



December 13, 2019

Summit Homes
120 SE 30th St
Lees Summit, MO 64082

**RE: Foundation Modification for Lot # 21 Creekside at Raintree – 4413 SW Nautilus Pl
Lees Summit, MO 64082 – Permit # PRRES20193476**

A subgrade inspection was performed by Residential Engineering Services, LLC (R.E.S.) at the above referenced property. The purpose of this inspection was to determine structural adequacy of the existing subgrade soil at proposed footing elevations for construction of concrete foundation.

RES has determined that the subgrade material at proposed footing elevations does not have sufficient bearing capacity to properly support foundations for the structure specified in the approved permit plans. RES recommends that the following modifications be made to the foundation plan:

- Drill 18" diameter concrete piers per the attached layout.
- Piers shall be drilled to competent original limestone, sandstone, or shale.
- The piers shall be reinforced with (4) #4 bars for the depth of the pier.
- Lapping shall be no less than 24".
- (4) #4 bars shall extend a minimum of 24" into the footings.
- All piers shall be inspected by our firm prior to the placement of concrete.

Upon approval and completion of the piers, the foundation footings, walls, and slabs shall be placed over the piers. If the city approved plans do not exceed the following minimum specifications, then, as needed, the foundation shall be improved per the following:

- 3000 psi concrete, Grade 40 reinforcing steel, Lap splices min. 24"
- The footing shall be a minimum of 16"x8" with (2) #4 bars continuous.
- The wall shall be a minimum of 8" thick with #4 bars at 24" O.C. each way.
- The walkout frost trench shall be a minimum of 12" wide by 36" deep with (2) #4 bars continuous T&B.
- Grade beams/thickened slabs shall be a minimum of 16" wide by 12" deep with (3) #4 bars continuous T&B.
- The garage and basement slabs shall be structural.
- Place 5" concrete slab w/ #4 bars at 12" O.C. each-way on 1-1/2" chairs.
- Add (4) 10'-0" long #4 bars each-way over the column pads and slab support piers. Place with 1" to 1-1/2" slab top cover (3" chairs). See attached layout and slab details for clarity.

The perimeter of the slab shall bear on the foundation as follows:

- Minimum 3" keyway or footing; OR Drill 5" deep and pin to foundation with #4 bars at 12" on center.

SEE ATTACHED PIER LAYOUT SPECIFICATIONS

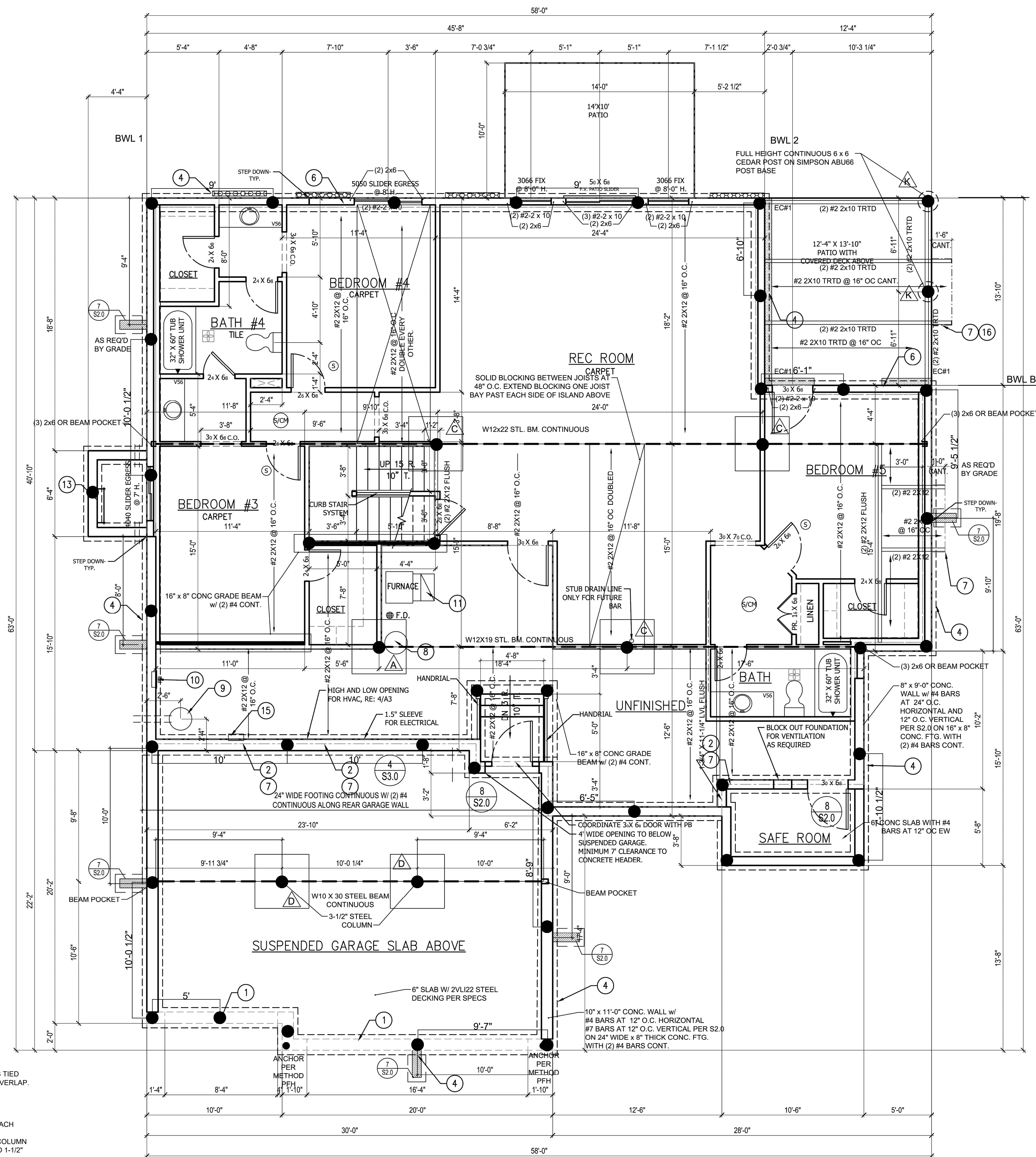
The above recommendation is based on bearing capacity only, determined by standard engineering practices. Geotechnical testing and laboratory analysis of subgrade materials (including shrink/swell potential) were outside of the scope of this design.

