

ARCHITECTURAL INNOVATIONS, P.S.

Forward Thinking Design Solutions For Your Environment

October 16, 2020

City of Mercer Island
Attn: Development Services Group
9611 SE 36th Street
Mercer Island, WA 98040

RE: AI Job #19037

Project Address: 7233 80th Ave SE

Attn: Norine Allerdice

Subject: Permit No. 2008-182

General: (Ruji Ding)

1. A drainage memo has been provided
2. Added sheet C4.4 to the plan set for drainage & grading.

Planning: (Robin Proebsting)

- Demolition has already been completed (1906-261).
- The setback has been corrected.

Trees: (John Kenney)

- Arborist report has been provided.
- Drip lines are shown on both the architectural and civil site plan.
- There are no exceptional trees on this lot.
- Tree fencing has been added.

Building: (Crystal Kolke)

Nonstructural

1. The scale has been corrected to 1"=10'-0".
2. A north arrow has been added.
3. The developer owns both properties. Also more than likely the excavation for this house will occur before the neighboring property is even a legal lot.
4. Noted the wall on the front elevation and also on sheet A3.
5. Added detail 6/SD.01 reference to sheet A2.0.
6. Added note P-2.
7.
 - a. Corrected the detail reference
 - b. Revised the three floor plans to better show the handrails and noted them.
 - c. See detail 8/D1. Also detail 4/D1 notes the handrail requirements. Added a reference to detail 8/D1 to note P-18
 - d. Added the handrail and guardrail to sheet A2.1. Note P-9 notes the rise and run requirement.
8.
 - a. Revised the window operations on sheet A8 so that there is not an operable window above the window well.

- b. Sheet A8 notes the top of the window at 9'-5 3/8" and sheet A5 notes that window as 7'-0" tall therefore the sill will be at 2'-5 3/8".
- 9. Added note P-4 for safety glazing at the bathroom window.
- 10. Both sills are more than 6' above the landings.
- 11. Added the glazing requirement to detail 7/D1 and the typical building materials on sheet A9.
- 12. Added the missing smoke alarms.
- 13. Noted the treated sill on detail 2/D1 and revised the note from 1" to 2" space on 3/D1. Please see response letter from Mulhern+Kulp in regards to detail 1/SD.01.
- 14. Added detail 9/D1 and added references to the detail on sheets A3 and A7.
- 15. I kept note FP-3 as is since a vapor retarder is not required at garages per IRC R506.2.3 exception #1. I revised note FP-4 to note the vapor retarder requirements since it was not being used and I added the FP-4 callout at the basement slab.
- 16. Revised the note for the unvented space on sheet A9.

Energy & Ventilation

- 1. a. Corrected the form.
- b. Corrected the form.
- 2. Noted the max. BTU on sheet A2.1.
- 3. Added R-5 to the thermal bread note on detail 2/D1. Detail 6/D1 is a window well detail.
- 4. Added to the typical building materials on sheet A9.
- 5. Added note to sheet A9
- 6. Added note to sheet A9.
- 7. The information in the symbols and legend block is correct and is the same information on all 3 floor plans.
- 8. Added to the symbols and legend block on each of the floor plans.
- 9. Added note to sheet A9.
- 10. Added sheets M1-M3.

Structural

Please see the attached response letter from Mulhern+Kulp. Plans have been updated per the redlines provided by the engineer.

Respectfully,

Scott McMillen, Project Manager
Architectural Innovations, P.S.



October 13, 2020

Scott McMillan

ARCHITECTURAL INNOVATIONS

14311 SE 16th St.
Bellevue, WA 98007

PRATT PLAT – LOT 4

PLAN REVIEW COMMENTS

M+K Project #: 203-20001

Reference

Structural Plans, designed by Mulhern + Kulp, prepared by Architectural Innovations
Structural Notes & Details, prepared by Mulhern + Kulp
Structural Calculations, prepared by Mulhern + Kulp

Scott,

Pursuant to your request, we are providing this letter to address the structural items resulting from the above referenced plan review comments for the above referenced single-family home in the city of Mercer Island. Below, please find the review comment, followed by our response.

