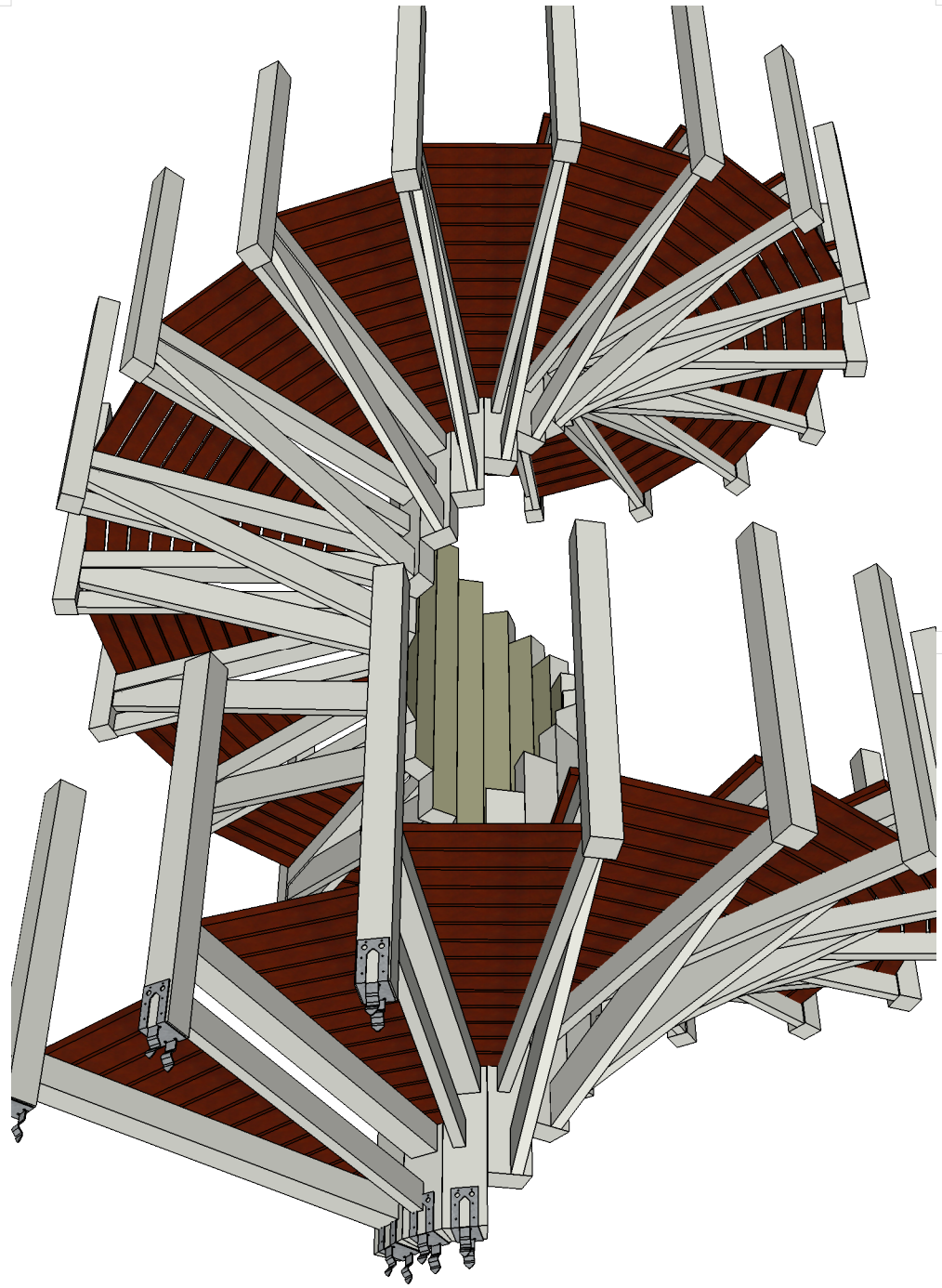
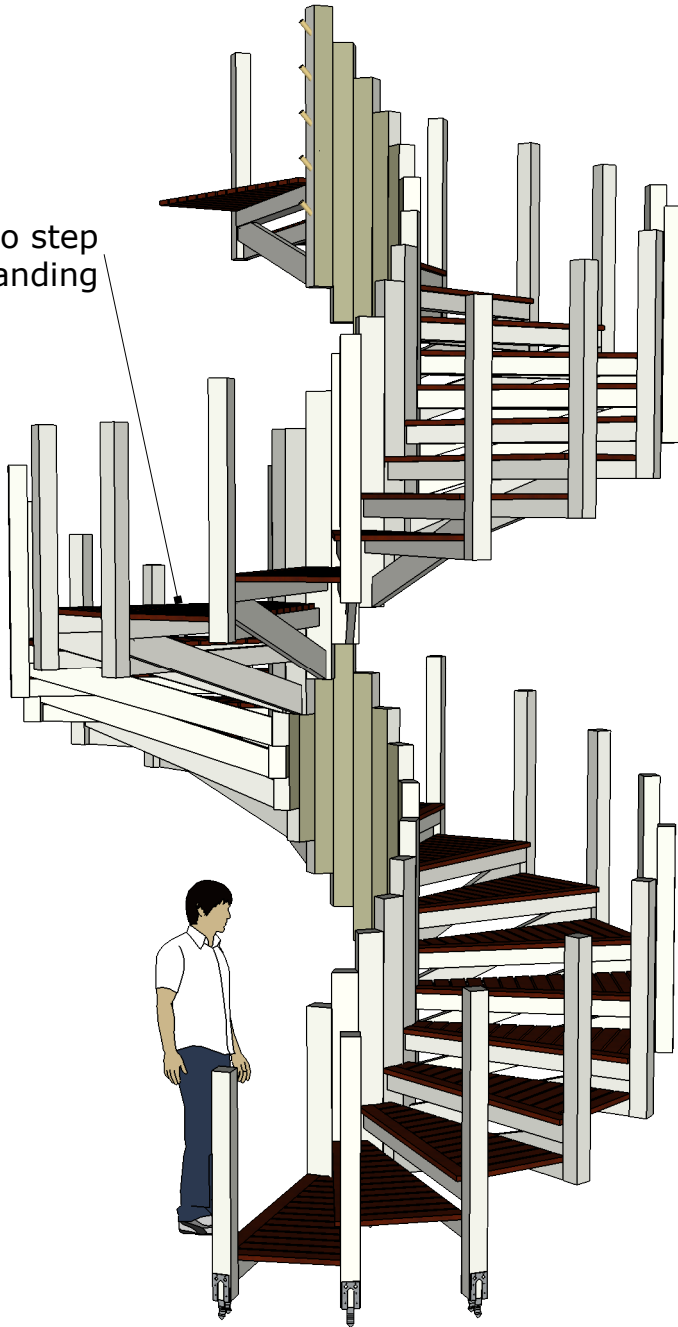


two step  
landing



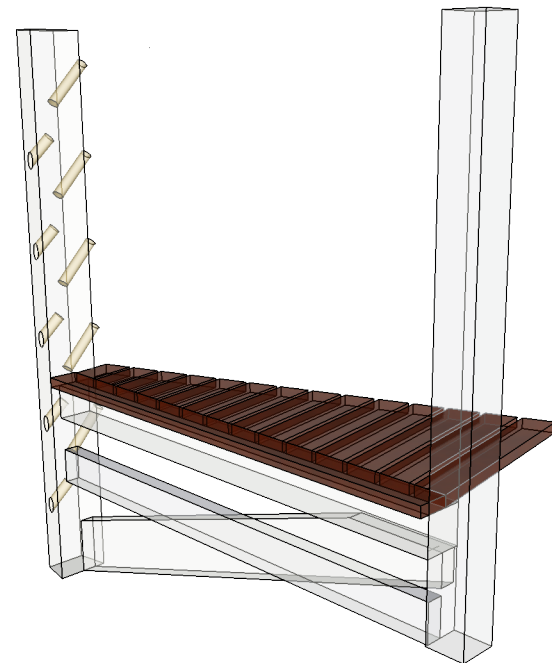
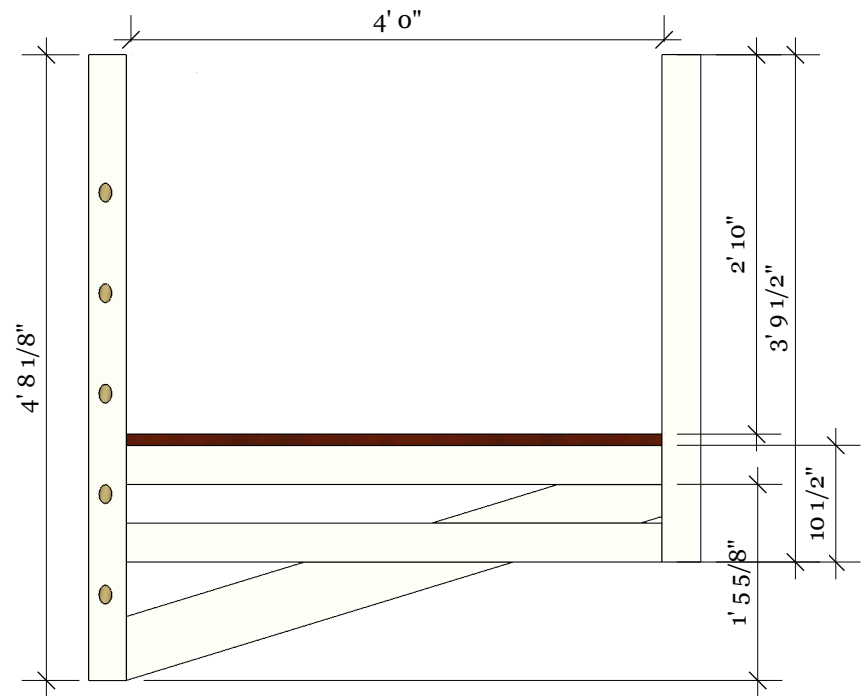
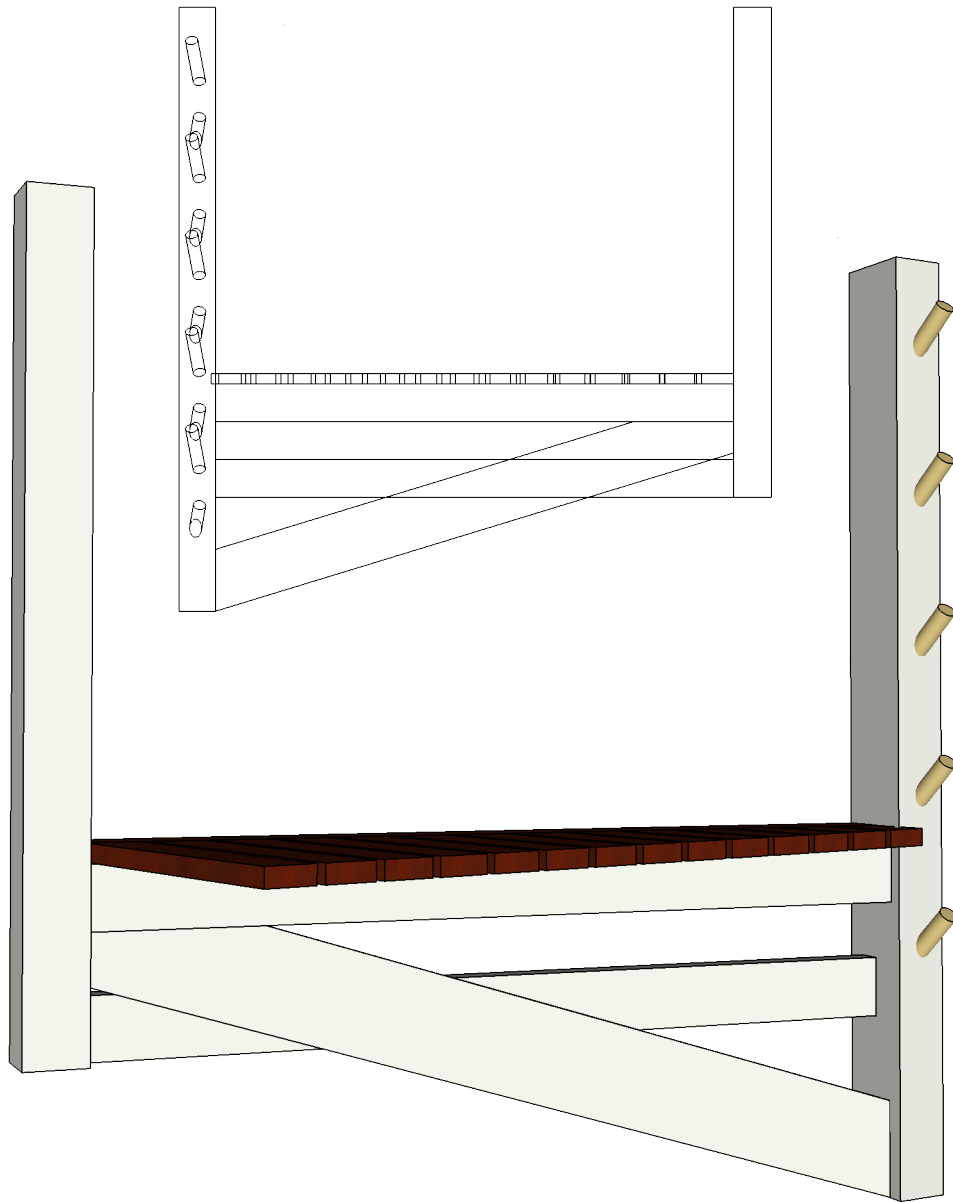
