



**Swenson Say Fagét**  
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## **Redmond Senior Center**

8703 160<sup>th</sup> Ave NE  
Redmond, WA 98052

## **Building Investigation**

August 29, 2019

Prepared by: Zane Kanyer PE, SE

For: City of Redmond  
c/o Eric Dawson  
15670 NE 85<sup>th</sup> St  
Redmond, WA 98052

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## Purpose and Scope

At the request of the City of Redmond, this report presents the results of our limited investigations of portions of the Redmond Senior Center, located at 8703 160<sup>th</sup> Avenue Northeast in Redmond, Washington. Our services were performed in general accordance with our proposal for structural services, dated August 14<sup>th</sup>, 2019. Swenson Say Fagét performed this work in association with the City of Redmond after a stucco panel fell from the existing structure. Further investigation by the City of Redmond was commenced shortly thereafter at which time SSF was enlisted to provide services. This report summarizes our findings and recommendations regarding the repair of the deteriorated structure. Our scope of work includes the following:

1. Review available documents.
2. Perform site visit to observe existing structural condition and note areas of structural damage.
3. Prepare a report that outlines our findings and recommendations.

## Documents Available for Review

The City of Redmond provided us with the following documents to assist in our evaluation:

1. Redmond Municipal Campus, Redmond Senior Center by Arai/Jackson Architects & Planners dated January 5<sup>th</sup>, 1989.
2. Wall Condition Map received August 15<sup>th</sup>, 2019 authored by the City of Redmond.
3. Summary of Wall Conditions received August 15<sup>th</sup>, 2019 authored by the City of Redmond.
4. Photo summary of the investigations performed by the City of Redmond.

## Building Description

Built in 1989, the Redmond Senior Center is a single story wood framed structure. The roof framing typically consists of ½" plywood sheathing over 2x12 rafters supported by glulam girders at regular spacing. In some areas, the ½" sheathing is placed over 3x T&G decking which is also supported by glulam girders. The roof steps in elevation over the building footprint at a number of locations. The existing drawings indicate the lateral system consists of plywood sheathed shearwalls, however observations in the field indicated OSB was substituted for the CDX plywood originally called out on the drawings. The foundations are conventional, with continuous concrete stem walls and footings underneath bearing walls and isolated pad footings under columns.

## Initial Investigation

At the client's request, Swenson Say Faget (SSF) performed an initial site visit on August 15<sup>th</sup>, 2019 to observe the damage to the exterior walls uncovered by the City of Redmond during previous intrusive investigations. During the site visit we observed significant damage to the exterior wall sheathing and in some instances the wood studs. In total, at the time of our arrival, (17) roughly 24 inch square openings were cut in the exterior finishes to observe the sheathing and wall framing. Appendix A contains a site map of the locations the openings were performed as well as a summary of the findings at each opening. These were both provided by the City of Redmond, however based on our observations, we concur with the summary.



Based on our observations, it is likely that the structural damage to the exterior walls is extensive and impacts both the lateral and gravity systems and would be considered substantial structural damage as defined by the 2015 International Building Code (IEBC). The IEBC defines substantial structural damage as:

1. The vertical elements of the lateral force-resisting system have suffered damage such that the lateral load carrying capacity of any story in any horizontal direction has been reduced by more than 33 percent from its pre-damage condition.
2. The capacity of any vertical component carrying gravity load, or any group of such components, that supports more than 30 percent of the total areas of the structures floor(s) and roof(s) has been reduced more than 20 percent from its pre-damage condition and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and locations.

In the case of the Redmond Senior Center, item 1 outlined above would be most applicable. As such, section 404 of the IEBC requires the building be laterally evaluated with full code level wind loads and 75 percent code level seismic loads. We evaluated the existing lateral load carrying system using the above values and assuming all exterior walls were damaged. This analysis determined that significant deficiencies in the lateral system are present (See Appendix B).