PLAN REVIEW COMMENTS

Non-Structural

- *Comment 13: A3. IRC R317.1 requires wood framing members that rest on concrete to be not less than 8" from exposed ground unless they are pressure-treated and wood siding, sheathing, and wall framing to have a not less than 6" from ground or 2" from concrete unless it is pressure-treated. Please review your details to make sure that this information is called out and to coordinate architectural and structural details. For example, refer to Details 2 & 3/D1 and 1/DS.01.*
Response: The current structural details specify "P.T." sill plates in contact with the concrete stem wall. The framing above is specified as 8" min above the exterior grade, and therefore does not need to be specified as pressure treated.

Structural

- *Comment 1: Clarify the following in the Structural Notes, Sheet S-0.0:*
 - Under General Framing there are two notes specifying LVL members; however, they have different specifications.*
 - Please specify a 6-mil polyethylene vapor retarder at the garage slab per IRC R506.2.3.***Response:** Sheet S-0.0 provides separate minimum design specifications for LVL beams and posts. IRC section R506.2.3. does not require vapor retarders at garage slabs per exception #1.



- *Comment 2: There is conflicting information in the general notes on Sheet A1 and the Structural Notes on Sheet S-0.0. It is preferred that complete structural information be in the structural notes; however, at a minimum, conflicts must be resolved. If structural information is retained on Sheet A1, the engineer of record must verify adequacy.*
 - a. *3,000 psi concrete is required for strength. The notes on Sheet A1 must be updated or removed.*
 - b. *Grade 60 reinforcing is required by design. The notes on Sheet A1 must be updated or removed.*
 - c. *Rough carpentry notes on Sheet A1 do not coordinate with some notes on Sheet S-0.0; however, Sheet S-0.0 does not address all members. Please coordinate and verify that all members are addressed and clear.*

Response: The structural notes on S-0.0 shall govern the structural member requirements. The conflicting information on Sheet A1 shall be removed or coordinated with S-0.0.

- *Comment 3: Provide a statement of special inspection as required in IBC 1704.3. Special inspection will be required for concrete (IBC 1705.3) and structural wood (IBC 1705.11.1).*

Response: Per chapter 17 of the 2015 IBC, concrete special inspections are required for the basement walls and footings, as well as for shearwalls with 3" on center edge nailing specified.

- *Comment 4: In order to complete the Mercer Island Cover Sheet, please indicate the name of the special inspection agency you are using. If unknown, we can indicate "to be determined" for later completion.*

Response: It is the responsibility of the owner or design professional in responsible charge to contract the special inspection agency as required.

- *Comment 5: The structural observation section of the Mercer Island Cover Sheet was filled out. Was it your intent to provide structural observation?*

Response: Per section 1704.6 of the IBC structural observations are not required for this home.

- *Comment 6: Fasteners for pressure-treated wood should be called out on the drawings as ZMAX hot-dipped galvanized (G185), stainless steel, or meet ASTM A 153 or A 653 standards or as otherwise specified in IBC 2304.10.5.1. The notes on Sheet S-0.0 are not complete.*

Response: Per the foundation general notes on S-0.0, "BUILDER TO VERIFY CORROSION-RESISTANCE COMPATIBILITY OF HARDWARE & FASTENERS IN CONTACT w/ PRESERVATIVE-TREATED WOOD. CONTACT LUMNER & HARDWARE SUPPLIERS TO COORDINATE". Therefore, no further notation is required.

- *Comment 7: Retaining wall sequence of construction should be noted on the plans. Please note that slab-on-grade will be placed prior to backfill and that walls will be backfilled prior to placement of the floor at the top of the wall. For example, refer to Details 10, 11, & 12/SD-01 and 14/SD.02.*

Response: Please see the updated plans for the added specification for the sequencing of backfill.