# Spiral Staircase Kit, 17'

Spiral Staircase Kit, self-supporting, exterior  
design study  
Wainiha, Kauai, Hawaii

Nov 6, 2010

by Joseph Oster  
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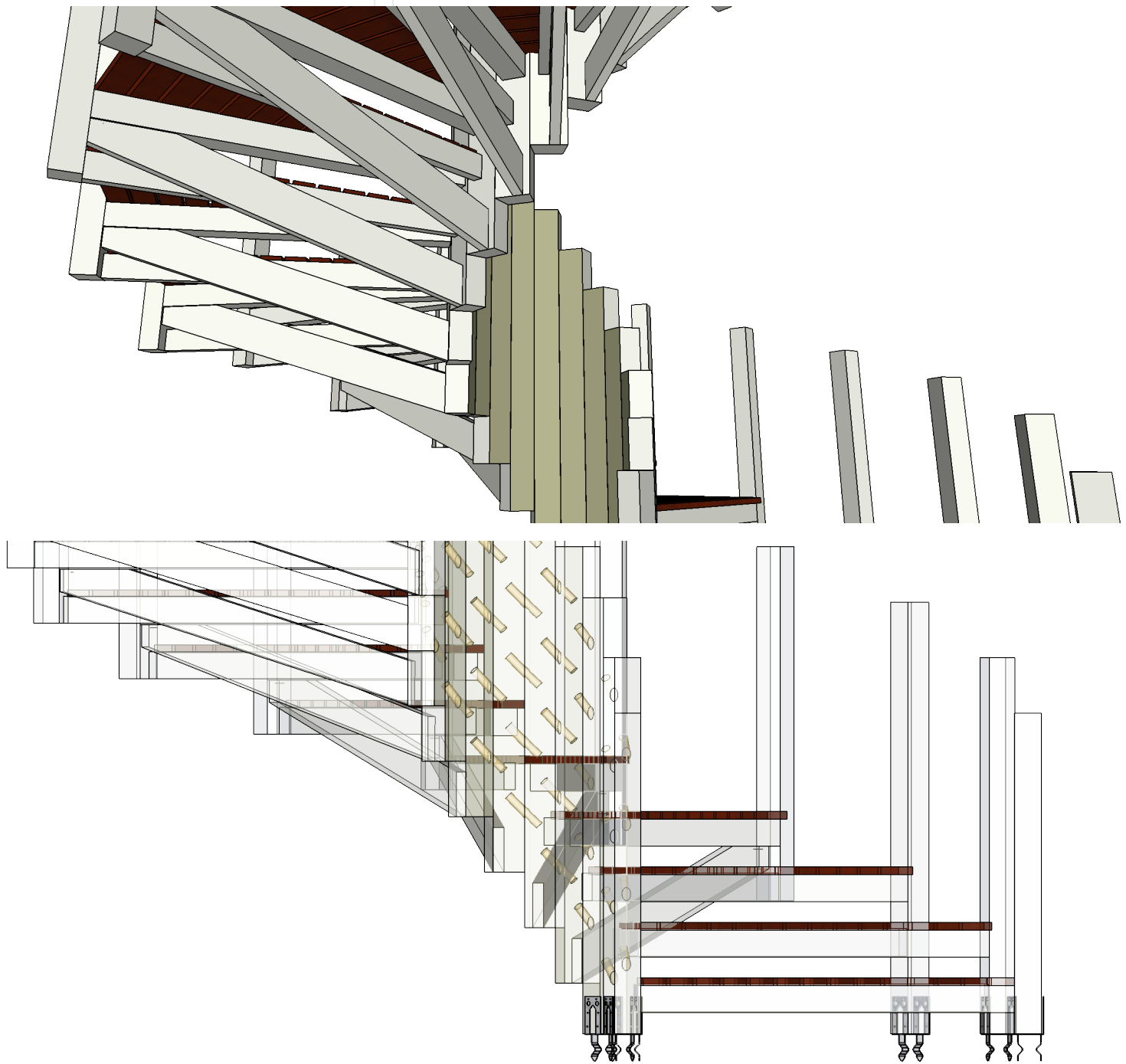
