

Whiting Oil and Gas Corporation

Weld County, CO
Sec. 25-T10N-R58W
Razor #25B-2556

Plan A

Plan: Rev A0

Sperry Drilling Services Proposal Report

16 December, 2013

Well Coordinates: 1,544,622.89 N, 3,467,689.53 E (40° 48' 58.10" N, 103° 48' 36.98" W)

Ground Level: 4,756.40 usft

Local Coordinate Origin:

Centered on Well Razor #25B-2556

Viewing Datum:

KB 22 ft @ 4778.40usft (Frontier 26)

TVDs to System:

N

North Reference:

True

Unit System:

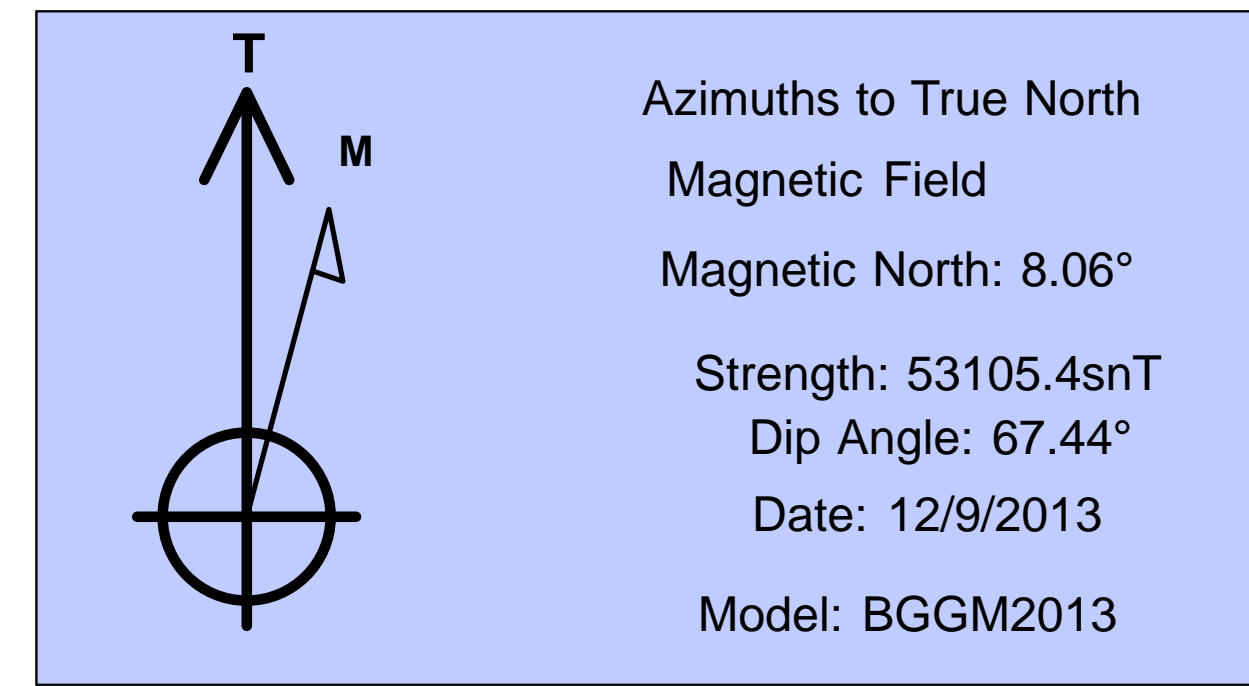
API - US Survey Feet - Custom

Geodetic Scale Factor Applied

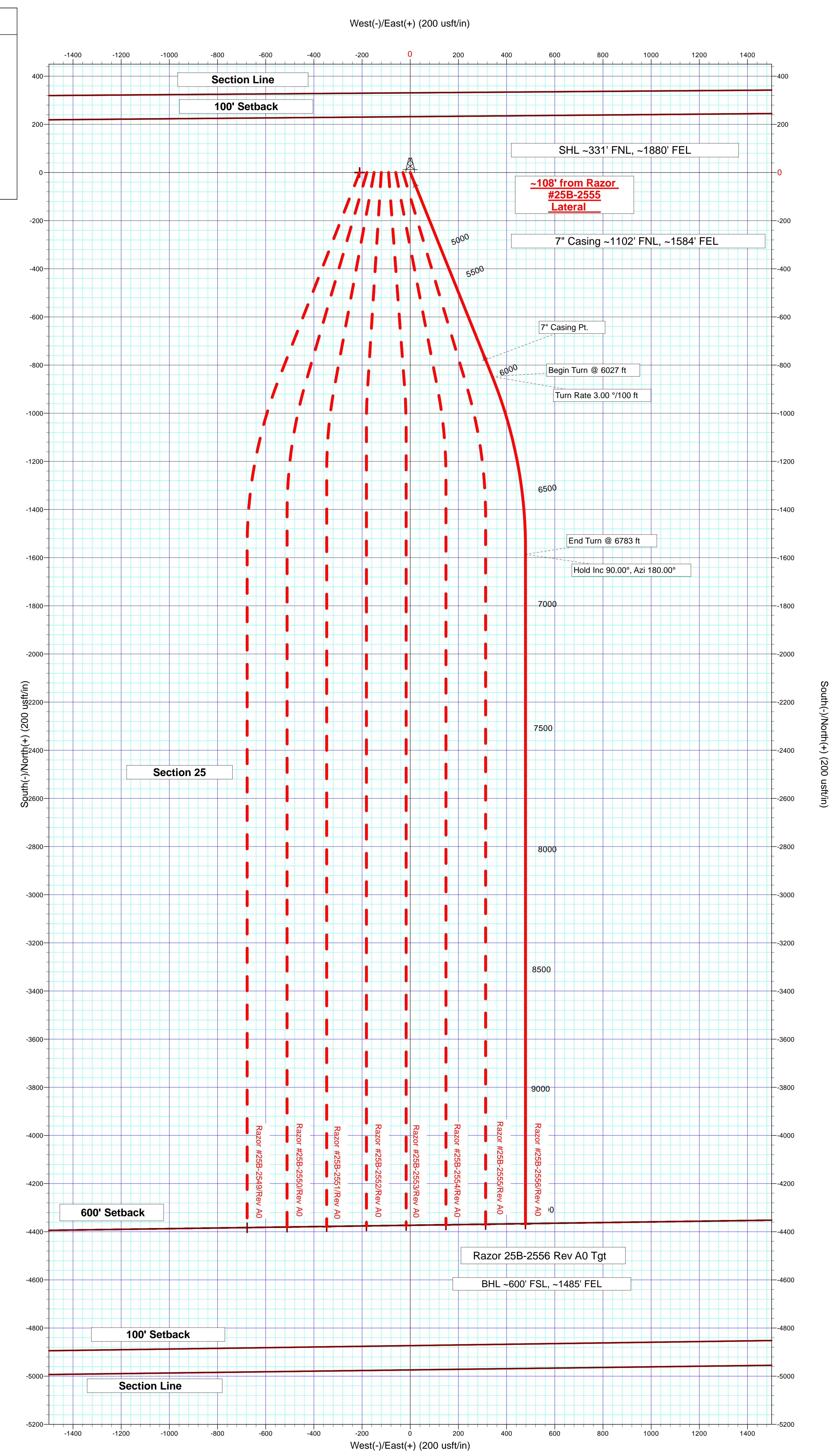