Sincerely,



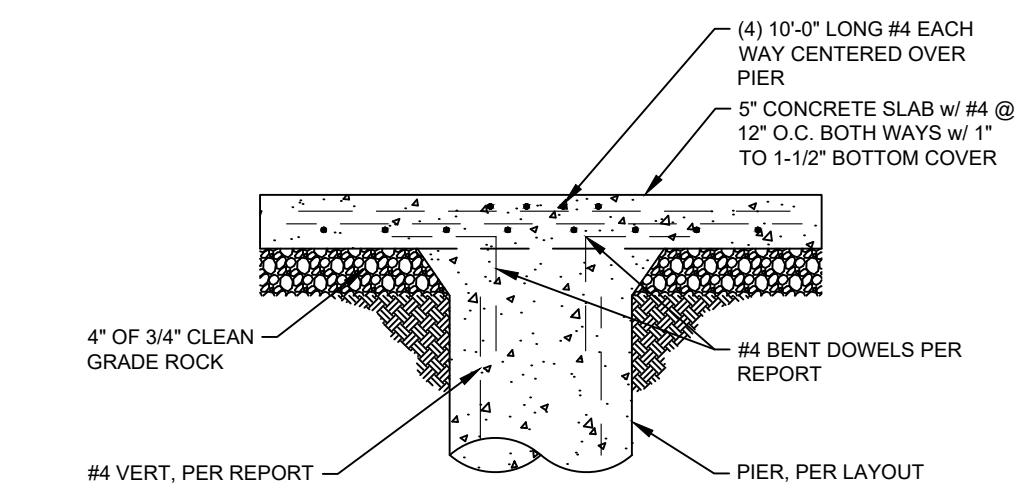
Bradley Huxol, PE



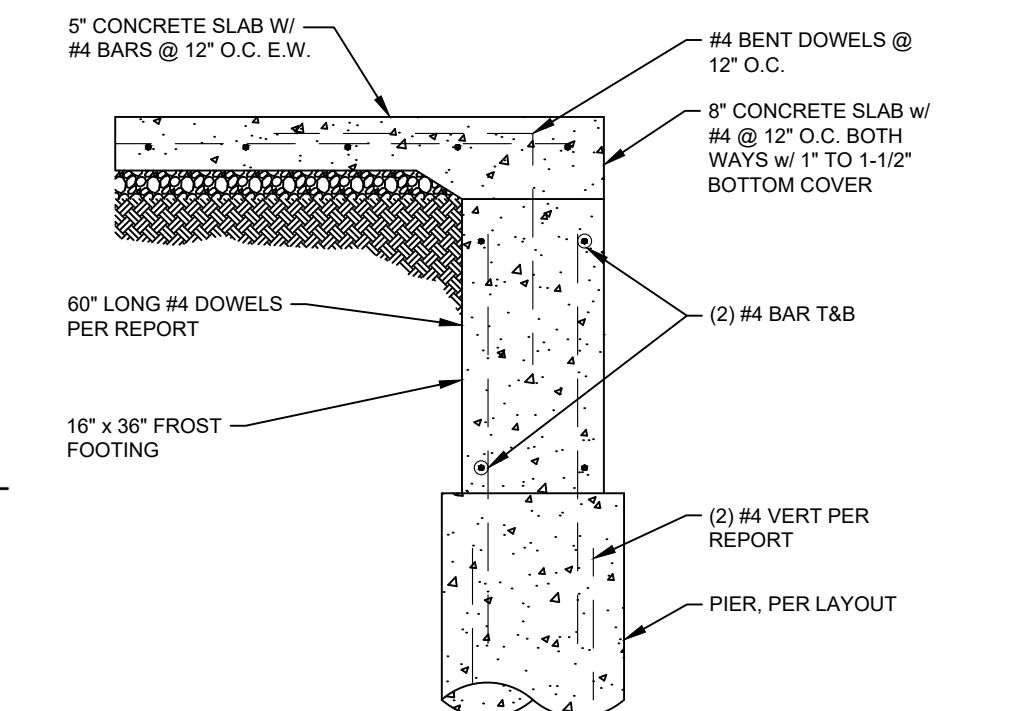


