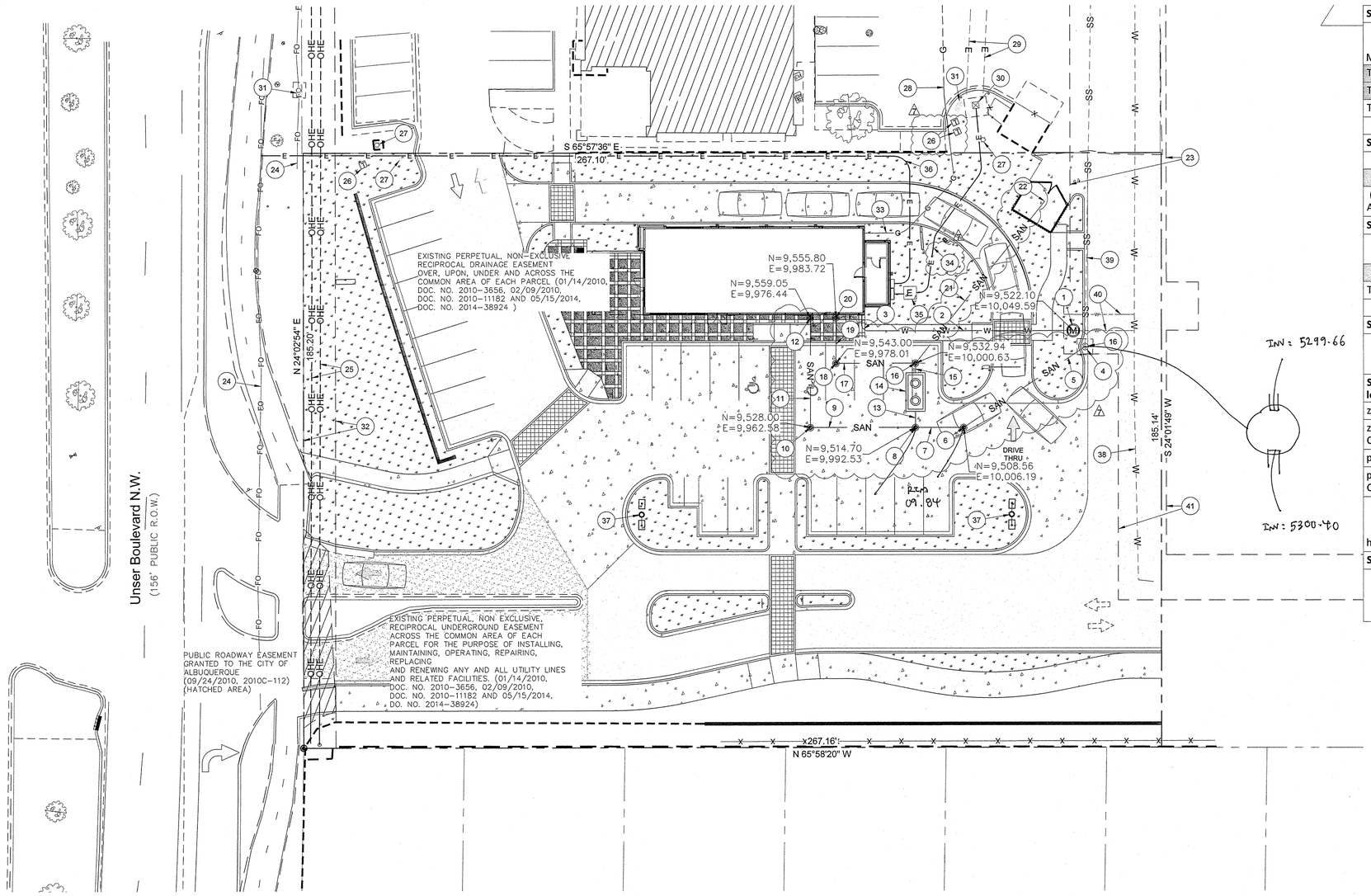

Step 1 - Head loss in pipe						
Material	Nominal Diameter (in)	L (Length, FT)	C (Hazen-Williams C-factor)	Inside Dia. (D, inches)	Flow Rate (Q, gpm)	Head Loss (hp, ft)
Type K Copper	1 1/2	68	130	1.481	31.4	7.54
Type K Copper	1 1/2	0	130	1.481	31.4	0.00
Total Piping Head Loss, hp						**7.54**

Step 2 - Minor loss in meter		
Meter Type	Meter Size (in)	k (minor loss)	Head Loss (hm, ft)
Displacement	1	4.6	**2.46**
(k per table 5-3 of AWWA M22 Manual)			

Step 3 - Minor loss in bends / fittings					
Appurtenance Type:	# of fittings	Diameter (in)	k (minor loss)	Single Head Loss (h, ft)	Total Head Loss (h, ft)
Gate Valve - Fully Open	1	0.995	0.15	0.39	0.39
Total Minor Loss in Bends/ Fittings					**0.39**

Step 4 - Total head loss			
htot (Total head loss)	=	Pipe loss + Meter loss + Minor losses	= **10.40** ft

Step 5 - Allowable head loss			
zm (Elevation @ Main)	7996.75	ft	
zc (Elevation @ Customer)	8002.75	ft	
pm (Pressure @ Main)	48	psi	
pc (Pressure @ Customer)	35	psi	
ha (Allowable head loss)	=	ha = (zm - zc) + 2.31(pm - pc)	= **24.03** ft

