notice 02/09/2016

**APPEALS:** Pursuant to City Code Chapters 24.10, 25.07, 26.03, 27.02, and 28.03, the Owner/Contractor may appeal any code provision cited in this Correction Notice to the BDS Administrative Board of Appeal within 180 calendar days from the date of the inspection for which the Correction Notice was issued. For information on the appeals process and costs, including forms, appeal fee, payment methods and fee waivers, go to www.portlandoregon.gov/bds/appeals info or call (503) 823-7335. Permit expiration may not be extended pending resolution of any administrative appeal, upon receipt of a written request to do so and approval of the Building Official.


1" DENSGLASS @ SHAFT
GYPSUM BOARD ISSUE