University of Oregon Environmental Issues Committee
2014-15 Annual Report

During the 2014-15 academic year the Environmental Issues Committee (EIC) met monthly beginning in October (excluding December and May) and concluded in June. Agendas and minutes for each of our meetings are available on the committee website. Below you'll find a summary of our activities, including two recommendations for action: 1) protecting the Agate Hall chimney for Vaux's Swift migratory habitat and 2) Internal carbon pricing.

RECOMMENDATIONS:

I. Agate Hall Chimney

Issue: In April 2014 the EIC was asked to review a draft motion to permanently protect the Agate chimney for Vaux's Swift migratory habitat.

Recommended Action: By unanimous approval of voting members in attendance during the June 2015 meeting, the EIC made the following recommendation:

Given that the University of Oregon Agate Chimney is an ecologically significant stopover site for Vaux's Swifts habitat, including as referenced in the East Campus Plan:

1. The University of Oregon should work to enhance the educational opportunities for campus and community associated with the Agate Chimney, such as installing a webcam or working with Lane County Audubon Society (LCAS) to install interpretive signage, to be paid for by LCAS.
2. The University of Oregon should commit to ongoing maintenance of the Agate Chimney on a regularly scheduled basis to insure its continued structural integrity and preservation as a roosting site.

Note: See Appendices C& D for engineering report and other supporting documentation

II. Internal Carbon Pricing Policy

Issue: The University of Oregon performs a green house gas survey biennially. Given that air travel is one of the largest contributors to the university's emissions, the EIC was asked to review a proposal to price carbon dioxide equivalents related to air travel.

Recommended Action: By unanimous approval of voting members in attendance during the June 2015 meeting, the EIC made the following recommendation:

1. Become nation's first university to have an internal carbon pricing policy. Policy will cover all UO financed air travel.

2. Set price at $30/MTC02e (metric ton of carbon dioxide equivalent)

3. Central Administration places $1-2 million into UO's existing Revolving Loan Fund
   a. Funds the program for the first 2-4 years
   b. Provides units time to prepare to absorb costs
   c. Require Travel Office and Sustainability Office to conduct annual travel audit for top 15 units
   d. Create commodity and/or account codes to improve travel data collection and enable better analysis and reporting
   e. Note: also funds Oregon Model for Sustainable Development energy efficiency in existing buildings

4. Given the complexity, create task force to develop detailed implementation plan for approval. At a minimum this should include:
   a. Faculty/Staff survey
   b. Method for estimating/measuring greenhouse gas emissions arising from UO financed travel
   c. List of affected units
   d. Timeline to transfer responsibility from central administration to units
   e. Types of projects eligible to receive funding from campus carbon tax
   f. List of current qualifying campus projects
   g. Campus Outreach plan
   h. Appropriate policy off-ramps should state or federal carbon pricing occur

OTHER ACTIVITIES:

Comprehensive Environmental Policy: The committee reviewed progress and made suggestions on the Office of Sustainability's survey of existing programs, policies, and plans and how they match the principles outlined in the Comprehensive Environmental Plan. This input will be used to recommend to Jaime Moffitt, Vice President for Finance and Administration, what additional work units should do to meet the CEP principles.

Campus Physical Framework Vision Project: The EIC received a report on the goals and timeline on this project. CPFVP is guided by a 14 member advisory panel is charged with developing a long-term vision for the campus built environment.

APPENDICES

Appendix A: Environmental Issues Committee – Charge and Responsibilities

The Environmental Issues Committee shall:

1) Consider, analyze and report, in the form of advisories or recommendations on environmental issues that affect the quality of life and health of the University community, as well as on those issues about which the University should act as an educational resource. These reports shall include a financial impact statement for each recommendation as well as an informative, impartial summary of the topic that outlines its effects, the issues discussed at committee meetings, and any relevant background information;

2) Recommend development of rules or policies directly related to environmental issues affecting quality of life and health to be adopted by the University administration and/or University Senate on behalf of the University community. Such recommendations shall include a financial impact statement for each recommendation as well as an informative, impartial summary of the topic that outlines its effects, the issues discussed at committee meetings, and any relevant background information;

3) Recommend, facilitate and/or implement educational programs, training sessions, forums or workshops on environmental issues which could be offered to members of the University community and/or the general public;

4) Recommend ways to inform the University community about environmental issues;

In 2007 the University of Oregon became a signatory to the American College and University Presidents Climate Commitment. As a result the University of Oregon is participating in an aggressive effort to address global warming by neutralizing greenhouse gas emissions and accelerating research and educational efforts to equip society to re-stabilize the earth's climate. This commitment will be one relevant principle in guiding the committee's discussions and recommendations.

MEMBERSHIP:
3 - 5 faculty;
3 students who represent a cross-section of students with environmental interests;
2 Officers of Administration;
2 classified staff members;
Director of the Office of Sustainability (Ex-Officio non-voting member);
Associate Director of Environmental Health and Safety (Ex-Officio non-voting member);
AVP for Campus Planning and Real Estate or designate (Ex-Officio non-voting member)
Associate Athletic Director for Facilities or designate (Ex-Officio non-voting member)
ASUO Student Sustainability Coordinator (Ex-officio non-voting member)

STAFFING:
The Office of Sustainability shall provide logistical support for the committee including scheduling meetings, maintaining the EIC listserve and webpage, inviting guest speakers, and generating and distributing meeting minutes. The Director of Sustainability shall work directly with the Chair of the Environmental Issues Committee to develop meeting agendas and brief the committee as needed.