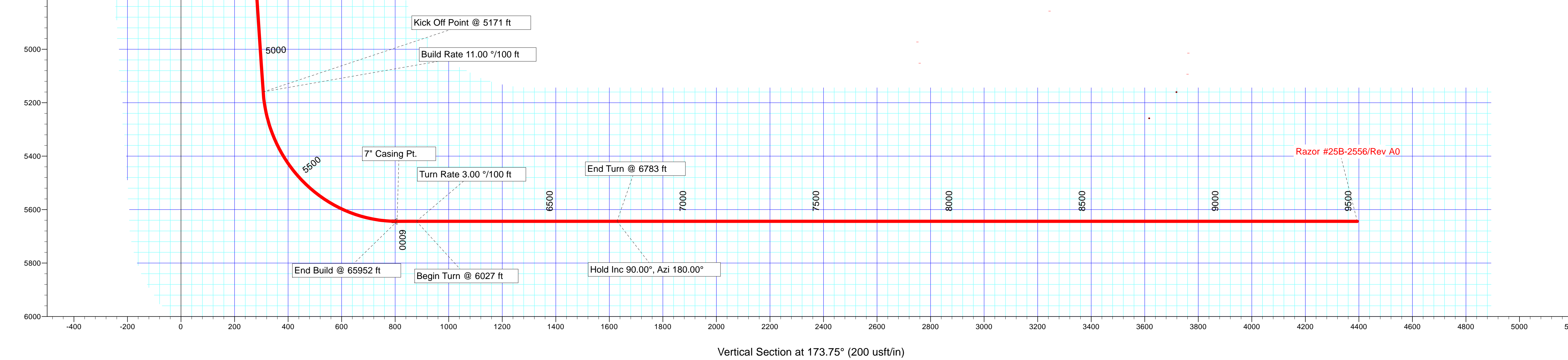
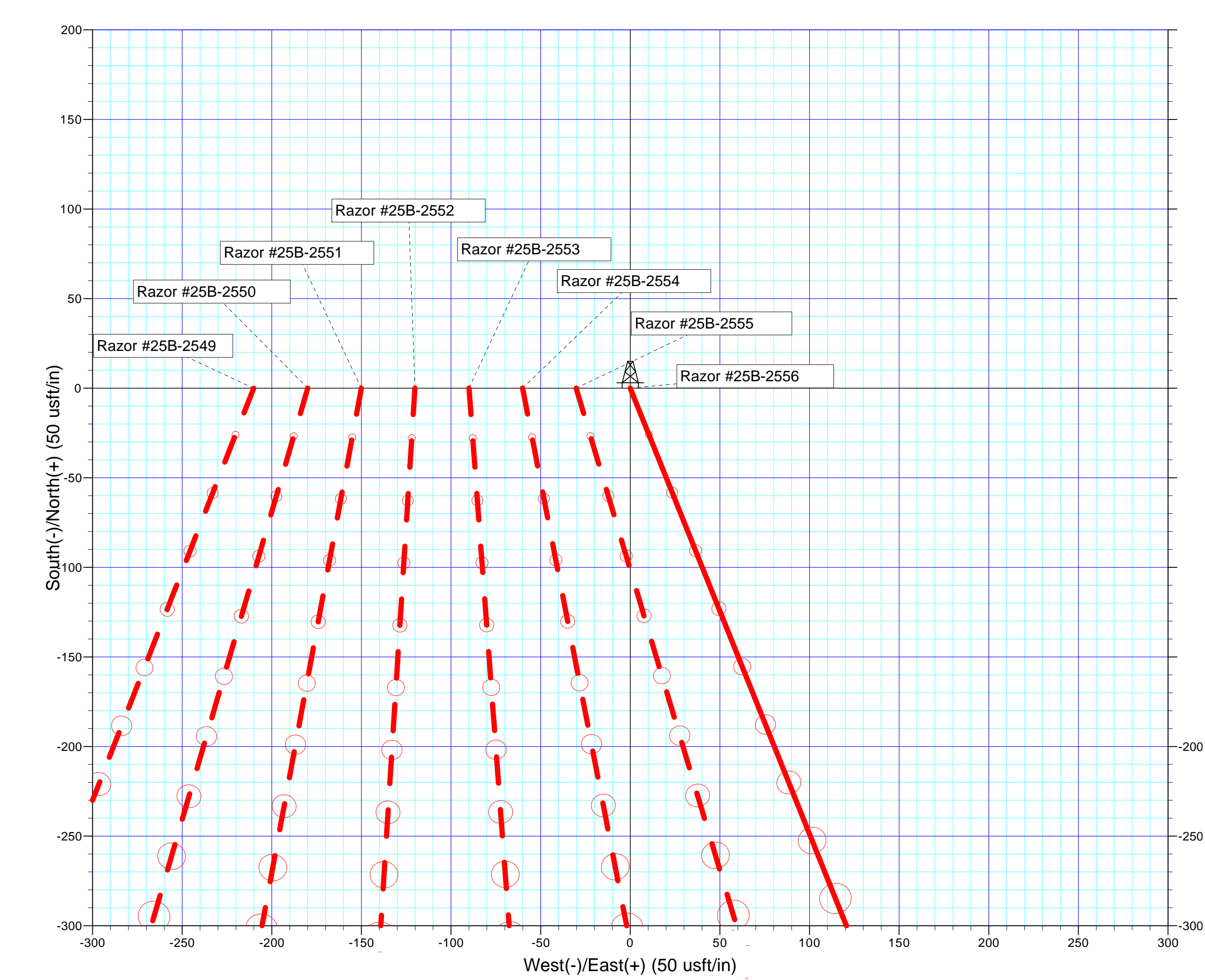
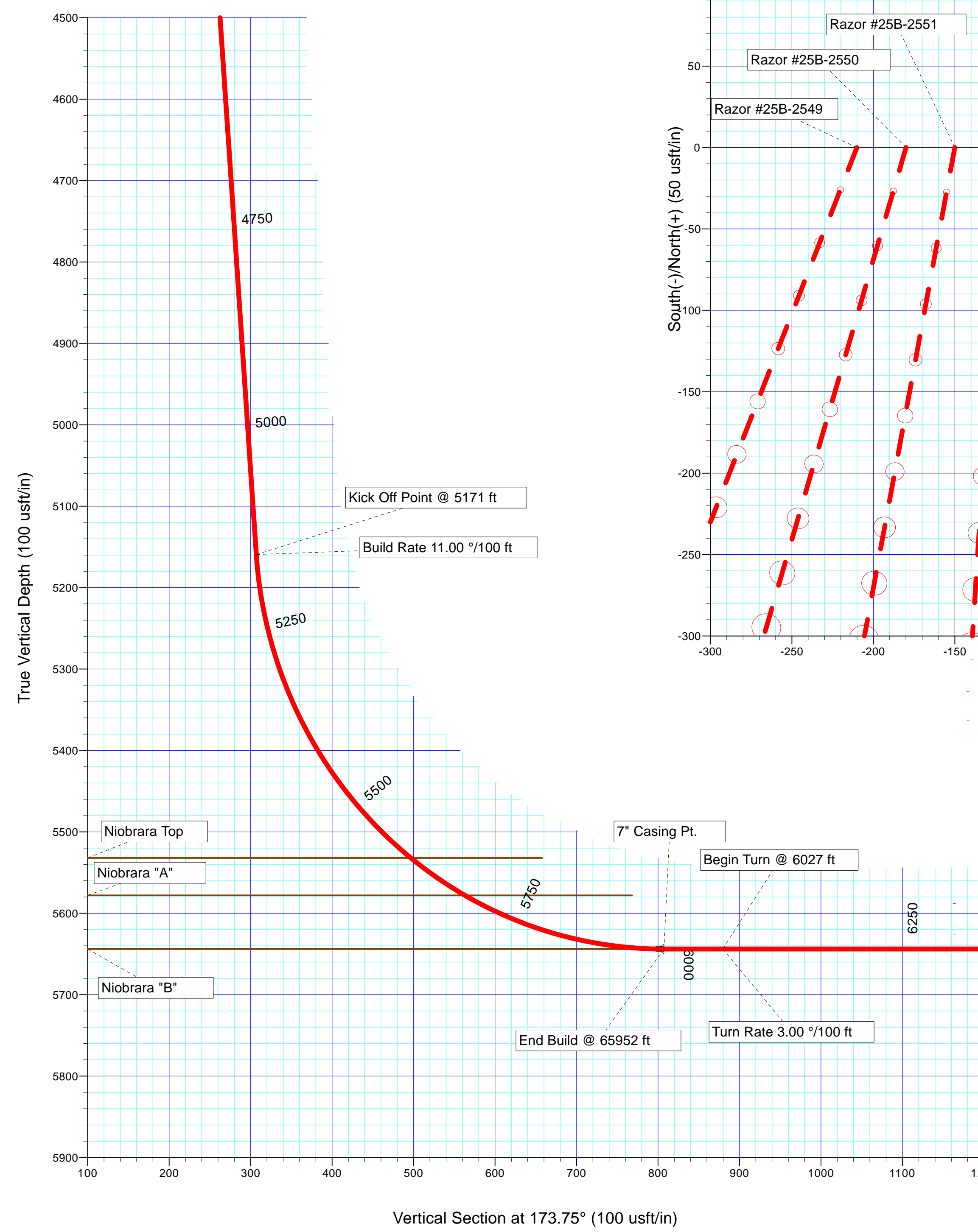
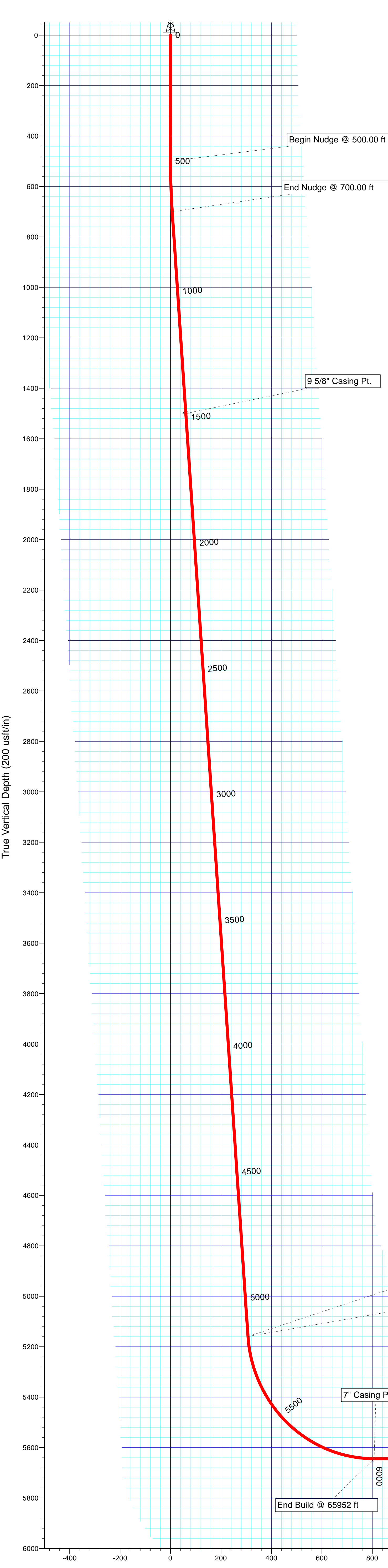
Version: 5000.1 Build: 70