Step 6 - Sizing Check			
Service line check	=	ha ≥ htot, Service line OK if not RESIZE	= **OK**

nn

GRADING AS-BUILT 6/8/17

THOMAS D. JOHNSTON
NEW MEXICO
14269
REGISTERED LAND SURVEYOR
6/9/17

FIXTURE	FIXTURE VALUE 60 PSI	NO. OF FIXTURES	FIXTURE VALUES
Bathtub	8	0	0
Bedpan Washers	10	0	0
Bidet	2	0	0
Dental Unit	2	0	0
Drinking Fountain - Public	2	0	0
Kitchen Sink	2.2	2	4.4
Lavatory	1.5	2	3
Showerhead (Shower Only)	2.5	0	0
Service Sink	4	1	4
Toilet - Flush Valve	35	0	0
Toilet - Tank Type	4	2	8
Urinal - Pedestal Flush Valve	35	0	0
Urinal - Wall Flush Valve	16	0	0
Wash Sink (Each Set of Faucets)	4	3	12
Dishwasher	2	0	0
Washing Machine	6	0	0
Hose (50 ft Wash Down)			0
- 1/2 in.	5	0	0
- 5/8 in.	9	1	0
- 3/4 in.	12	0	0
(per figure 4-5 of AWWA M22 Manual)	COMBINED FIXTURE TOTAL VALUE		31.4

UTILITY LEGEND

SANITARY SEWER	SAN
WATER LINE	W
GAS LINE	G
ELECTRICAL	E
OVERHEAD POWER LINES	OHE
IRRIGATION LINE	IR
ELECTRICAL BOX	
SITE LIGHT	
SIGN	
MANHOLES	ST SS
INLET	
METER PIT	M
GATE VALVE	WV
THRUST BLOCK	
CLEAN OUT	CO
GAS METER	G
FIRE HYDRANT	
WATER METER	W

KEY NOTES:

1. PROPOSED 1.5" DOMESTIC WATER METER
2. PROPOSED 68 L.F. 1.5" TYPE 'K' COPPER DOMESTIC SERVICE LINE
3. PROPOSED 2' RADIUS SWEEP
4. PROPOSED CONNECTION TO EXISTING SANITARY SYSTEM AT EXISTING MANHOLE
   RIM ELEV. = ~~5306.29~~ 5306.31
   EX. INV. OUT = 5299.48
   PRO. INV. IN = 5299.88
5. PROPOSED 45.36' 4" PVC @ 2.58% SANITARY SERVICE LINE
6. PROPOSED SANITARY SEWER CLEAN OUT
   INV. =5301.05
7. PROPOSED 15.00' 4" PVC @ 2.20% SANITARY SERVICE LINE
8. PROPOSED SANITARY SEWER CLEAN OUT
   INV. = 5301.38
9. PROPOSED 33.74' 4" PVC @ 5.03% SANITARY SERVICE LINE
10. PROPOSED SANITARY SEWER CLEAN OUT
    INV. = 5303.17
11. PROPOSED 33.29' 4" PVC @ 5.03% SANITARY SERVICE LINE
12. PROPOSED SANITARY SEWER 2-WAY CLEAN OUT (RE: PLUMBING FOR CONTINUATION TO BUILDING)
    INV. = 5304.75
13. PROPOSED 5.00' 4" PVC @ 2.20% SANITARY SERVICE LINE
14. PROPOSED GREASE INTERCEPTOR (SIZING PER PLUMBING PLANS)
    INV. IN = 5302.00
    INV. OUT = 5301.50
15. PROPOSED 3.00' 4" PVC @ 2.20% SANITARY SERVICE LINE
16. PROPOSED SANITARY SEWER CLEAN OUT
    INV. = 5302.06
17. PROPOSED 24.67' 4" PVC @ 3.79% SANITARY SERVICE LINE
18. PROPOSED SANITARY SEWER CLEAN OUT
    INV. = 533.00
19. PROPOSED 14.01' 4" PVC @3.79% SANITARY SERVICE LINE
20. PROPOSED SANITARY SEWER 2-WAY CLEAN OUT (RE: PLUMBING FOR CONTINUATION TO BUILDING)
    INV. = 5303.53
21. PROPOSED 64.47' @ 2.00% SANITARY DRAIN
22. PROPOSED SANITARY DRAIN
    INV. = 5303.35'
23. EXISTING 30' SANITARY SEWER AND PUBLIC WATERLINE EASEMENT (09/24/2010, 2010C-112)
24. EXISTING FIBER OPTIC LINE
25. EXISTING OVERHEAD ELECTRIC ELEMENTS
26. EXISTING TELECOM PEDESTAL
27. EXISTING SITE LIGHT
28. EXISTING GAS LINE
29. EXISTING UNDERGROUND ELECTRIC LINE
30. EXISTING TRANSFORMER
31. EXISTING PULL BOX
32. EXISTING 10' PUBLIC UTILITY EASEMENT (08/08/1990, 90C-182)
33. PROPOSED GAS SERVICE LINE
34. PROPOSED ELECTRIC SERVICE LINE
35. PROPOSED ELECTRIC TRANSFORMER
36. PROPOSED 1"Ø CONDUIT FIBER OPTIC SERVICE LINE AND 2"Ø CONDUIT TELEPHONE SERVICE LINE
37. PROPOSED SITE LIGHT
38. EXISTING WATER MAIN
39. EXISTING SANITARY SEWER MAIN
40. EXISTING WATER SERVICE STUB
41. EXISTING 15' PUBLIC WATERLINE EASEMENT (09/24/2010, 2010C-112)

N

0' 20' 40' 60'
SCALE 1" = 20'