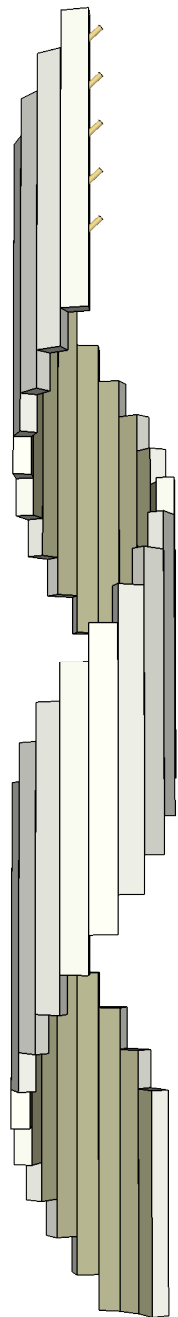
single stair

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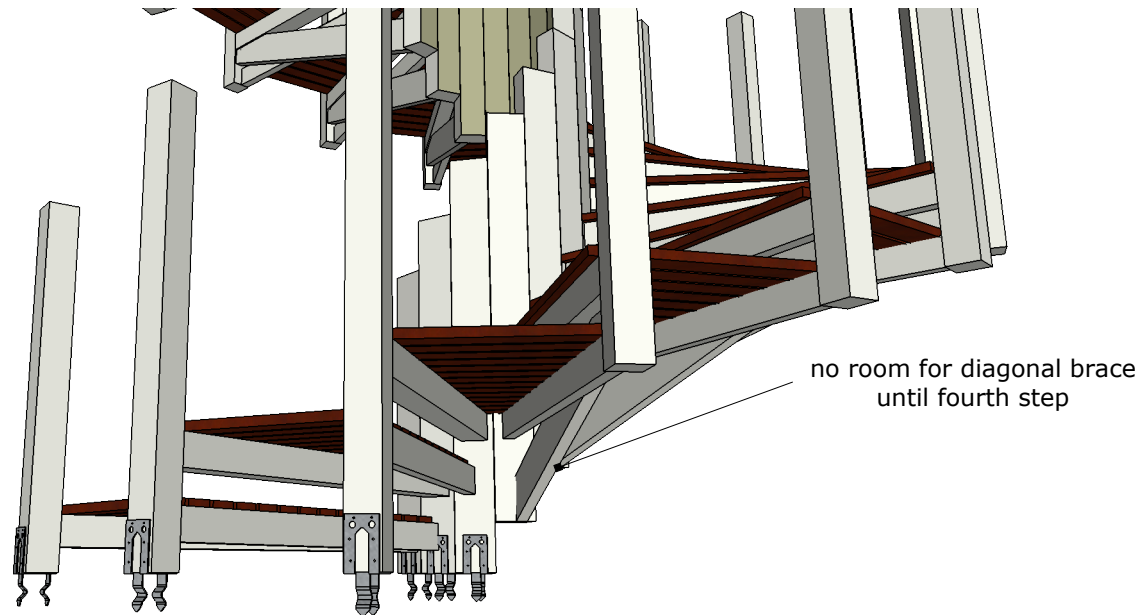
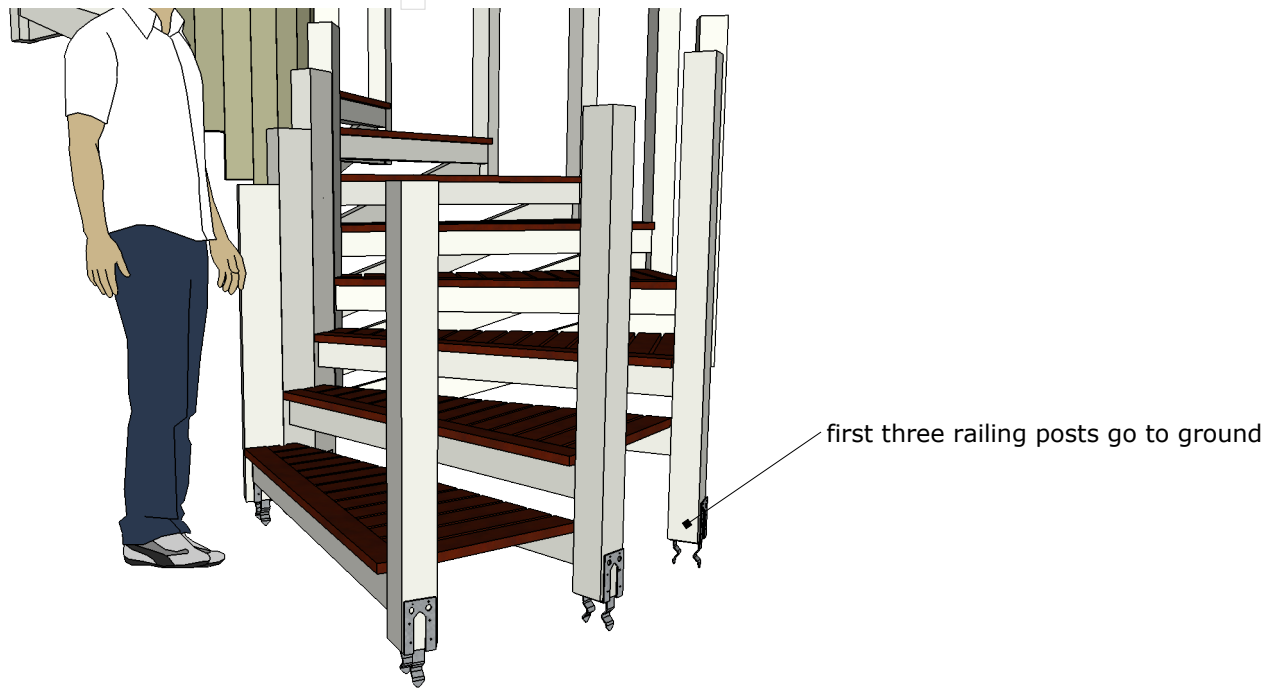


side views

