STABILITY ENGINEERING INC.

P.O. Box 2646 • Corvallis, Oregon 97339 • p: 541.223.5360 • f: 541.223.5278



May 15, 2022

Project Name: Wilco
Project Address: W 11th & Willow Creek
Permit Number: 23-01679-01

**RE: Structural Response to Plan Review for Wilco in Eugene, OR**

We have reviewed the structural comments provided and have found the following:

**STRUCTURAL**

**S1 - 06_S0.0 STRUCTURAL NOTES.pdf, page 1**
Special inspection of mechanical and electrical equipment and their structural supports is required for the sprinkler systems unless flexible hose fittings are used. (OSSC 1705.12.6 item 6)

- A note has been added to S0.0 regarding sprinkler special inspection as well as a deferred submittal list.

**S2 - 06_S0.0 STRUCTURAL NOTES.pdf, page 1**
Please provide a list of deferred structural submittals (e.g., roof open-web steel joists). (OSSC 107.3.4.1)

- A deferred submittal list has been added to S0.0.

**S3 - 06_S1.0 FOUNDATION PLAN.pdf, page 1**
Indicate the location and extent of the facade stem wall (det. C/S3.3) on the foundation plan. (OSSC 107.2.1)

- Notes have been added to S1.0 referencing detail C-S3.3 and the architectural plans. The architectural plans should provide the width of the facade section that would be required for the stem wall.

**S4 - 06_S1.0 FOUNDATION PLAN.pdf, page 1**
Specify the three CMU piers on line F between lines 6 and 7. They appear to be type P1. (OSSC 107.2.1)

- The CMU wall between the "L1" windows are to be reinforced per detail C-S4.1. This is called out on the Lintel reinforcement schedule.

**S5 - 06_S2.0 ROOF FRAMING PLAN.pdf, page 1**
Please clarify the wall anchorage and sub-diaphragm design for the east and west walls. It does not appear that the joist girders are anchored to the walls or have been detailed to form continuous ties. Ledger anchorage (det. A/S4.2) is adequate, but there does not appear to be a load path to transfer out-of-plane wall forces into the diaphragm or distribute them to the perpendicular walls. (OSSC 1604.4; ASCE 7 12.11.2)

- The metal deck is designed for direct transfer of lateral and out of plane forces to and from the steel angle ledger. See page 20 of the calculations for attachment and deflection checks.

**S6 - 06_S2.1 ENLARGED ROOF FRAMING PLAN.pdf, page 1**

Please clarify the lateral force resisting systems for the structures shown on this sheet. Wind loads applied to portions of the entry-facade and tower-facade projecting above the main building roof should be designed as rooftop structures and subject to the wind load factors of ASCE 7 29.4.1. (OSSC 1609.1, 1613.1)

- Facade/Entry: The wood framed roof diaphragm is laterally tied to the main building cmu wall and the entry cmu wall. Where the wood framed diaphragm isn't directly attached to the cmu, there are wood framed shear walls transferring loads from the diaphragm down to the cmu walls. Every other truss is attached to the main building cmu wall with tension ties to resist all pullout forces. See sheet S3.1 for details and page 50 of the revised calculations.
- Loading Cover: The wood framed roof diaphragm is laterally tied to the main building cmu wall and the CFS shear wall at the opposing end. The glulam beams running perpendicular to the main cmu wall are attached with large steel buckets (See C-S3.2) that resist gravity loads as well as pullout forces. See sheet S3.2 for details and page 56 of the revised calculations.
- Back Corner Facade: The CFS framed roof diaphragm is laterally tied to the CFS framed shear walls. The CFS framed shear walls are framed down to the main building cmu walls and steel reinforcement in the main roof system. The shear walls have holdowns spaced at 4'-0" o.c. to resist all uplift forces. See sheet S3.3 for details and pages 62 & 66 of the revised calculations.

**S7 - 06_S2.1 ENLARGED ROOF FRAMING PLAN.pdf, page 1**

Detail A: Please clarify the wall framing at the center section of the facade. The foundation plan appears to show solid CMU wall in center section. (OSSC 107.2.1)

- There is a glulam beam that runs across the top of the solid grouted cmu wall and extends out to cmu columns on both sides of the vestibule area. The glulam beams support the entry facade trusses.

**S8 - 06_S3.2 SECTIONS.pdf, page 1**

Provide positive attachment between the facade roof structure and the CMU wall to resist the nominal lateral forces of ASCE 7 12.1.3.