REPORTING:
The Environmental Issues Committee is responsible to the University Administration as an advisor to the Vice President for Finance and Administration. In addition this committee also reports to the University Senate through, at a minimum, an annual written report submitted by the Committee Chair to the Secretary of the University Senate no later than the final University Senate meeting in May. The committee may also make additional written or oral reports to the Senate

Appendix B: 2014-15 Environmental Issues Committee Members

Faculty/Staff
Erin Moore – Architecture (Chair)
Shabnam Akhtari
Brian Gillis – Art
Holly Lynn – Biology
Marie Swarringim – Campus Planning, Design & Construction
Ron Lovinger – Landscape Architecture
Michael Smith—Architecture and Allied Arts
Lisa Wemberley – Unclassified Personnel Services

Students
Ryan Ahrling
Stephen Siperstein
Erin Walker

Ex-Officio
Steve Mital—Office of Sustainability
Doug Brooke—Environmental Health and Safety
Christine Thompson—Campus Planning and Real Estate
Blair Hinton – Athletics
Eric Beeler—Student Sustainability Coalition

Appendix C: Vaux's Swifts Background

Background: The Vaux's swifts (*Chaetua vauxi*) are small aerialist insectivore birds. They do not perch to rest, as songbirds do, but spend their entire day on the wing. They migrate from Central America to the Pacific Northwest in the spring (mid-April to mid-May) where they then set up nests in the forested areas. At the end of their summer breeding season, they gather again into migrating flocks and use the chimneys in the Fall as they prepare for the south-bound migration.

The use of the Agate Hall chimney has been observed and reported for only a few nights each migration and yet it is one of the top chimneys used by migrating Vaux's swifts. A total of 57,397 swifts were counted in only 15 evenings last fall. Agate Hall is one of the most highly used chimneys in the migration flyway. See the 2013 Agate Hall chimney data at: http://www.vauxhappening.org/WOR_South_2013.html

The Lane County Audobon Society, whose leadership includes UO faculty and staff request that the UO permanently protect the chimney for the Swifts.

Investigation: In 2013, there was some confusion regarding the proper role for EIC given recent changes to the relationship between the Faculty Senate and UO Administration. Both Jamie Moffitt, Vice President for Finance and Administration, and Margie Paris, University of Oregon Senate President (2013-14) agreed that the EIC should discuss the draft Swift motion with relevant administrators and operations staff and incorporate that feedback into its final recommendation. Based on this direction, the following information from relevant campus units was collected:

1. **Campus Planning, Design, and Construction** notes that the University of Oregon already offers some long-term protection of the chimney. The University of Oregon's East Campus Development Policy (p7) states: *"The playground near 19th Avenue and the potential historic significance of Agate Hall should be taken into consideration when development occurs. In addition, the importance of preserving the Agate Hall chimney as a roosting area for the migrating chimney swifts should continue to be recognized."*

2. In 2013, **Campus Operations** spent approximately $17,000 cleaning 30 years of accumulated Vaux's Swift guano from the chimney. Campus Operations estimates that annual maintenance going forward will be minimal and can absorb it within its existing budget.

3. **Environmental Health and Safety** says the swifts pose no risk to human health.

4. **Enterprise Risk** stated concerns that the chimney was a seismic risk. In response to that concern, a structural evaluation by Gralund Engineering was contracted to assess that risk. That report is provided in **Appendix D**.

Appendix D: Gralund Engineering Structural Evaluation (Starts on next page):

GRALUND ENGINEERING, INC.

CONSULTING
STRUCTURAL
ENGINEERS

June 5, 2015

University of Oregon
1276 University of Oregon
Eugene, Oregon 97403

Attn: George Hecht

RE: Agate Hall Boiler Chimney Evaluation

Gralund Engineering, Inc. was retained to perform a structural evaluation of the concrete boiler chimney at Agate Hall. The purpose of this evaluation was to determine if the chimney was structurally sound and adequate for the loads imposed, specifically for seismic forces.

Background Information

Agate Hall is located near the corner of Agate Street and 18th Avenue, on the east side of the University of Oregon main campus in Eugene, Oregon.

The structure was originally built in 1924. The chimney originally serve as the boiler exhaust for the building. The height of the chimney is 65 feet. Upgrades to the mechanical systems in the building have resulted in the chimney not being used for this purpose any longer.

The original construction of the chimney is an 8 inch concrete walls with 5½ inch firebrick lining the chimney. From the foundation to the upper roof at 31 feet the chimney is constructed integral with the wall and floor construction. On the exterior of the chimney there is approximately 1 inch of stucco finish on the exterior. The chimney above the roof elevation is reinforced with ½" square vertical bars in the corners of the chimney and 3/8" diameter horizontal ties at approximately 48 inches on center. Documentation on the reinforcement of the chimney below the roof elevation cannot be determined. No documentation was available that specified the concrete and reinforcement yield strengths.

In 1998, M. R. Richards Engineering, Inc. was retained to perform a seismic evaluation of the chimney and recommended that guy wire bracing be installed at an elevation of 51 feet and anchored to the walls of the lower structure. This recommendation has been installed and now an existing condition for purpose of the evaluation.

In 2014, Evergreen Engineering, Inc. again reviewed the structural adequacy of the chimney for seismic and wind lateral forces.

Project Scope

The scope of this structural evaluation and report was limited to data collected through the following means:

1. Review of documents available,
    a. On the original construction.
    b. M. R. Richards Engineering, Inc. 1998 seismic upgrades.
    c. Evergreen Engineering, Inc. 2014 evaluation.

2. Site observations on April 21 and May 4, 2015.
3. Calculations of structural condition based on data gathered.
4. Chimney modeled in Risa-3D, a structural analysis/design software package.

Observations

Visual observations of the chimney has shown that the stucco finish applied to the building is in need of maintenance. There are numerous cracks and sections of the stucco has spalled off the structure. The condition of the concrete cannot be determined without removing the exterior finish. Cracking was observed in the location of the anchor bolts on the upper wall. It is not known if the depth of embedment of the anchor bolts included the thickness of the stucco finish or additional depth of anchorage was used to account for the finishes.