## Recommendations

As noted in the previous sections, significant damage has been observed in the structural framing for the Redmond Senior Center. The damage impacts both the load carrying capacity and the serviceability of the structure.

The observed extent of structural damage is currently limited to the exterior walls of the building. However this does not guarantee damage is not present in other locations of the building. It was discussed on site that there were previous leaks in the roof membrane that required repair of the roof assembly to mitigate ongoing water intrusion issues.

Based on the items listed above, we our recommendations are as follows:

1. Vacate the property until repairs can be completed.
2. Begin a process of removing all exterior finishes to determine extent of damage and begin to outline overall repair scope with the intent of repairing the structure in kind.
3. Enlist the services of an envelope consultant to provide updated details to mitigate future water intrusion.
4. Identify select portions of the existing roof structure for intrusive observations to determine if the water damage extends to the roof system as well.

We understand the City of Redmond may consider a new building in lieu of repairing the existing Senior Center. As such we recommend enlisting the services of a contractor with experience with similar projects to better outline an expected repair cost to help facilitate the City's cost benefit analysis.

SSF is happy to provide continued design services as requested to help facilitate the City's analysis.



## Limitations

This study and report represent our opinions based solely on our review of existing drawings provided by the City of Redmond and observations from our site visits.

This report is intended for the sole use of the building owners and its consultants. The scope of work performed for this evaluation may not be appropriate to satisfy the needs of other users, and any use or re-use of this document and the findings and recommendations presented herein is at the sole risk of the said user. Furthermore, this evaluation does not represent a warranty or guarantee on our part that other problems do not exist. Swenson Say Fagét's professional services are performed using the degree of care and skill ordinarily exercised under similar circumstances by reputable structural engineers practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional opinions included in this report.

Best,



Zane Kanyer, PE, SE

Associate Principal

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## Appendix A

### Site Map & Summary of Findings



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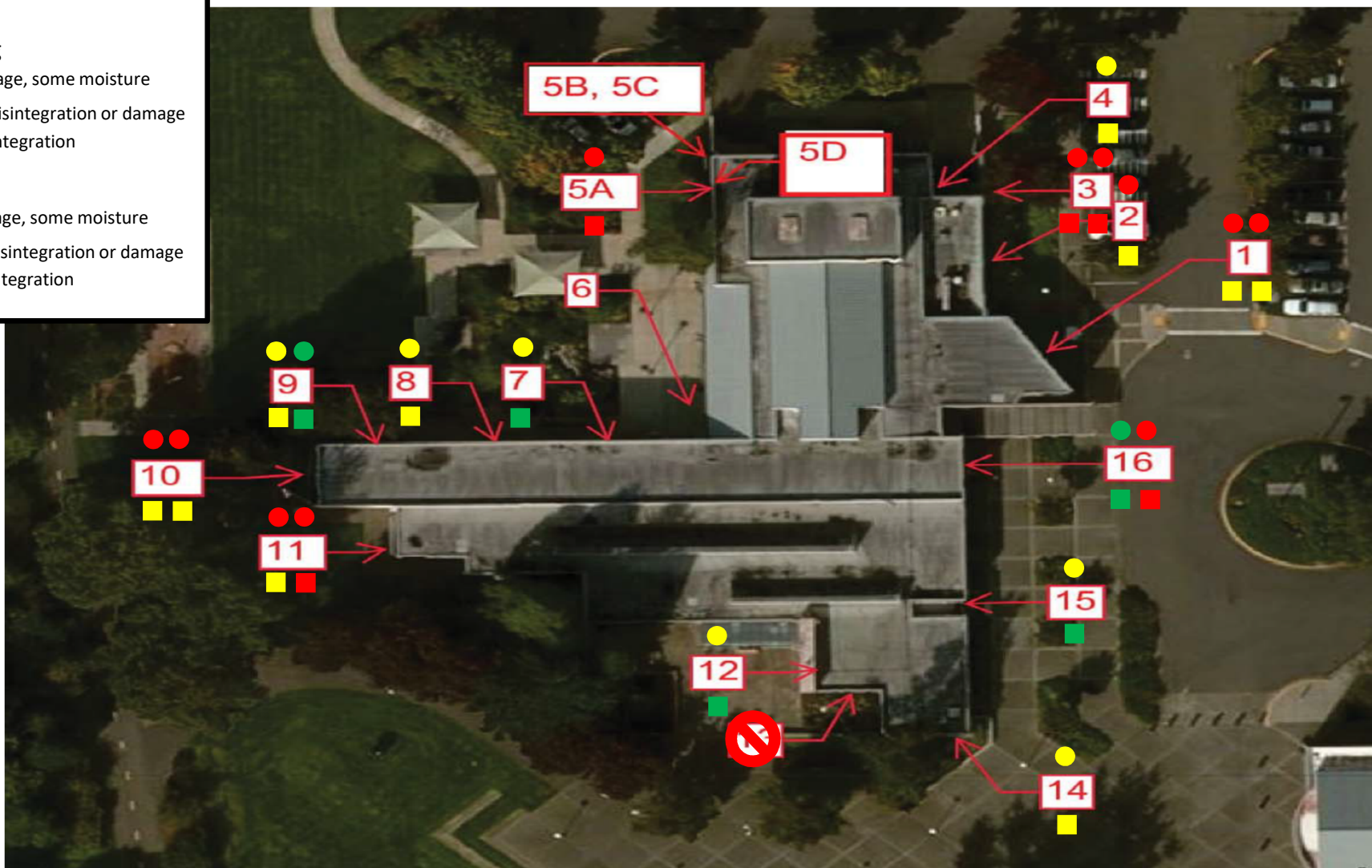
### Key

