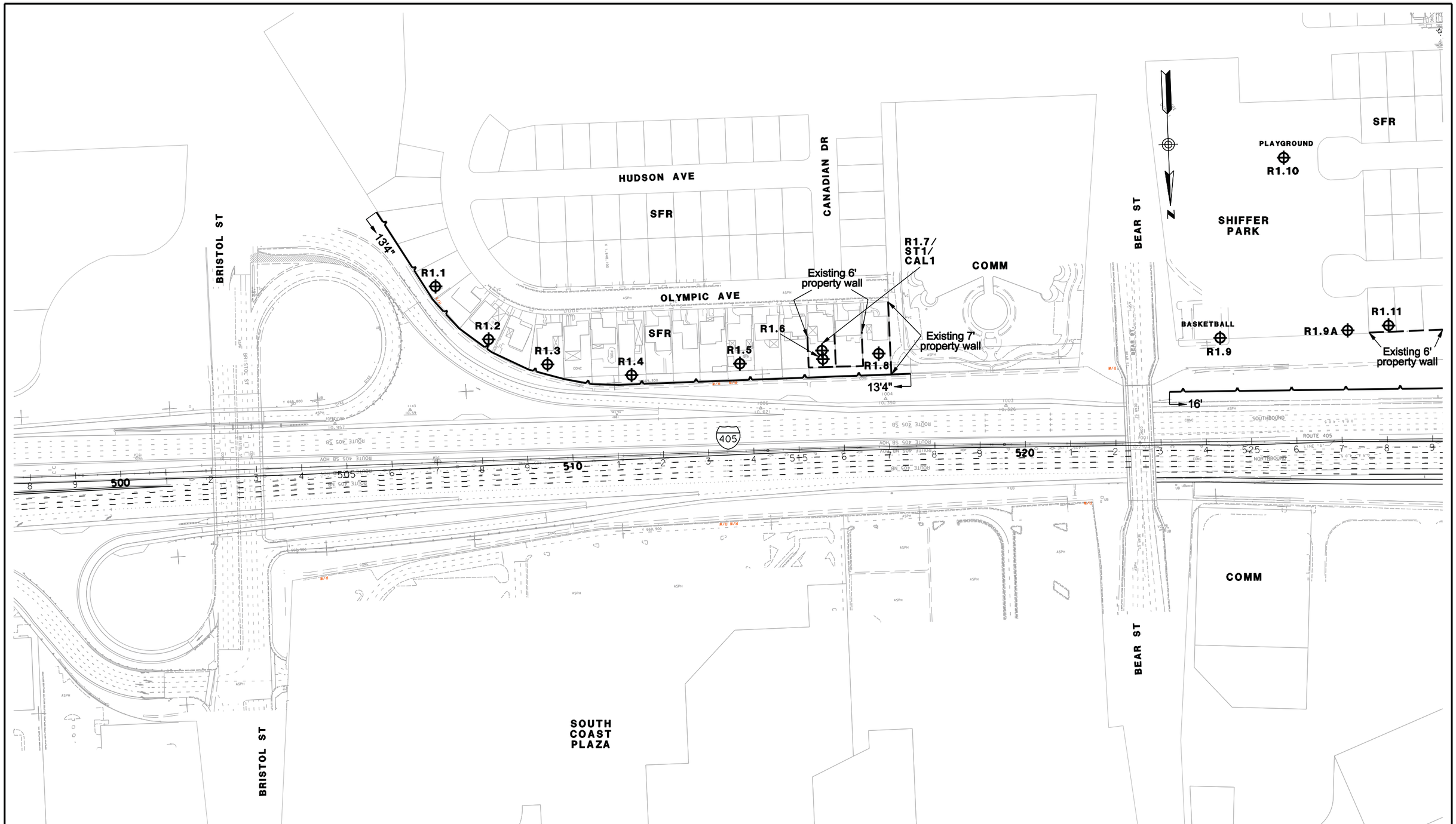

LEGEND

- RXX – RECEIVER SITE
- LT – LONGTERM MEASUREMENT
- ST – SHORTTERM MEASUREMENT
- CAL – CALIBRATION SITE
- EXISTING WALL
- SOUNDWALL
- EXISTING SOUNDWALL
- REPLACEMENT IN KIND SOUNDWALL
- SFR – SINGLE FAMILY RESIDENCE
- MFR – MULTI–FAMILY RESIDENCE
- COMM – COMMERCIAL
- b – BENEFITED RESIDENCE

