

**Robert L. Bayless, Producer LLC****WEAVER RIDGE #13-16**

SHL: 2056' FSL &amp; 872' FEL (NESE)

BHL: 833' FSL &amp; 663' FEL (SESE)

Sec. 13 T1S R104W

Rio Blanco County, Colorado

**SURFACE CASING AND CENTRALIZER DESIGN**

Proposed Total Depth:	4,670 ft	Proposed Depth of Surface Casing:	500 ft
Estimated Pressure Gradient:	0.42 psi/ft		
Bottom Hole Pressure at 4,670 ft		Hydrostatic Head of gas/oil mud:	0.22 psi/ft
0.42 psi/ft x 4,670 ft =	1,961 psi	0.22 psi/ft x 4,670 ft =	1027 psi

**Maximum Design Surface Pressure**

Bottom Hole Pressure	–	Hydrostatic Head	=	
(0.42 psi/ft x 4,670 ft)	–	(0.22 psi/ft x 4,670 ft)	=	
1,961 psi	–	1027 psi	=	934 psi

**Casing Strengths** 9-5/8" J-55 36.0 #/ft ST&C

<u>Wt (#/ft)</u>	<u>Tension (lbs)</u>	<u>Burst (psi)</u>	<u>Collapse (psi)</u>
36.0	394,000	3,520	2,020

**Safety Factors**

Minimum Standards:	Tension (Dry): 1.8	Burst: 1.0	Collapse: 1.125
Tension (Dry): Casing Weight:	36.0 #/ft x 500 ft	=	18,000 lbs
Safety Factor:	394,000 lbs / 18,000 lbs	=	<b><u>21.89</u></b> OK
Burst:	Safety Factor: 3,520 psi / 933 psi	=	<b><u>3.77</u></b> OK
Collapse:	Hydrostatic: 0.052 x 9.0 ppg x 500 ft	=	234 psi
Safety Factor:	2,020 psi / 234 psi	=	<b><u>8.63</u></b> OK

Use: 500 ft of 9 5/8" J-55 36.0 #/ft ST&C casingUse: 3M BOPE and casinghead**Centralizers**

Use 6 total

- 1 middle of bottom joint
- 1 top of second joint
- 1 top of third joint
- 1 every other joint (±80 ft)

Total centralized ± 420 ft

Note that field experience indicates that additional centralizers greatly increase the chance of "sticking" the surface casing prior to reaching surface casing total depth.