- *Comment 8: Detail 13/DS-01 is cut on Sheet A2.2 at the retaining wall; however, this detail is on Sheet SD.02.*

Response: Please see the updated plans for detail 16 on sheet SD.02 cut at the retaining walls.

- *Comment 9: Seismic lateral earth pressures must be considered at retaining walls supporting more than 6' of backfill due to design earthquake ground motions per IBC 1803.5.12.1. Provide supporting calculations justifying wall designs considering a seismic lateral earth pressure.*

Response: Please see the updated wall designs per the recommendations of the PanGeo Soils report dated 4/28/2016.

- *Comment 10: Detail 17/SD-02 is cut at the window wells, Sheet A2.0. This does not appear to be an adequate detail as there would likely be an offset of more than 4'; refer to the Site Plan, Sheet A1.1.*

Response: Please see the updated detail 17/SD-02 and calculations for the wall supporting up to 6' of unbalanced fill designed to span side to side to the adjacent wall returns.



- *Comment 11: We do not find the combination symbol for GLBs specified in the Structural Notes. Typically, simple span beams are 24F-V4 and cantilevered and continuous spans are 24F-V8. For Beam B8 at the garage, for example, page 16 of the calculations shows the simple-span beam will require a 24F-V8 GLB. Please specify this clearly on the drawings.*

Response: Please see the updated plans for 24F-V8 GLB's specified on sheet S-0.0.

- *Comment 12: Because the foundation is minimally sized and reinforced, justification will need to be provided at some point load conditions.*
 - a. The garage door headers (Beam B4 & B8) are supported at the continuous footing per Detail 5/SD-01. Evaluate support at central post.*
 - b. Evaluate the point load at the 24" square footing that supports B15 at the foundation at the northeast corner of Bedroom 5.*

Response: Please see the updated plans for an added pad footing below the posts at the pier between the garages. The reaction from B15 is 6.24 kips, with the updated 3000 psf soil bearing per the PanGeo soils report, the 24" square footing is adequate to support 12 kips of load. Therefore, no further changes are required.

- *Comment 13: Detail 80/LB-2 is cut at the east wall of the Covered Patio, Sheet A2.2. The detail shows support by a flush beam, but the plan calls for a girder truss. Revise the detail to reflect the actual condition.*

Response: Please see the updated plans for clarification of the supporting framing member.

- *Comment 14: Page 23 of the calculations shows the wind design parameters and the tributary design areas, but we are not finding a clear evaluation of the wind pressure. Please clarify so that we can verify the forces distributed to each reaction line.*

Response: The wind pressures have been determined per chapter 26 and 27 (directional procedure) of ASCE 7-10.

- *Comment 15: Redundancy must be evaluated per ASCE 12.3.4.2. There are basically two options; use $\rho = 1.3$ or justify that $\rho = 1.0$ is appropriate. Typically, if removal of a shear wall with an aspect ratio of greater than 1.0 would not result in more than a 33 percent reduction in story strength, ρ can be 1.0. Provide supporting calculations to justify.*

Response: Shearwall #201 and #204 are the only shearwalls with an aspect ratio greater than 1.0 and consequently qualify for the additional requirements of Table 12.3-3 of ASCE 7-10. Shearwall #201 resists the greater seismic load of 0.7k out of the two walls. The removal of this wall would result in about an 11% (0.7k/6.4k) reduction in the story strength, less than the 33% limitation set per ASCE 7-10. Therefore, the ρ of 1.0 used in design is appropriate.

- *Comment 16: SDPWS 4.1.7 indicates that toenailed connections cannot be used to transfer seismic lateral forces greater than 150 plf (ASD). Provide a shear flow connector in Detail 2/LB-1 to transfer shears across the splice in the wall sheathing.*

Response: The worst-case seismic unit load within a shearwall at a gable end condition in the design provided occurs at shearwall #206. The unit shear within this wall is 103 plf and can be transferred by the toenailed connection per detail 2/LB-1. Therefore, no additional connectors are required.