#### Sheathing

- No damage, some moisture
- Partial disintegration or damage
- Full disintegration

#### Framing

- No damage, some moisture
- Partial disintegration or damage
- Full disintegration



## Senior Center Investigation Summary

Site No.	Plywood Sheathing Rating*	Plywood comments	Framing Stud Rating*	Framing comments	General Comments
1a	0	Disintegrated	1	Some rot	
1b	0	Disintegrated	1	Some rot	Added an extra hole at this site
2	0	Disintegrated	1	Some rot	
3a	0	Disintegrated	0	Extreme rotting of studs	
3b	0	Disintegrated	0	Extreme rotting of studs	
4	1	Half of plywood disintegrated	1	Some rot	
5	LOCATION 5 IS FOR REPAIR OF PANEL FAILURES				
6	0	Disintegrated	0	Extreme rotting of studs	
7	1	Rotten	3	Studs OK	
8	1	Rotten	2	Some rot	
9a	3	Clear and dry	3	Clear and dry	lower location beneath window
9b	1	Half of plywood disintegrated	2	Some rot	
10a	0	Disintegrated	2	Studs wet	Upper hole added at this site
10b	0	Disintegrated	2	Studs and plate wet	
11a	0	Disintegrated	2	Studs wet	location near door
11b	0	Disintegrated	0	Extreme rotting of studs	location move to tiled column
12	2	Some Rot	3	Studs OK	only 1 of 3 locations opened up
13	LOCATION 13 NOT DONE				
14	1	Rotten	1	Some rot	lower location not done
15	1	Rotten	3	Studs OK	
16	3	Clear and dry	3	Studs OK	
17	0	Disintegrated	0	Extreme rotting of studs	this location added between 15 and 16