PIER LAYOUT

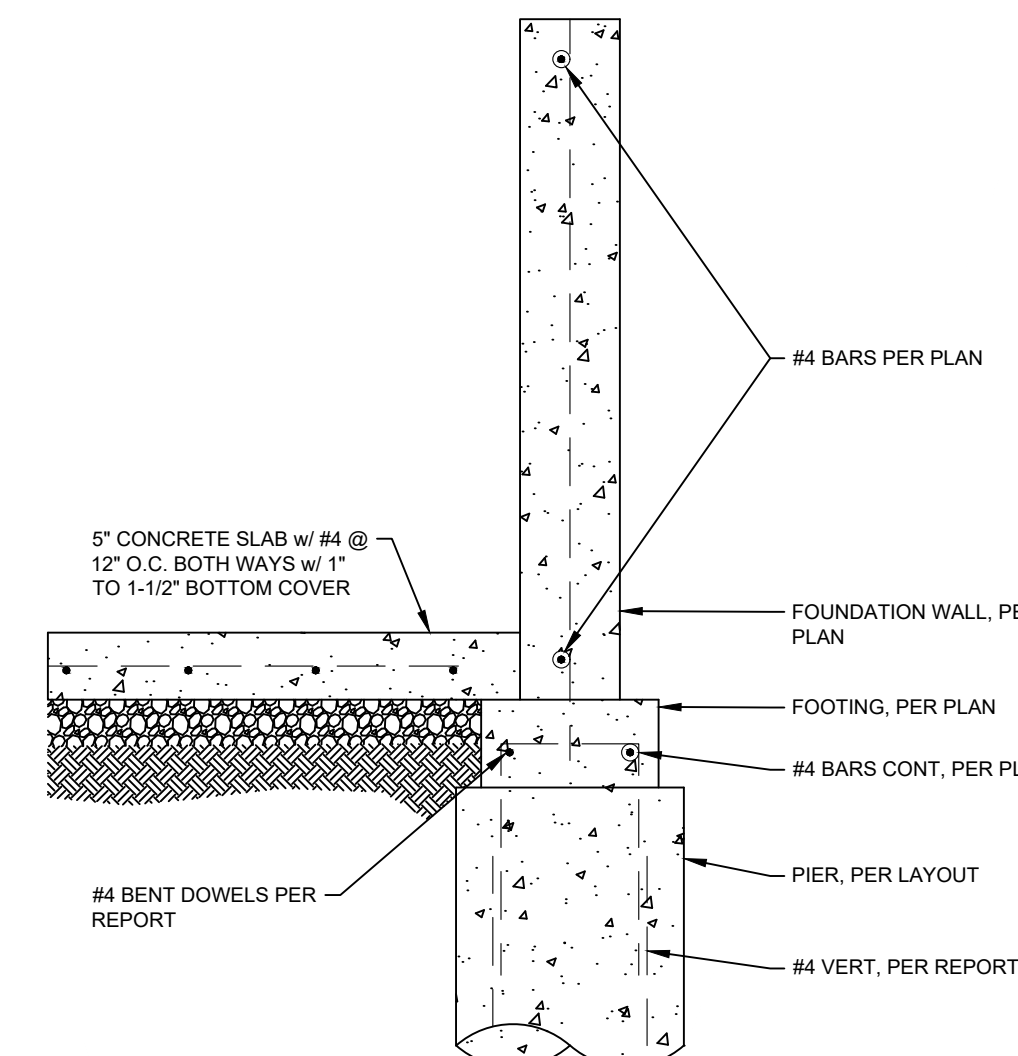
4413 SW NAUTILUS PL
LEES SUMMIT, MO 64082