- *Comment 17: Detail 99/LB-2 is cut at the roof over shear walls 206 & 207. This detail shows a clip from the truss bottom chord to top plate and refers to Detail 2/LB-1 for more information. We do not find clarifying information in Detail 2.*

Response: Please see the updated plans for the clip shown at detail 99 removed. The lateral connection and gable end bracing per detail 2/LB-1 shall apply to detail 99/LB-2.

- *Comment 18: Both options in Detail 1/LB-1 and Detail 1A/LB-1 only transfer limited shear to the shear wall top plate through the SDWC screws. Provide a shear flow connector to transfer shears from the truss blocking to top plate.*

Response: The SDWC screws in combination with the toenails provided from the truss to the double top plate have adequate capacity to transfer the loads required by design. The SDWC screw has 57.5 plf (115 #/screw) of shear transfer capacity plus 163 plf (326 # for three toenails per truss) for a total of 220 plf of load transfer. This exceeds the diaphragm capacity of roof sheathing, and therefore does not control the connection design.



- *Comment 19: Detail 47/LB-1 is cut above shear wall 205 which shows a drag truss above the shear wall with A35 clips to the top plate. In plan we find the design capacity for the drag truss, but the drag truss does not appear to be aligned over the wall. Provide a clarifying detail to reflect the actual condition. Additionally, Note 4 is referenced at this location which calls for sheathing to be fastened; what is this note intending to mean? Is the note referring to the wall sheathing or truss sheathing? Clarify intent.*

Response: An additional roof drag truss shall be provided above the sheareall below to follow the specification of detail 47/LB-1. Note 4 is referring to the sheathing specifications of the interior wall, SW #205, not the truss. Please see the revised plans for clarification.

- *Comment 20: Page 32 of the calculations shows the evaluation of shear wall 103. The Main Floor Plan, Sheet A3, shows two wall segments along this line. An interior wall at the Garage that is 14' long and an exterior wall at the Pantry that is 7.5' long. The calculations appear to assume a 30' wall length along this line. Please reevaluate.*

Response: The detailing provided on plan, 95/LB-2, connects the shearwalls at the interior and exterior of the garage. Please see the revised plans for the #103 callout to extend the full 33' per the design.

- *Comment 21: In Detail 4/LB-1, either show wall diaphragm nailing into the top plate of the truss blocking or the truss blocking will need to be designed to transfer shear forces as a drag member. Clarify intent.*

Response: Detail 4/LB-1 specifies shear wall nailing into the ladder truss top and bottom chord. The blocking provided is for out of plane bracing of the top of the lower wall, and additional nailing from the floor sheathing is provided to the full depth blocking.

- *Comment 22: Shear wall 102 is a double-sided shear wall with special detailing requirements for force-transfer around openings; please address the following:*

- a. The entire 20' length of shear wall is sheathed both sides. Please clarify the notes on Sheet A3 to clearly specify this.*
- b. This force-transfer shear wall has very narrow wall panels. Per SDPWS 4.3.5.2, Item 1, the length of each wall pier shall not be less than 2 feet.*
- c. Straps around openings per Detail 94/LB-2 must be provided around the two windows and the fireplace opening. Sheet A4 is not clearly communicating this. Please reference Detail 94 at all three locations or provide an elevation view of this wall.*
- d. Page 32 of the calculations assumes a wall length of 8' for shear resistance. Please verify; we find only 7' of shear wall length at this critical reaction line.*
- e. The holdown at the southwest corner of the Great Room is shown on Sheet A3 as an HD-7 strap to the framing below. At the level below, the Main Floor Framing Plan, Sheet A2.2, shows the HD-7 from above and HD-10 at the base of wall to foundation. 1) the call-out on Sheet A2.2 is slighting south of the wall above; please align the holdown with the end of the shear wall above, 2) HD-10 is not defined on Sheet S-0.0.*
- f. Where panels are applied to both faces of a shear wall and nail spacing is less than 6" on center on either side, panel joints must be offset to fall on different framing members. Alternatively, the width of the nailed face of the framing members can be 3x or greater at adjoining panel edges and nails at all panel edges staggered. Refer to SDPWS Table 4.3A, footnote 6. Provide appropriate notes to address this requirement at this shear wall since you do not have this specified in a shear wall schedule.*