HALLIBURTON

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00		
3	700.00	4.00	158.10	699.84	-6.47	2.60	2.00	158.10	6.72		
4	5170.51	4.00	158.10	5159.46	-295.82	118.92	0.00	0.00	307.01		
5	5952.33	90.00	158.10	5644.00	-777.92	312.72	11.00	0.00	807.35		
6	6027.33	90.00	158.10	5644.00	-847.51	340.70	0.00	0.00	879.57		
7	6757.42	90.00	180.00	5644.00	-1559.95	478.52	3.00	90.00	1602.78		
8	9565.49	90.00	180.00	5644.00	-4368.02	478.39	0.00	0.00	4394.14	Razor 25B-2556 Rev A0 Tgt	



Plan: Rev A0 (Razor #25B-2556/Plan A)
 Created By: Troy L. Stoute Date: 15:33, December 16 2013
 Checked: _____ Date: _____
 Reviewed: _____ Date: _____
 Approved: _____ Date: _____



Plan Report for Razor #25B-2556 - Rev A0

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 500.00 ft										
600.00	2.00	158.10	599.98	-1.62	0.65	1.68	2.00	2.00	0.00	158.10
700.00	4.00	158.10	699.84	-6.47	2.60	6.72	2.00	2.00	0.00	0.00
End Nudge @ 700.00 ft										
800.00	4.00	158.10	799.59	-12.95	5.20	13.44	0.00	0.00	0.00	0.00
900.00	4.00	158.10	899.35	-19.42	7.81	20.15	0.00	0.00	0.00	0.00
1,000.00	4.00	158.10	999.11	-25.89	10.41	26.87	0.00	0.00	0.00	0.00
1,100.00	4.00	158.10	1,098.86	-32.36	13.01	33.59	0.00	0.00	0.00	0.00
1,200.00	4.00	158.10	1,198.62	-38.84	15.61	40.31	0.00	0.00	0.00	0.00
1,300.00	4.00	158.10	1,298.38	-45.31	18.21	47.02	0.00	0.00	0.00	0.00
1,400.00	4.00	158.10	1,398.13	-51.78	20.82	53.74	0.00	0.00	0.00	0.00
1,500.00	4.00	158.10	1,497.89	-58.25	23.42	60.46	0.00	0.00	0.00	0.00
1,502.12	4.00	158.10	1,500.00	-58.39	23.47	60.60	0.00	0.00	0.00	0.00
9 5/8" Casing Pt.										
1,600.00	4.00	158.10	1,597.65	-64.73	26.02	67.17	0.00	0.00	0.00	0.00
1,700.00	4.00	158.10	1,697.40	-71.20	28.62	73.89	0.00	0.00	0.00	0.00
1,800.00	4.00	158.10	1,797.16	-77.67	31.22	80.61	0.00	0.00	0.00	0.00
1,900.00	4.00	158.10	1,896.91	-84.14	33.82	87.32	0.00	0.00	0.00	0.00
2,000.00	4.00	158.10	1,996.67	-90.61	36.43	94.04	0.00	0.00	0.00	0.00
2,100.00	4.00	158.10	2,096.43	-97.09	39.03	100.76	0.00	0.00	0.00	0.00
2,200.00	4.00	158.10	2,196.18	-103.56	41.63	107.48	0.00	0.00	0.00	0.00
2,300.00	4.00	158.10	2,295.94	-110.03	44.23	114.19	0.00	0.00	0.00	0.00
2,400.00	4.00	158.10	2,395.70	-116.50	46.83	120.91	0.00	0.00	0.00	0.00
2,500.00	4.00	158.10	2,495.45	-122.98	49.44	127.63	0.00	0.00	0.00	0.00
2,600.00	4.00	158.10	2,595.21	-129.45	52.04	134.34	0.00	0.00	0.00	0.00
2,700.00	4.00	158.10	2,694.97	-135.92	54.64	141.06	0.00	0.00	0.00	0.00
2,800.00	4.00	158.10	2,794.72	-142.39	57.24	147.78	0.00	0.00	0.00	0.00
2,900.00	4.00	158.10	2,894.48	-148.86	59.84	154.49	0.00	0.00	0.00	0.00
3,000.00	4.00	158.10	2,994.23	-155.34	62.45	161.21	0.00	0.00	0.00	0.00
3,100.00	4.00	158.10	3,093.99	-161.81	65.05	167.93	0.00	0.00	0.00	0.00
3,200.00	4.00	158.10	3,193.75	-168.28	67.65	174.65	0.00	0.00	0.00	0.00
3,300.00	4.00	158.10	3,293.50	-174.75	70.25	181.36	0.00	0.00	0.00	0.00
3,400.00	4.00	158.10	3,393.26	-181.23	72.85	188.08	0.00	0.00	0.00	0.00
3,500.00	4.00	158.10	3,493.02	-187.70	75.45	194.80	0.00	0.00	0.00	0.00
3,600.00	4.00	158.10	3,592.77	-194.17	78.06	201.51	0.00	0.00	0.00	0.00
3,700.00	4.00	158.10	3,692.53	-200.64	80.66	208.23	0.00	0.00	0.00	0.00
3,800.00	4.00	158.10	3,792.29	-207.11	83.26	214.95	0.00	0.00	0.00	0.00
3,900.00	4.00	158.10	3,892.04	-213.59	85.86	221.67	0.00	0.00	0.00	0.00
4,000.00	4.00	158.10	3,991.80	-220.06	88.46	228.38	0.00	0.00	0.00	0.00
4,100.00	4.00	158.10	4,091.56	-226.53	91.07	235.10	0.00	0.00	0.00	0.00
4,200.00	4.00	158.10	4,191.31	-233.00	93.67	241.82	0.00	0.00	0.00	0.00
4,300.00	4.00	158.10	4,291.07	-239.48	96.27	248.53	0.00	0.00	0.00	0.00
4,400.00	4.00	158.10	4,390.82	-245.95	98.87	255.25	0.00	0.00	0.00	0.00
4,500.00	4.00	158.10	4,490.58	-252.42	101.47	261.97	0.00	0.00	0.00	0.00
4,600.00	4.00	158.10	4,590.34	-258.89	104.07	268.68	0.00	0.00	0.00	0.00
4,700.00	4.00	158.10	4,690.09	-265.37	106.68	275.40	0.00	0.00	0.00	0.00
4,800.00	4.00	158.10	4,789.85	-271.84	109.28	282.12	0.00	0.00	0.00	0.00
4,900.00	4.00	158.10	4,889.61	-278.31	111.88	288.84	0.00	0.00	0.00	0.00
5,000.00	4.00	158.10	4,989.36	-284.78	114.48	295.55	0.00	0.00	0.00	0.00
5,100.00	4.00	158.10	5,089.12	-291.25	117.08	302.27	0.00	0.00	0.00	0.00
5,170.51	4.00	158.10	5,159.46	-295.82	118.92	307.01	0.00	0.00	0.00	0.00
Kick Off Point @ 5171 ft - Build Rate 11.00 °/100 ft										