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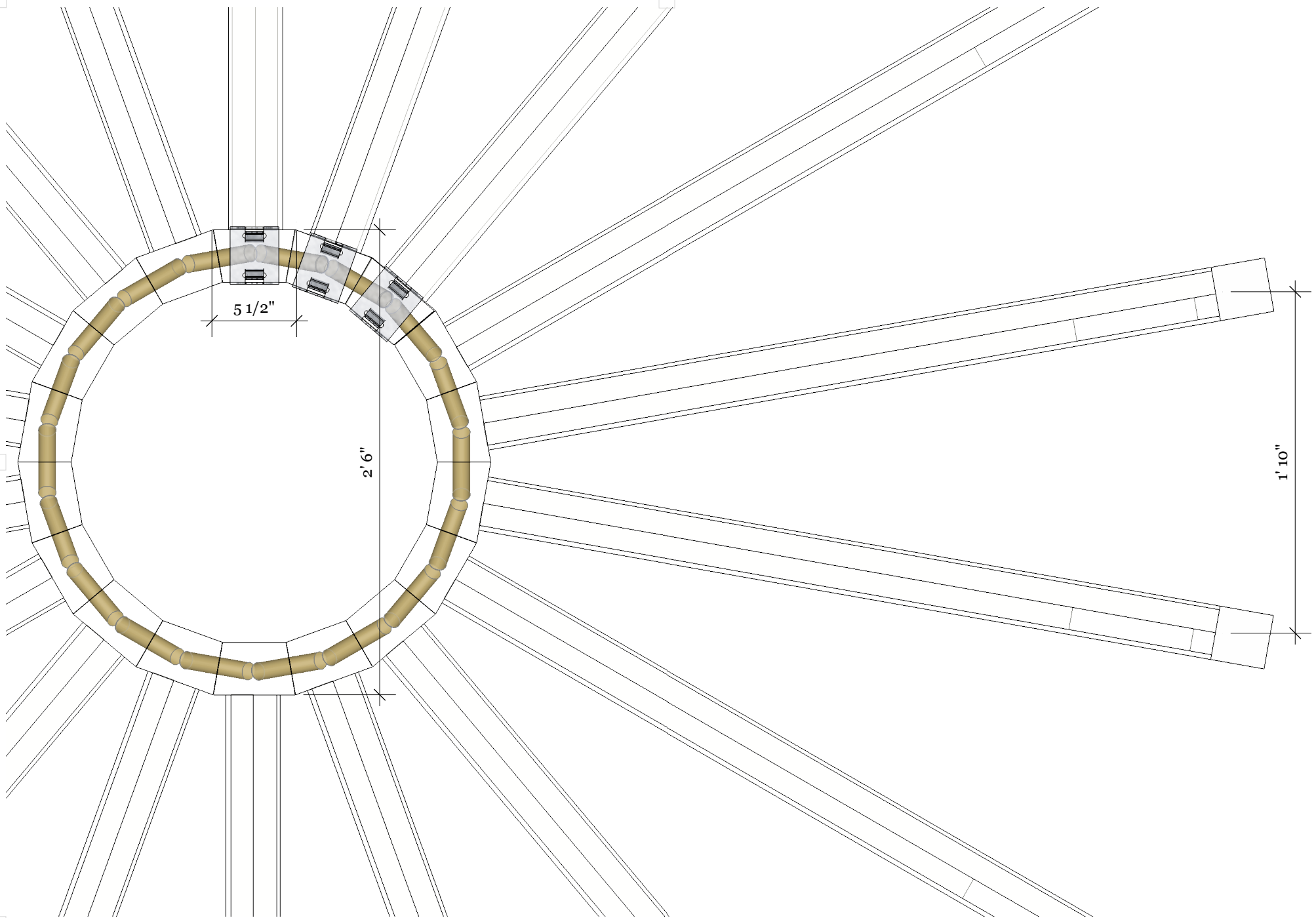
first three steps

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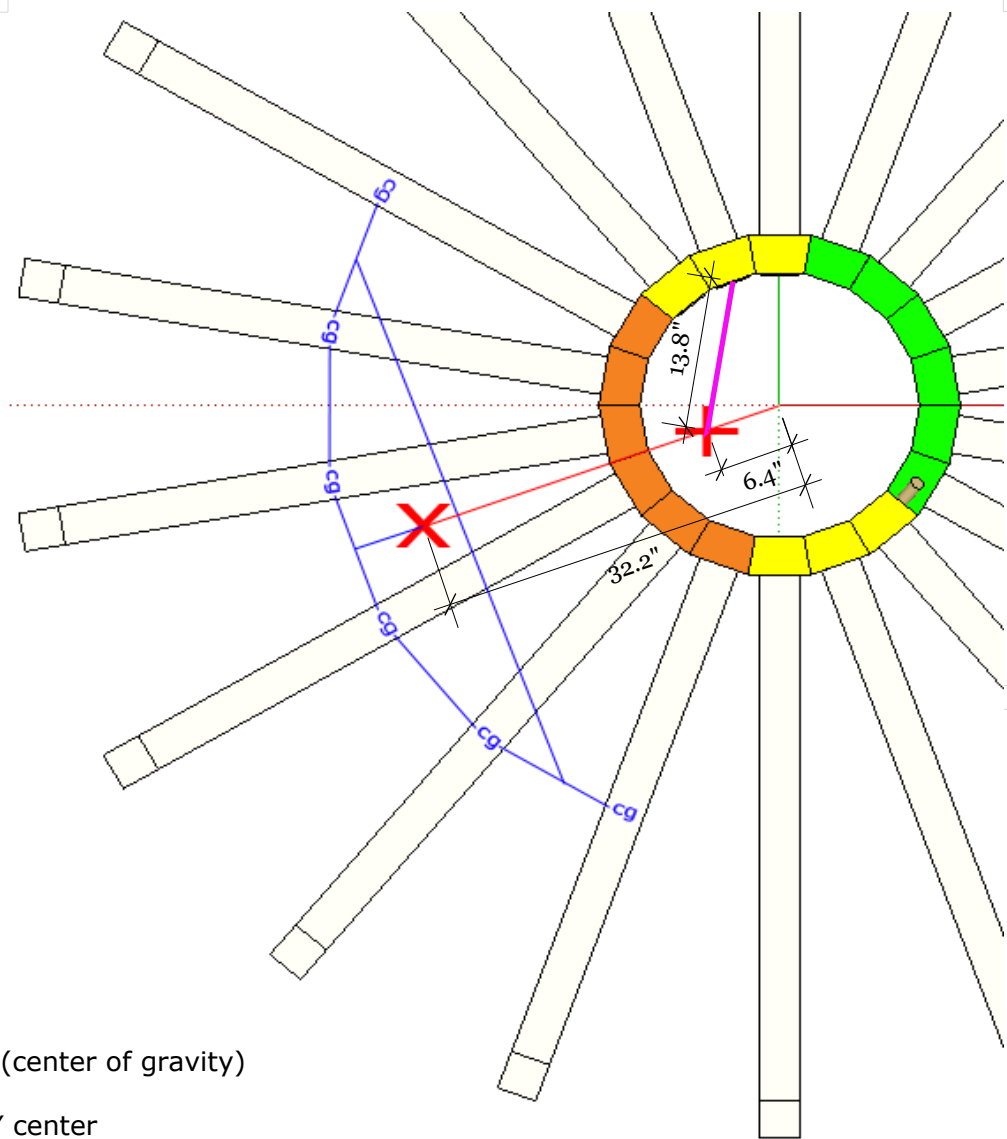