\* plywood and framing ratings

0 = severe damage

1 = significant damage

2 = wood is wet, but no significant damage

3 = clear and dry



## **Appendix B**

Areas of overstress

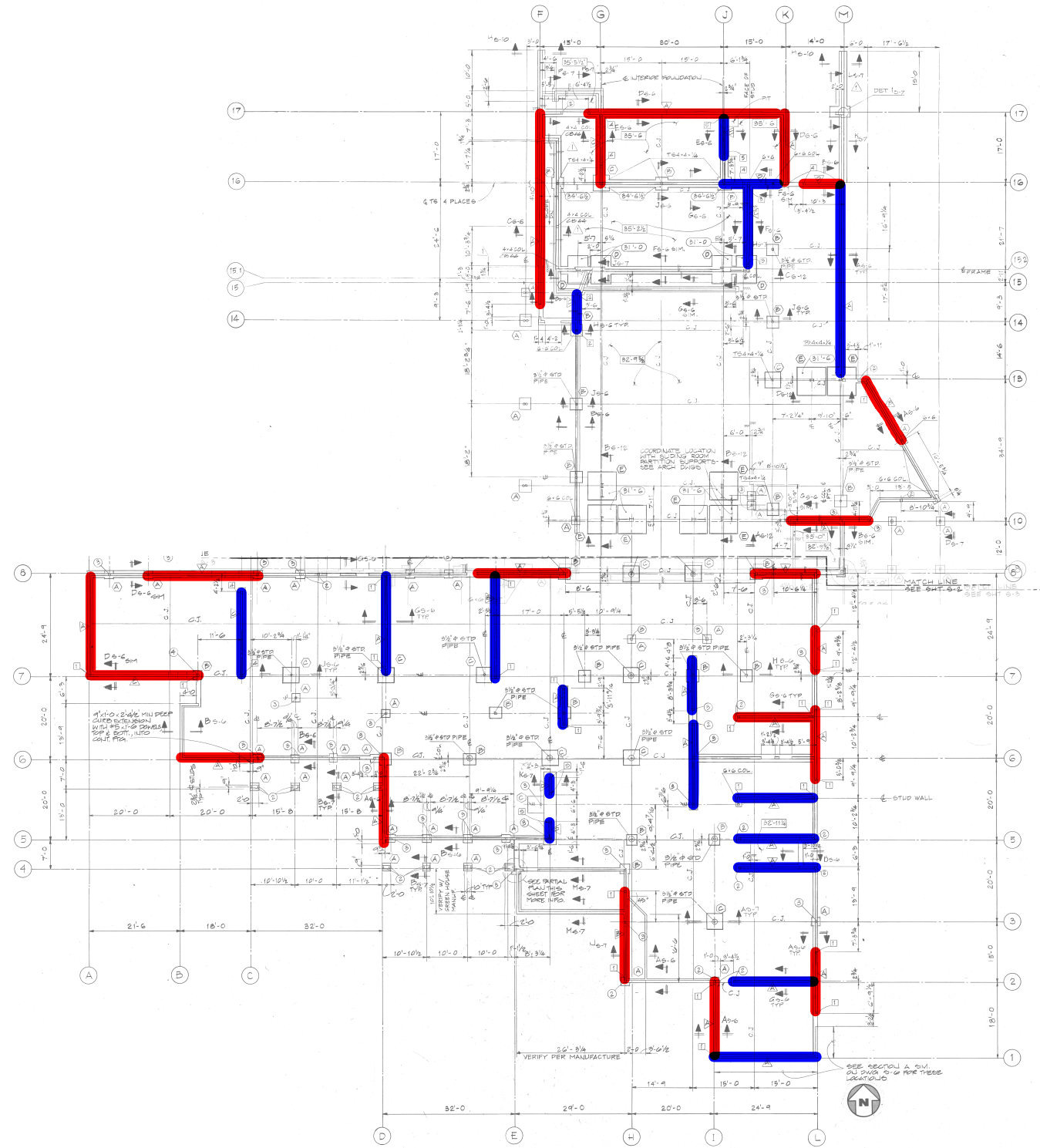


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## Appendix C

Select Photos



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**Figure 1 - Typical opening showing signs of significant deterioration of OSB sheathing.**





**Figure 2 - Significant OSB sheathing deterioration.**



**Figure 3 - Sample of significant deterioration in wood stud wall framing.**