Observations of the anchor bolts and cabling added in 1998 to act as guy wire supports for the chimney were conducted and no deficiencies or unusual wear was found.

Risa-3D analysis software was used to analyze the structure. The computer model of the chimney included the chimney above the roof elevation (30 feet to 65 feet) and all upgrades from the 1998 analysis and retrofit. The chimney is considered under reinforced with the minimal amount of vertical reinforcing present in the wall. The model was analyzed for lateral forces in accordance with the current 2014 Oregon Structural Specialty Code.

Results from the computer model was compared to calculated allowable stresses for the concrete and the anchorages of the guy wires. The stresses for concrete were compared to the modulus of rupture of the concrete due to being under reinforced. The anchorages were reviewed for an embedment 1 inch less than the embedment specified in the 1998 upgrades utilizing the design approach outlined in ACI 318-11 for uncracked concrete (wind loads combinations) and cracked concrete (seismic load combinations).

Limitations

This structural evaluation report is not intended to identify all defects in the existing workmanship or all potential hazards. This report is based on the site observations of exposed to view structural conditions and the review of existing record drawings made available to Gralund Engineering, Inc. Intent is to offer an assessment based on the current code design requirements. Damage of the structure including collapse of the chimney will still be possible given circumstances beyond the scope of this report.

Conclusions

The structural condition of the chimney including the anchorage of the guy wires is sufficient for the required loads based on the limitations outlined above.

If you have any questions regarding this report, please do not hesitate to call.

Thank you

Matthew Gralund SE
President/Principal

Attachements: Calculations

GRALUND ENGINEERING, INC.	Project No. 150403	Sheet No. 1
Project: AGATE HALL CHIMNEY EVALUATION		Date: 6-3-15
Subject		By: MSG

SCOPE: REVIEW OF CHIMNEY FOR CURRENT LOADS

REFERENCES: 2014 OSSC
ASCE 7-10
ACI 318-11

DESIGN CRITERIA:

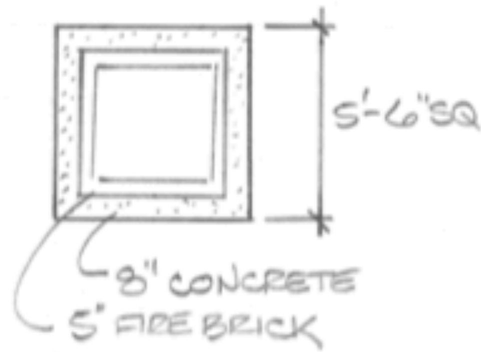
WEIGHT

AREA CONCRETE

$A_C = (66)^2 - (66-16)^2$
$= 1856 \text{ in}^2 \sim 12.89 \text{ ft}^2$

AREA FIRE BRICK

$A_B = (50)^2 - (40)^2$
$= 900 \text{ in}^2 \sim 6.25 \text{ ft}^2$



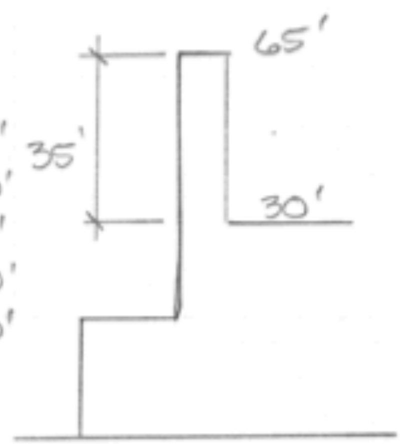
UNIT WEIGHTS

CONCRETE = 145 pcf
FIREBRICK = 150 pcf

WEIGHT = 145(12.89) + 150(6.25) = 2806 plf

WIND LOAD - COMPONENT & CLADDING

BUILDING OCCUPANCY CATEGORY II
BASIC WIND SPEED V = 120 MPH
WIND DIRECTIONALITY $K_d = .90$ SQUARE CHIMNEYS
EXPOSURE CATEGORY C
TOPOGRAPHIC FACTOR $K_{zt} = 1.0$
GUST EFFECT FACTOR G = .85
EXPOSURE COEFFICIENT $K_z = .98$ 30'
= 1.04 40'
= 1.09 50'
= 1.13 60'
= 1.17 70'



VELOCITY PRESSURE

$q_z = 0.00256 K_z K_{zt} K_d V^2$
$= 0.00256 K_z (1.0)(.90)(120)^2 = 33.18 K_z$

GRALUND ENGINEERING, INC.

Project No.	Sheet No.
150403	2

Project	Date
AGATE CHIMNEY EVALUATION	6-3-15
Subject	**By**
	MSG

DESIGN CRITERIA (CONT):

WIND LOAD

EXPOSURE COEFFICIENT @ 65' = 1.15 BY INTERPOLATION

$q_{z30} = 33.18(.98) = 32.5\,psf\,(5.5) = 178\,plf$

$q_{z65} = 33.18(1.15) = 38.2\,psf\,(5.5) = 210\,plf$

SEISMIC LOAD

LATITUDE = 44.040° LONGITUDE = -123.069°

FROM USGS SEISMIC WEBSITE

$S_{DS} = 0.608$ $S_{D1} = 0.427$

SEISMIC DESIGN CATEGORY D BASED ON S_{DS}

IMPORTANCE FACTOR $I_e = 1.0$

ESTIMATED FUNDAMENTAL PERIOD

$$T = 2\pi\sqrt{\frac{\Sigma f_i \delta^2}{g\Sigma f_i \delta}} = 2\pi\sqrt{\frac{0.001}{g}} = 0.035\,s$$