Plan Report for Razor #25B-2556 - Rev A0

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
5,200.00	7.24	158.10	5,188.80	-298.50	120.00	309.79	11.00	11.00	0.00	0.00
5,300.00	18.24	158.10	5,286.19	-318.93	128.21	331.00	11.00	11.00	0.00	0.00
5,400.00	29.24	158.10	5,377.58	-356.24	143.21	369.71	11.00	11.00	0.00	0.00
5,500.00	40.24	158.10	5,459.63	-409.03	164.43	424.50	11.00	11.00	0.00	0.00
5,600.00	51.24	158.10	5,529.31	-475.38	191.10	493.36	11.00	11.00	0.00	0.00
5,604.32	51.72	158.10	5,532.00	-478.52	192.36	496.62	11.00	11.00	0.00	0.00
Niobrara Top										
5,687.28	60.84	158.10	5,578.00	-542.47	218.07	562.99	11.00	11.00	0.00	0.00
Niobrara "A"										
5,700.00	62.24	158.10	5,584.06	-552.85	222.25	573.76	11.00	11.00	0.00	0.00
5,800.00	73.24	158.10	5,621.88	-638.59	256.71	662.74	11.00	11.00	0.00	0.00
5,900.00	84.24	158.10	5,641.37	-729.45	293.24	757.04	11.00	11.00	0.00	0.00
5,952.33	90.00	158.10	5,644.00	-777.92	312.72	807.35	11.00	11.00	0.00	0.00
End Build @ 65952 ft - Niobrara "B"										
5,952.37	90.00	158.10	5,644.00	-777.96	312.74	807.38	0.00	0.00	0.00	0.00
7" Casing Pt.										
6,000.00	90.00	158.10	5,644.00	-822.15	330.50	853.25	0.00	0.00	0.00	0.00
6,027.33	90.00	158.10	5,644.00	-847.51	340.70	879.57	0.00	0.00	0.00	0.00
Begin Turn @ 6027 ft - Turn Rate 3.00 °/100 ft										
6,100.00	90.00	160.28	5,644.00	-915.44	366.51	949.90	3.00	0.00	3.00	90.00
6,200.00	90.00	163.28	5,644.00	-1,010.41	397.78	1,047.71	3.00	0.00	3.00	90.00
6,300.00	90.00	166.28	5,644.00	-1,106.89	424.03	1,146.48	3.00	0.00	3.00	90.00
6,400.00	90.00	169.28	5,644.00	-1,204.62	445.19	1,245.92	3.00	0.00	3.00	90.00
6,500.00	90.00	172.28	5,644.00	-1,303.31	461.21	1,345.78	3.00	0.00	3.00	90.00
6,600.00	90.00	175.28	5,644.00	-1,402.71	472.04	1,445.77	3.00	0.00	3.00	90.00
6,700.00	90.00	178.28	5,644.00	-1,502.54	477.66	1,545.62	3.00	0.00	3.00	90.00
6,757.42	90.00	180.00	5,644.00	-1,559.95	478.52	1,602.78	3.00	0.00	3.00	90.00
6,783.44	90.00	180.00	5,644.00	-1,585.97	478.52	1,628.64	0.00	0.00	0.00	0.00
End Turn @ 6783 ft - Hold Inc 90.00°, Azi 180.00°										
6,800.00	90.00	180.00	5,644.00	-1,602.53	478.52	1,645.11	0.00	0.00	0.00	0.00