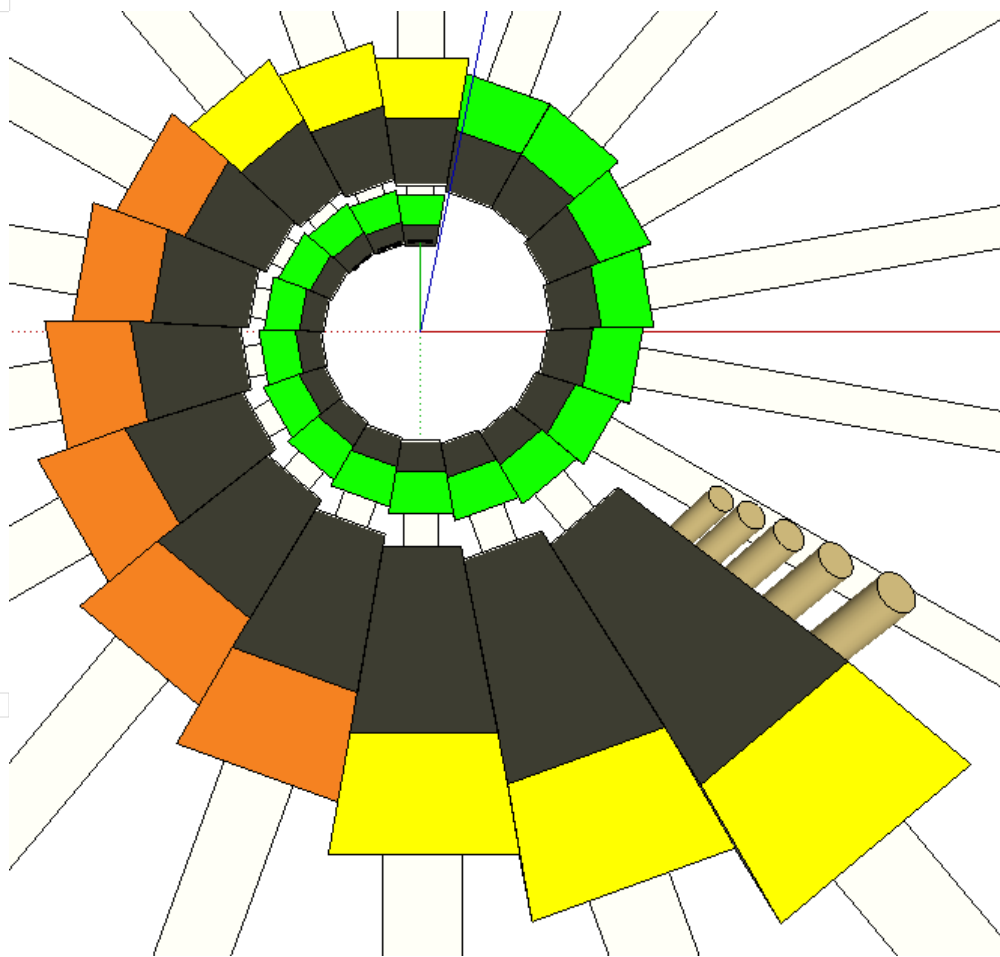


bottom

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### Analysis:

- Green colored steps indicate first circle of 18 steps whose CG (center of gravity) is located at the X/Y center
- Yellow steps balance each other, so their CG is also at the X/Y center
- 24 out of 30 steps total (4/5ths of total mass) has CG at X/Y center (origin)
- Orange steps, six out of 30 steps (1/5th of total mass), have no matching opposite section, so their CG is calculated at "X"
- Combined CG "+" is located 1/5th the distance from X/Y center to "X" (6.4")
- **Purple line** indicates direction of tipping force; magnitude will be 1.15 times total weight of steps, in ft./lbs. (13.8"/12")
- Divide that force by 17', using the full height as a lever, to determine the tipping load at the top (in ft./lbs.)

tipping force, top view

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