CONCRETE CHIMNEY $R = 2.0$ ASCE 7-10 TABLE 15.4-2

$\Omega = 1.5$

$C_d = 2.0$

$$C_S = \frac{S_{DS}}{R/I_E} = \frac{.608}{2/1} = .304 \leftarrow \text{CONTROLS}$$

$$C_{SMAX} = \frac{S_{D1}}{T\,R/I_E} = \frac{.427}{.035(2/1)} = 6.100$$

$C_{SMIN} = 0.044\,S_{DS}I_E = 0.027$

$$C_{SMIN2} = \frac{.5S_1}{R/I_E} = \frac{.5(.400)}{2/1} = 0.100$$

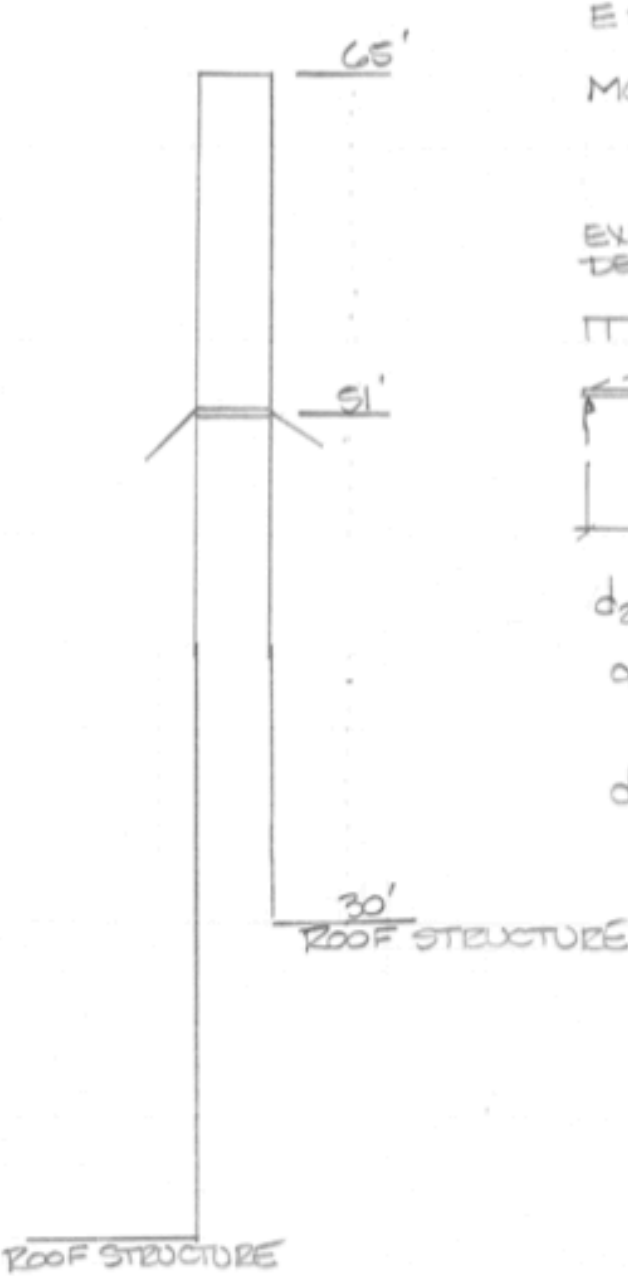
$V = C_S W = .304\,W$

WEIGHT SEISMIC = .304(2806) = 853 plf

BASE SHEAR = 853 plf(35) = 29.85 k

GRALUND ENGINEERING, INC.

Project No. 150403	Sheet No.
Project: AGATE HALL CHIMNEY EVALUATION	Date: 6-3-15
Subject	By: MSG