Response: Please see the updated plans for corrections for items, a, c, e, and f. As discussed the 2' panel minimum is an arbitrary code requirement, and research by the APA as well as shear wall testing completed by M+K in partnership with Villanova University has proven that the aspect ratio is a pertinent measure of the minimum panels, not the 2' per the NDS. Therefore, it is our professional opinion that the 1'-8.75" panels used in this design, meeting the 3.5:1 aspect ratio per the NDS, are adequate. It has been verified that there is 8' of qualifying panel, (2)1'-8.75" panels at the ends of the wall, and (2)2'-4" panels at the edges of the fireplace.

- *Comment 23: Where the required nominal unit shear capacity, vs, exceeds 700 plf or nail spacing of 2" or less is specified, 3x framing members and blocking must be provided at adjoining panel edges and nails must be staggered per SDPWS 4.3.7.1, Item 5. Alternatively, (2)2x's can be used where they are fastened together with fasteners designed to transfer the induced shear between members. Provide appropriate notes to address this requirement at applicable walls. Refer to shear walls 102, 105, 106, & 107.*

Response: Please see the updated plans for the added 3" nominal framing member at all panel edges.



- *Comment 24: Shear wall 107 has a total length of 36' with 10.8' for shear resistance in this force-transfer shear wall (see page 34 of the calculations). We do not find any details that show straps around openings; see Sheet A4. Detail 43/LB-2 is noted typically on that wall, but that detail does not exist. Please detail this condition particularly across the three large kitchen windows.*
Response: Detail 93/LB-2 was intended at each opening, which provides force transfer straps for the large kitchen windows. Please see the updated plans for detail 93 specified.

- *Comment 25: Detail 12/LB-1 is cut on Sheet A2.2 above shear wall 003 to the east of Bedroom 6 in the basement. This wall collects shears through the floor diaphragm and transfers them to the furring wall below. Detail 12 notes the drag force at the floor truss is per plan, but we do not find this called out in plan, Sheet A2.2.*
Response: Please see the update plans for the offset drag truss and drag load noted.

- *Comment 26: Sheet A2.1 refers to Note 19 at shear wall 001 located between the Rec. Room and stair. There is no Note 19. Please clarify.*
Response: The plans should reference note 9 for the 3" on center edge nailing shearwall. Please see the updated plans for the note correction.

- *Comment 27: Sheet A2.1 refers to Note 10 at the north end of shear wall 001 to address the connection to the perpendicular concrete wall for uplift resistance. Provide a specific detail at this connection since the sheathing at shear wall 001 will need to extend through the perpendicular furring wall to the concrete wall.*
Response: Please see the updated plans for this condition clarified, and a detail provided.

- *Comment 28: Note 12 is referenced on Sheet A2.2 at the drag truss. Is this the correct note? The note references an OSB rim, but the detail utilizes a drag truss, not a rim member.*
Response: Please see the updated plans for the sheathing nailing to the drag truss specified on plan, and the reference to note 12 removed.

Please feel free to call if you have any questions.

Respectfully,

MULHERN & KULP STRUCTURAL ENGINEERING, INC.

Richard J. Zabel, P.E.

Project Engineer

Nicholas J. Martignetti, P.E.

Associate Owner + San Diego Office Director



Signature, Seal & Date