Vu Villa Staircase Structural Repair

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Recommended Citation  
Bingham, Kevin; Lindbloom, Tyler; Sukut, Kaden; Laws, Tanner; Baszler, Cody; Steele, Alec; Brewer, Eli; Sukut, Kolby; and Bruner, Derek, "Vu Villa Staircase Structural Repair" (2020). TECHxpo. 9.  
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Vu Villa Staircase Structural Repair

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Advisor: Kolby Sukut

Background
The Vu Villa in uptown Butte has a staircase leading to the second floor that are beginning to sag and need structural support to fix the sag in the stairs.

Option 1—Beam
Using the LRFD method of wood design, the loading conditions were determined. Using the ultimate load, the beam size was determined, being a 3 1/2” x 11 7/8” 24F-V4 DF/DF Glulam Beam. The connections needed were designed using Simpson Strong-Tie connections. The connections being used are MBHU 3.56/11.88KT and CCQ74SDS2.5.

Beam Construction:
Material & Supplies = $432
Labor = $2,317
(18.75 hrs over two days)
Equipment = $4,741
Total Cost = $7,490

Option 2—Wall
2x6 Hem-Fir Used for Studs, Top Plate, Kickers, and Bottom Plate
16” O.C. stud spacing
16’ Height, 32’1” Length
Use 10d nails
All connection will be toenailed
Wall connects to Staircase Stringer

Wall Construction:
Material & Supplies = $3306.50
Labor = $6,168.14
(8 DAYS)
Equipment = $1,117.95
Total Cost = $13,876.16

Positive Aspects of Option 1:
Less invasive
Lower bid cost
Shorter construction duration

Positive Aspects of Option 2:
Creates New Storage Area
Improves Visual Appearance
Maximizes Floor Space Use