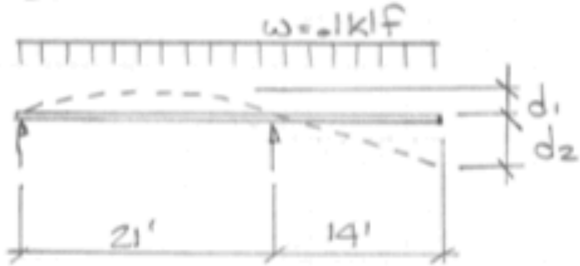


$E \approx 57000\sqrt{f'c} \approx 2.85E6$ psi

MOMENT OF INERTIA W/O FIREBRICK

$I = \frac{66^4 - 50^4}{12} = 1.06E6\ in^4$

EXISTING BRACE AT 51' RESTRAINS DEFLECTION



$d_2 = \frac{w x_1}{24EI}(4a^2L - L^3 + 6a^2x_1 - 4ax_1^2 + x_1^3)$

$a = x_1 \therefore (4a^2L - L^3 + 6a^3 - 4a^3 + a^3)$

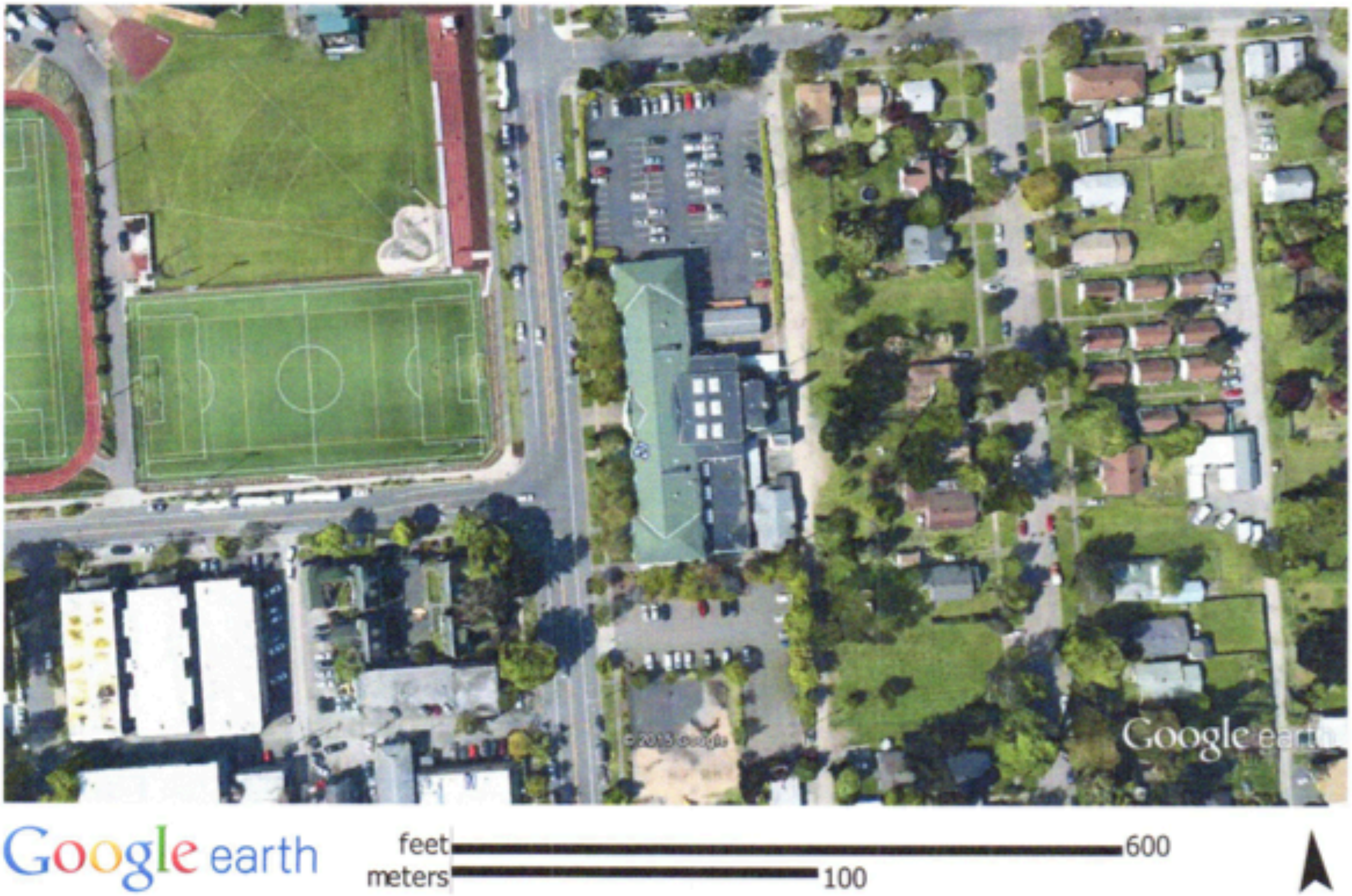
$(4a^2L - L^3 + 3a^3)$

$d^2 = \frac{.1(14)}{24EI}\left[4(14^2)(21) - 21^3 + 3(14)^3\right]$

$= \frac{1.4k}{24EI}(15435 ft^3)(1728 \frac{in^3}{ft^3})$

$= \frac{1555848\ in^3 \cdot k}{E\ (1.06E6\ in^4)} = \frac{1.468}{E} \frac{k/in}{k/in^2}$

$= \frac{1.468}{2.85E3} = 0.001$


Google earth
Google earth
feet
600
meters
100

USGS Design Maps Summary Report

User–Specified Input

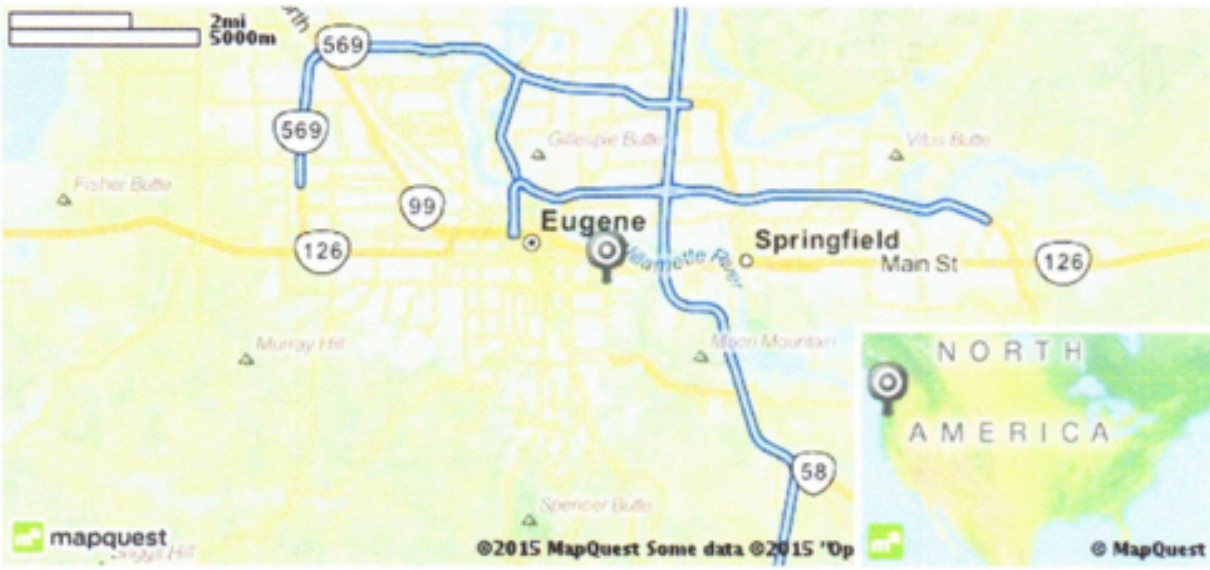
Report Title Agate Hall, University of Oregon
Wed June 3, 2015 21:11:51 UTC

Building Code Reference Document ASCE 7-10 Standard
(which utilizes USGS hazard data available in 2008)

Site Coordinates 44.04°N, 123.069°W

Site Soil Classification Site Class D – "Stiff Soil"