6,900.00	90.00	180.00	5,644.00	-1,702.53	478.51	1,744.51	0.00	0.00	0.00	0.00
7,000.00	90.00	180.00	5,644.00	-1,802.53	478.51	1,843.92	0.00	0.00	0.00	0.00
7,100.00	90.00	180.00	5,644.00	-1,902.53	478.50	1,943.32	0.00	0.00	0.00	0.00
7,200.00	90.00	180.00	5,644.00	-2,002.53	478.50	2,042.73	0.00	0.00	0.00	0.00
7,300.00	90.00	180.00	5,644.00	-2,102.53	478.50	2,142.13	0.00	0.00	0.00	0.00
7,400.00	90.00	180.00	5,644.00	-2,202.53	478.49	2,241.54	0.00	0.00	0.00	0.00
7,500.00	90.00	180.00	5,644.00	-2,302.53	478.49	2,340.94	0.00	0.00	0.00	0.00
7,600.00	90.00	180.00	5,644.00	-2,402.53	478.48	2,440.35	0.00	0.00	0.00	0.00
7,700.00	90.00	180.00	5,644.00	-2,502.53	478.48	2,539.75	0.00	0.00	0.00	0.00
7,800.00	90.00	180.00	5,644.00	-2,602.53	478.47	2,639.16	0.00	0.00	0.00	0.00
7,900.00	90.00	180.00	5,644.00	-2,702.53	478.47	2,738.56	0.00	0.00	0.00	0.00
8,000.00	90.00	180.00	5,644.00	-2,802.53	478.46	2,837.97	0.00	0.00	0.00	0.00
8,100.00	90.00	180.00	5,644.00	-2,902.53	478.46	2,937.37	0.00	0.00	0.00	0.00
8,200.00	90.00	180.00	5,644.00	-3,002.53	478.46	3,036.78	0.00	0.00	0.00	0.00
8,300.00	90.00	180.00	5,644.00	-3,102.53	478.45	3,136.18	0.00	0.00	0.00	0.00
8,400.00	90.00	180.00	5,644.00	-3,202.53	478.45	3,235.59	0.00	0.00	0.00	0.00
8,500.00	90.00	180.00	5,644.00	-3,302.53	478.44	3,334.99	0.00	0.00	0.00	0.00
8,600.00	90.00	180.00	5,644.00	-3,402.53	478.44	3,434.40	0.00	0.00	0.00	0.00
8,700.00	90.00	180.00	5,644.00	-3,502.53	478.43	3,533.80	0.00	0.00	0.00	0.00
8,800.00	90.00	180.00	5,644.00	-3,602.53	478.43	3,633.21	0.00	0.00	0.00	0.00
8,900.00	90.00	180.00	5,644.00	-3,702.53	478.42	3,732.61	0.00	0.00	0.00	0.00
9,000.00	90.00	180.00	5,644.00	-3,802.53	478.42	3,832.02	0.00	0.00	0.00	0.00
9,100.00	90.00	180.00	5,644.00	-3,902.53	478.41	3,931.42	0.00	0.00	0.00	0.00
9,200.00	90.00	180.00	5,644.00	-4,002.53	478.41	4,030.83	0.00	0.00	0.00	0.00
9,300.00	90.00	180.00	5,644.00	-4,102.53	478.41	4,130.23	0.00	0.00	0.00	0.00
9,400.00	90.00	180.00	5,644.00	-4,202.53	478.40	4,229.64	0.00	0.00	0.00	0.00
9,500.00	90.00	180.00	5,644.00	-4,302.53	478.40	4,329.04	0.00	0.00	0.00	0.00
9,565.49	90.00	180.00	5,644.00	-4,368.02	478.39	4,394.14	0.00	0.00	0.00	0.00