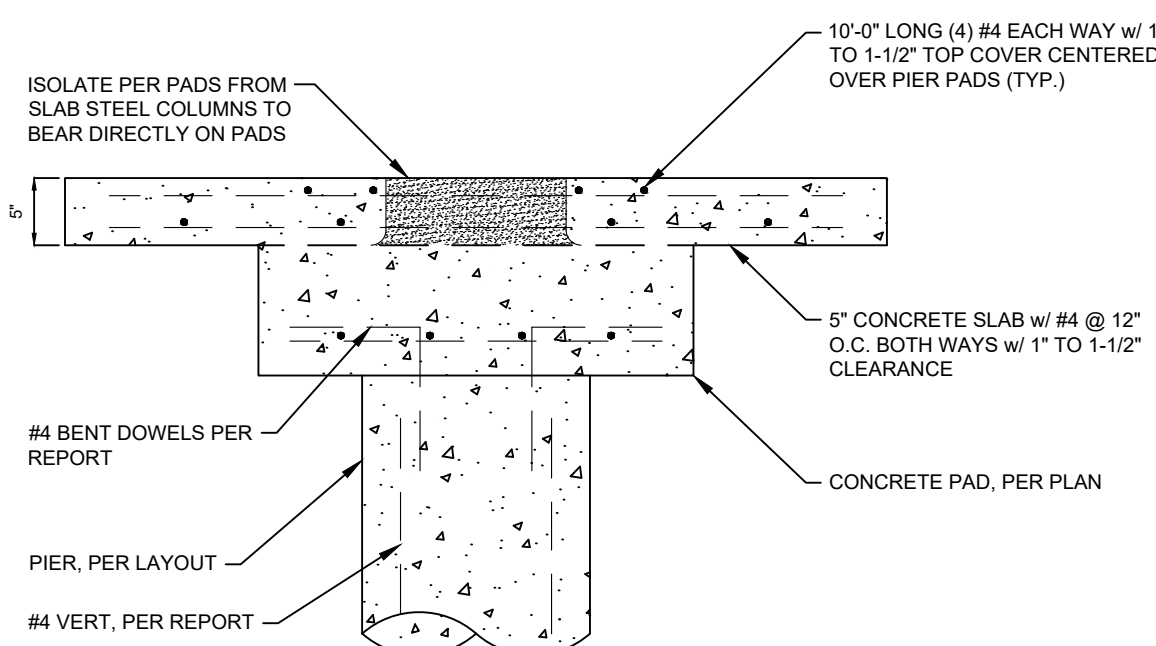
6
S2.1
SLAB SUPPORT PIER DETAIL
N.T.S.



5
S2.1
PIER / FROST FOOTING DETAIL
N.T.S.



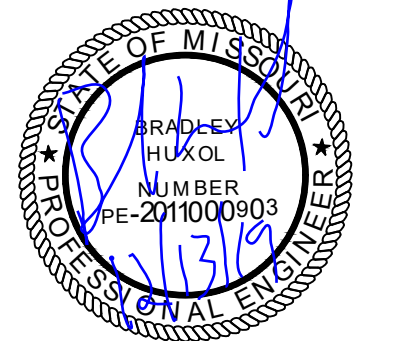
8
S2.1
PIER / FOOTING DETAIL
N.T.S.



4
S2.1
PIER / PAD DETAIL
N.T.S.



RESIDENTIAL ENGINEERING SERVICES, LLC
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21 CREEKSIDE AT RAIN TREE

SUMMIT CUSTOM HOMES

4413 SW NAUTILUS PL
LEES SUMMIT, MO 64082

12/13/2019

SHEET #

A3.1