Risk Category I/II/III

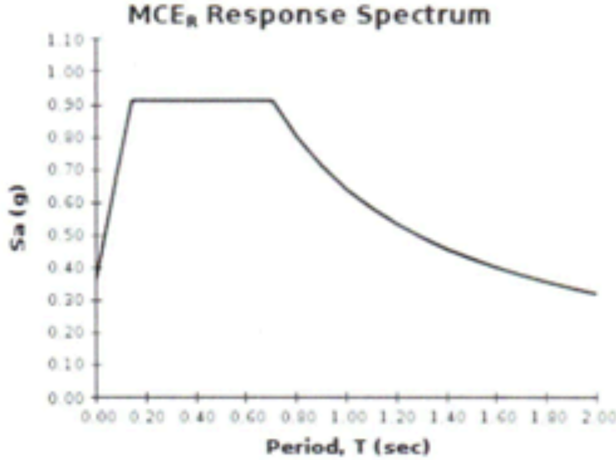


USGS–Provided Output

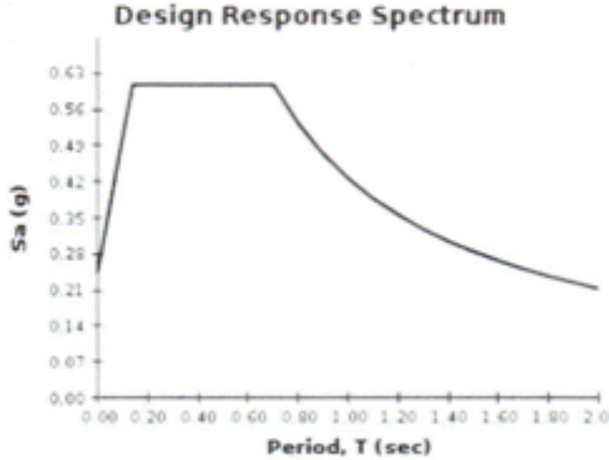
$S_S =$	0.763 g	$S_{MS} =$	0.912 g	$S_{DS} =$	0.608 g
$S_1 =$	0.400 g	$S_{M1} =$	0.640 g	$S_{D1} =$	0.427 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.