- The roof diaphragm nails directly to a ledger that is attached to the main cmu wall. The ledger was designed to transfer the lateral forces to the cmu wall. Pullout forces are resisted by the glulam beams that the trusses set on.

**S9 - 06_S3.2 SECTIONS.pdf, page 1**

Detail A: Please specify the CFS track attachment to the beam and CMU and the CFS stud attachment to the HSS columns at the corners. (OSSC 107.2.1)

- Notes have been added to detail A-S3.2 and D-S3.3 calling out the required track attachment.

**S10 - 06_S3.2 SECTIONS.pdf, page 1**

Detail C: Please verify that the Titen screw spacing meets the manufacturer specifications and that the connection has adequate tension capacity to resist reactions due to lateral forces on the loading cover structure. (OSSC 1604.2)

- This bracket was based directly off of a bracket from the Simpson catalog. The proposed bracket meets the minimum requirements for Titen HD installation and has enough capacity to resist gravity and pullout loads.

**S11 - 06_S3.3 SECTIONS.pdf, page 1**
Detail C: The typical CMU wall footing detail (F/S4.0) shows the wall centered on the footing. This detail shows the CMU wall offset from the centerline of the footing. Please clarify the transition from detail F/S4.0 to detail C/S3.3. (OSSC 107.2.1)

- The footing was moved to be shown centered on the cmu wall. No transition is required.

**S12 - 06_S4.0 STRUCTURAL DETAILS.pdf, page 1**
Detail B: Please show the layout of the vertical bars at the pilaster. (OSSC 107.2.1)

- B-S4.0 has been updated to show the vertical bar layout.

**S13 - 06_S4.1 STRUCTURAL DETAILS.pdf, page 1**
Detail D: Clarify - the vertical reinforcement is shown in section B-B of detail C; not on the schedule on S1.0. (OSSC 107.2.1)

- The vertical and horizontal reinforcement above the L2 lintel is called out on the notes section of the cmu wall schedule on S1.0. Section B-B on detail C-S4.1 is specifically for C-S4.1.

**S14 - 06_S4.1 STRUCTURAL DETAILS.pdf, page 1**
Detail B: TMS 402 7.3.2.6(d) requires that horizontal reinforcement in special masonry shear walls be hooked around vertical reinforcement at wall ends. This requirement appears to apply to all horizontal reinforcement and is not satisfied by hooking one of the two horizontal bars.

- The detail was revised to show both horizontal bars hooking the vertical end bars.

**S15 - 12_M1.0 HVAC PLAN.pdf, page 1**
Provide seismic anchorage calculations and details for mechanical and electrical components that weigh more than 400 lbs and are mounted less than four feet above the adjacent floor or roof level or that weigh more than 75 lbs and are mounted more than four feet above the adjacent floor or roof level. (OSSC 1613.1, 1613.4.2; ASCE 7-16 13.1.4)

- By others.

**S16 - Hay Shed Structural Calculations.pdf, page 7**
Page 6: Please clarify how the forces used for anchor rod design have been determined. The forces shown on this page do not match those computed on pp 1-4. Additionally, it is not clear if the governing lateral forces are based on wind loads or seismic loads with the amplified seismic force. Seismic design has been set to "no" on this page. Please verify whether amplified seismic loads have been used and whether the anchor capacity should include reductions for seismic forces. (OSSC 1604.2; ACI 318-19 Ch. 17)

- Pages 1-4 of the calculations are using ASD load combinations, but the anchorage software requires the loads to be input with strength design. There is an off-page conversion between the two. The lateral and uplift loads at the anchors are controlled by wind.

**S17 - 07_A301 EXTERIOR ELEVATIONS.pdf, page 1**
Detail B6: Saw cutting the CMU bed joint for installation of flashing reduces the effective moment of inertia of the CMU wall. Please verify the adequacy of the wall to resist out-of-plane loads. (OSSC 1604.2)

- The cmu walls are fully grouted and are utilizing 60% or less of their bending capacity, per the calculations. The vertical rebar is designed to take majority of the tension forces and the cut does not affect compression capacity. A 3" saw cut for flashing is structurally adequate.

Please let us know if you have any questions.

Sincerely,

Stability Engineering, Inc.

By: _____

Paul Schroeder, P.E., Project Engineer