1in : 200ft

0 ft 100ft 200ft 300ft

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I-405 WIDENING PA/ED PROJECT NADR RECOMMENDED BARRIER HEIGHTS & LOCATIONS ALT3

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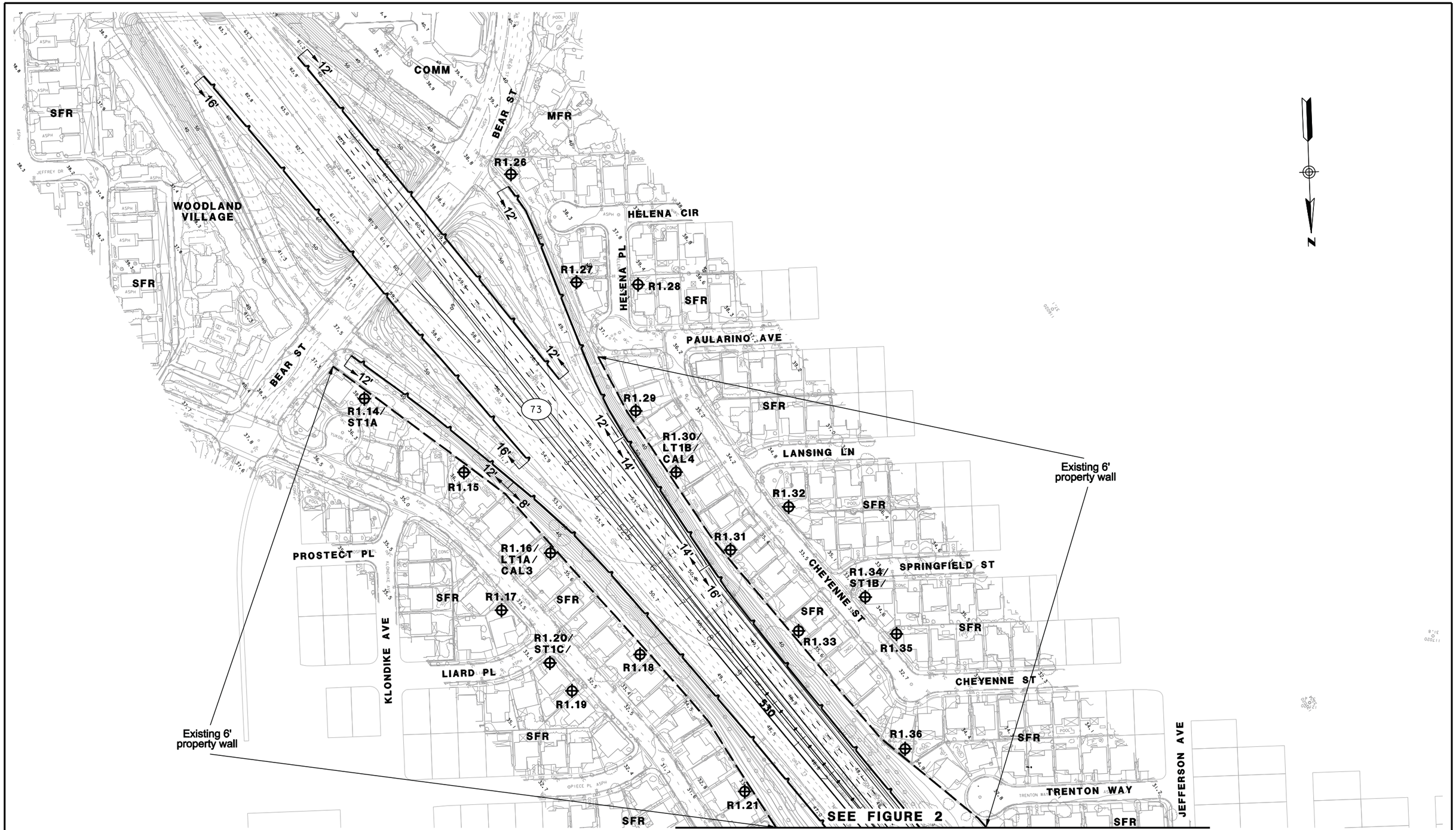
FIGURE 1