MCE_R Response Spectrum



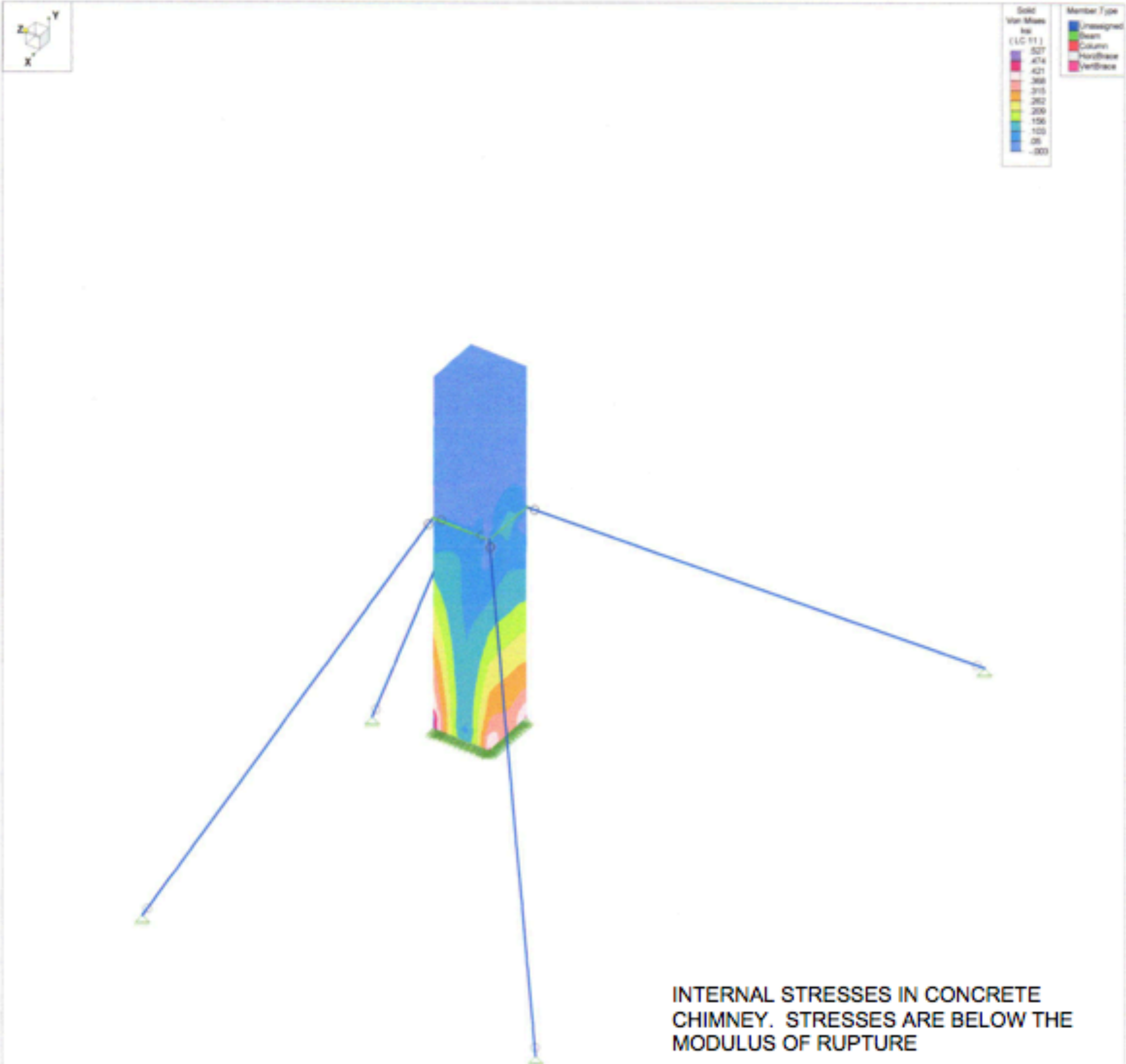
Design Response Spectrum



For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	NW1	0	.073	0	0	0	0
2	1	NE1	0	.072	0	0	0	0
3	1	SW1	0	.073	0	0	0	0
4	1	SE1	0	.072	0	0	0	0
5	1	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
6	2	NW1	0	.062	0	0	0	0
7	2	NE1	0	.062	0	0	0	0
8	2	SW1	-.017	.048	-.014	0	0	0
9	2	SE1	0	.062	0	0	0	0
10	2	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
11	3	NW1	.013	.052	-.011	0	0	0
12	3	NE1	0	.062	0	0	0	0
13	3	SW1	-.013	.052	-.011	0	0	0
14	3	SE1	0	.062	0	0	0	0
15	3	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
16	4	NW1	.017	.049	-.014	0	0	0
17	4	NE1	0	.062	0	0	0	0
18	4	SW1	0	.062	0	0	0	0
19	4	SE1	0	.062	0	0	0	0
20	4	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
21	5	NW1	0	.062	0	0	0	0
22	5	NE1	.001	.058	.002	0	0	0
23	5	SW1	0	.062	0	0	0	0
24	5	SE1	-.001	.058	.002	0	0	0
25	5	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
26	6	NW1	0	.047	0	0	0	0
27	6	NE1	0	.046	0	0	0	0
28	6	SW1	-.049	.007	-.041	0	0	0
29	6	SE1	-.01	.018	.014	0	0	0
30	6	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
31	7	NW1	.041	.014	-.033	0	0	0
32	7	NE1	0	.046	0	0	0	0
33	7	SW1	-.041	.014	-.033	0	0	0
34	7	SE1	0	.046	0	0	0	0
35	7	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
36	8	NW1	.049	.008	-.04	0	0	0
37	8	NE1	.01	.019	.014	0	0	0
38	8	SW1	0	.047	0	0	0	0
39	8	SE1	0	.046	0	0	0	0
40	8	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
41	9	NW1	0	.047	0	0	0	0
42	9	NE1	.014	.008	.019	0	0	0
43	9	SW1	0	.047	0	0	0	0
44	9	SE1	-.014	.008	.019	0	0	0
45	9	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
46	10	NW1	-.016	.047	0	0	0	0
47	10	NE1	-.016	.046	0	0	0	0
48	10	SW1	-.46	-.306	-.365	0	0	0
49	10	SE1	-.142	-.302	.171	0	0	0
50	10	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
51	11	NW1	.376	-.251	-.325	0	0	0
52	11	NE1	0	.046	-.016	0	0	0
53	11	SW1	-.376	-.251	-.325	0	0	0
54	11	SE1	0	.046	-.016	0	0	0
55	11	COG (ft):	X: 2.75	Y: 17.469	Z: 2.744			
56	12	NW1	.459	-.305	-.364	0	0	0