Plan Report for Razor #25B-2556 - Rev A0**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	500.00	0.00	0.00	Begin Nudge @ 500.00 ft
700.00	699.84	-6.47	2.60	End Nudge @ 700.00 ft
5,170.51	5,159.46	-295.82	118.92	Kick Off Point @ 5171 ft
5,170.51	5,159.46	-295.82	118.92	Build Rate 11.00 °/100 ft
5,952.33	5,644.00	-777.92	312.72	End Build @ 65952 ft
6,027.33	5,644.00	-847.51	340.70	Begin Turn @ 6027 ft
6,027.33	5,644.00	-847.51	340.70	Turn Rate 3.00 °/100 ft
6,783.44	5,644.00	-1,585.97	478.52	End Turn @ 6783 ft
6,783.44	5,644.00	-1,585.97	478.52	Hold Inc 90.00°, Azi 180.00°
9,569.75				Total Depth 9569.76 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Razor 25B-2556 Rev A0 Tgt	173.75	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	1,500.00	Rev A0	MWD+IFR1+MS+sag
1,500.00	5,952.33	Rev A0	MWD+IFR1+MS+sag
5,952.33	9,564.66	Rev A0	MWD+IFR1+MS+sag

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,502.12	1,500.00	9 5/8" Casing Pt.	9-5/8	13-1/2
5,952.37	5,644.00	7" Casing Pt.	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,604.32	5,532.00	Niobrara Top		0.00	
5,687.28	5,578.00	Niobrara "A"		0.00	
5,952.33	5,644.00	Niobrara "B"		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Razor 25B-2556 Rev A0 Tgt	5,644.00	-4,368.02	478.39	Point

Plan Report for Razor #25B-2556 - Rev A0

Directional Difficulty Index

Average Dogleg over Survey:	1.18 °/100usft	Maximum Dogleg over Survey:	11.00 °/100usft at 5,952.33 usft
Net Tortosity applicable to Plans:	1.18 °/100usft	Directional Difficulty Index:	6.057

Audit Info

North Reference Sheet for Sec. 25-T10N-R58W - Razor #25B-2556 - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to KB 22 ft @ 4778.40usft (Frontier 26). Northing and Easting are relative to Razor #25B-2556

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 1.00000549

Grid Coordinates of Well: 1,544,622.89 usft N, 3,467,689.53 usft E

Geographical Coordinates of Well: 40° 48' 58.10" N, 103° 48' 36.98" W

Grid Convergence at Surface is: 1.09°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,565.49usft the Bottom Hole Displacement is 4,394.14usft in the Direction of 173.75° (True).

Magnetic Convergence at surface is: -6.97° (9 December 2013, , BGGM2013)