LEGEND

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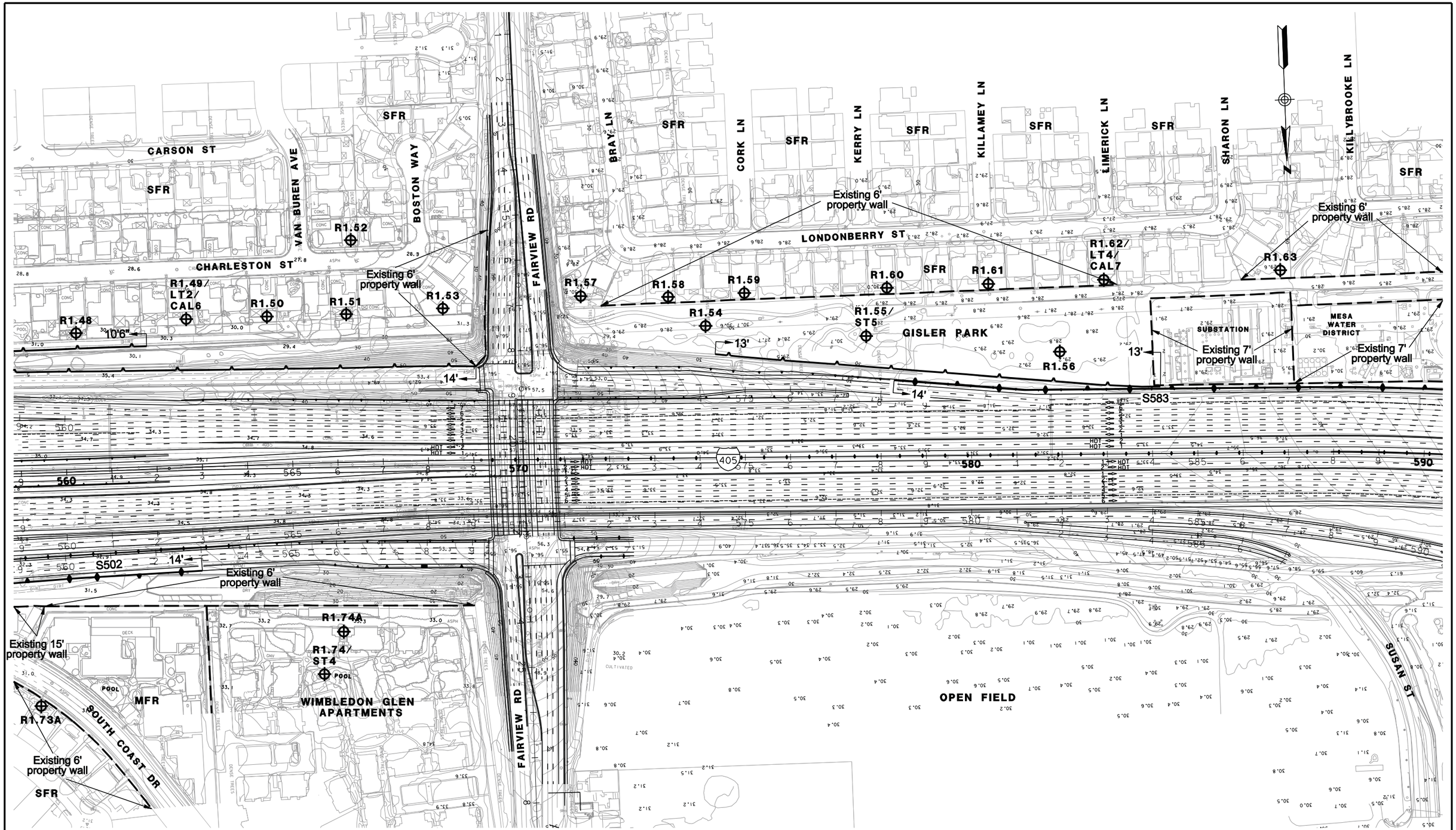
FIGURE 2A