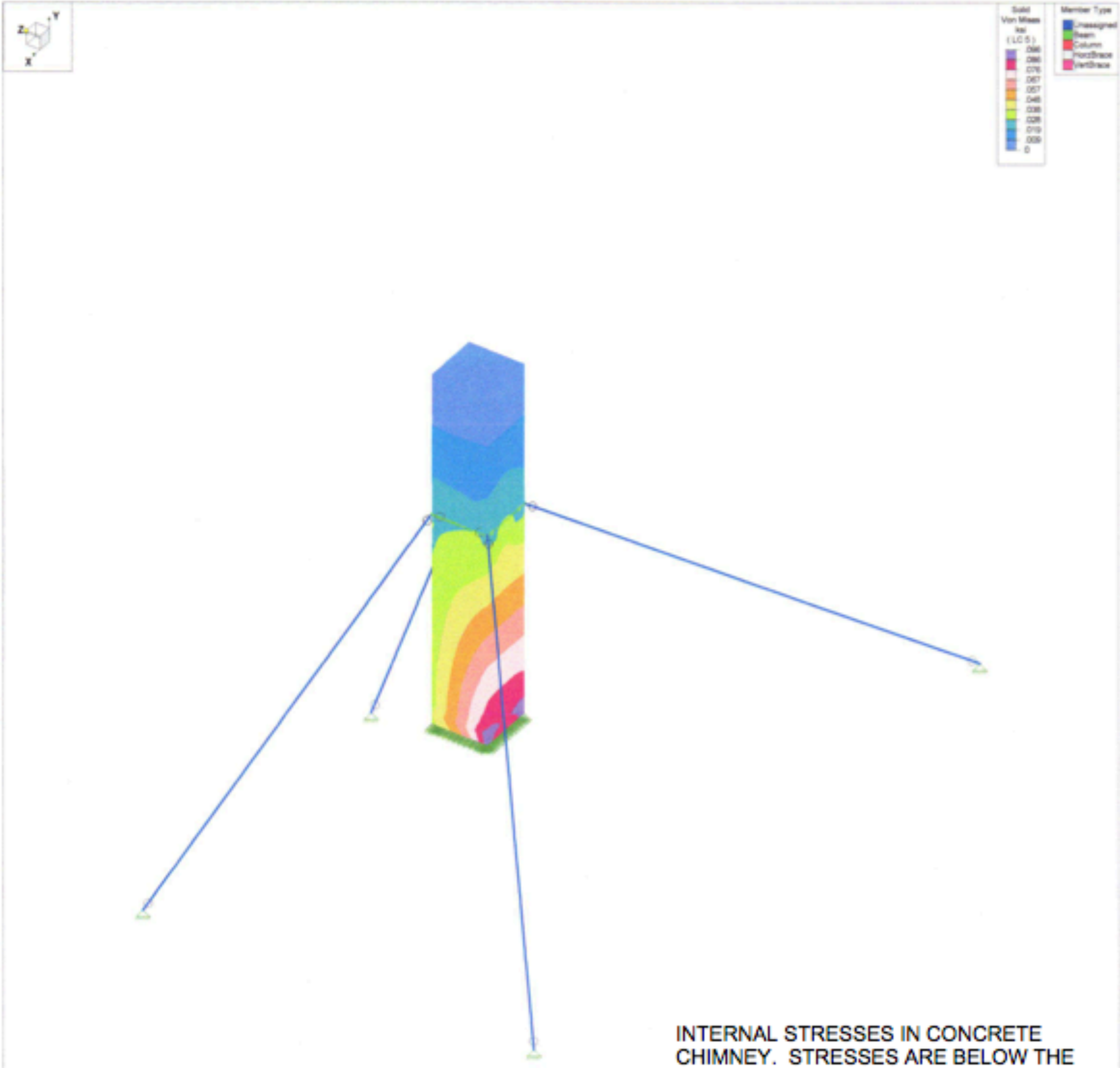


INTERNAL STRESSES IN CONCRETE CHIMNEY. STRESSES ARE BELOW THE MODULUS OF RUPTURE

Results for LC 11, IBC 16-7 (b)

SK - 1

June 4, 2015 at 8:26 AM



INTERNAL STRESSES IN CONCRETE CHIMNEY. STRESSES ARE BELOW THE MODULUS OF RUPTURE

Results for LC 5, IBC 16-3 (b) (d)

SK - 2

June 4, 2015 at 8:27 AM

150403 - Agate Chimney 150603.r3d

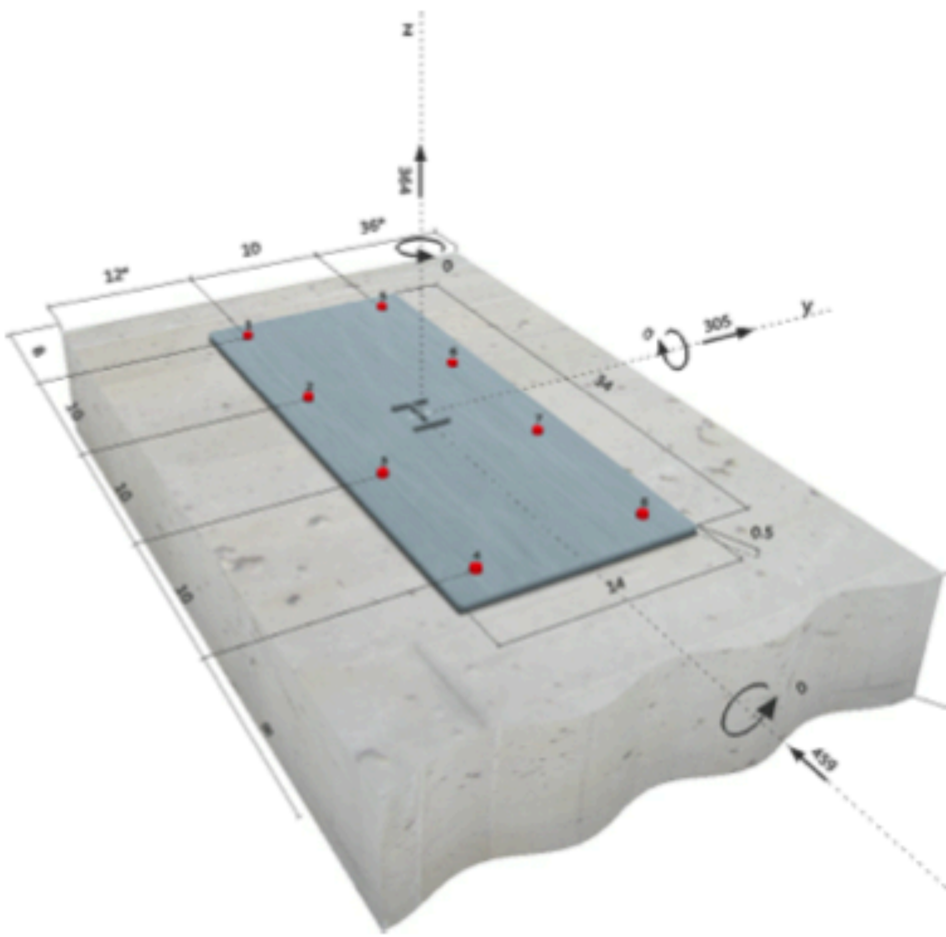
Company:		Page:	1
Specifier:		Project:	
Address:		Sub-Project I Pos. No.:	
Phone I Fax:	|	Date:	6/8/2015
E-Mail:			

Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-RE 500-SD + HAS 5/8**
Effective embedment depth:	$h_{ef,opti}$ = 3.125 in. ($h_{ef,limit}$ = 6.500 in.)
Material:	5.8
Evaluation Service Report:	ESR-2322
Issued I Valid:	1/1/2015 | 4/1/2016
Proof:	Design method ACI 318-08 / Chem
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate:	l_x x l_y x t = 34.000 in. x 14.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.
Base material:	cracked concrete, 3000, f_c' = 3000 psi; h = 8.000 in., Temp. short/long: 32/32 °F
Installation:	hammer drilled hole, Installation condition: Dry
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F)	no

Geometry [in.] & Loading [lb, in.lb]



Company:		Page:	2
Specifier:		Project:	
Address:		Sub-Project I Pos. No.:	
Phone I Fax:	|	Date:	6/8/2015
E-Mail:			

2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Bond Strength	364	15370	3 / -	OK
Shear	Concrete edge failure in direction x-	551	7662	- / 8	OK

Loading	β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
Combined tension and shear loads	0.024	0.072	5/3	2	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

4 Remarks; Your Cooperation Duties

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