LEGEND

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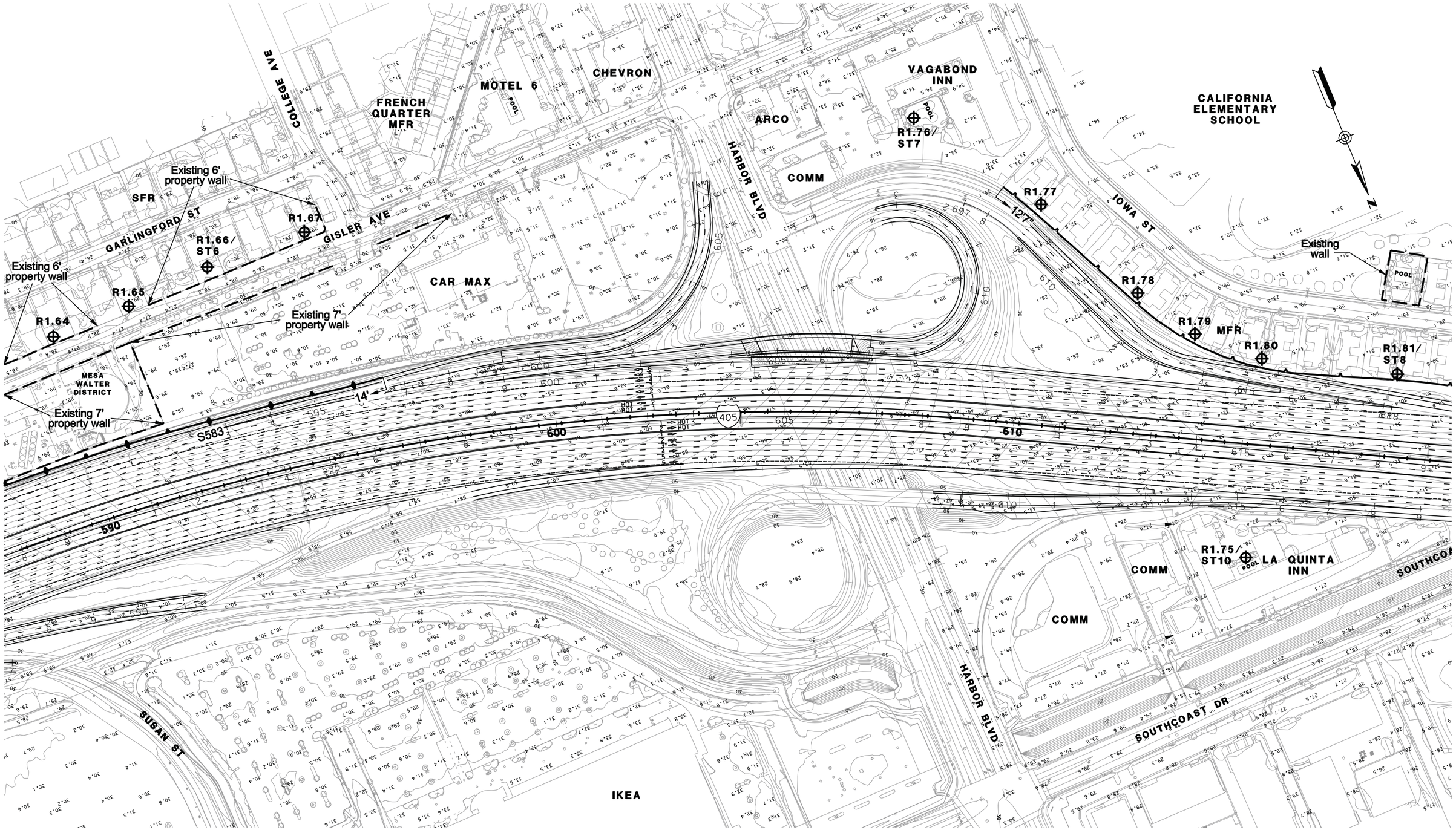
FIGURE 3



LEGEND

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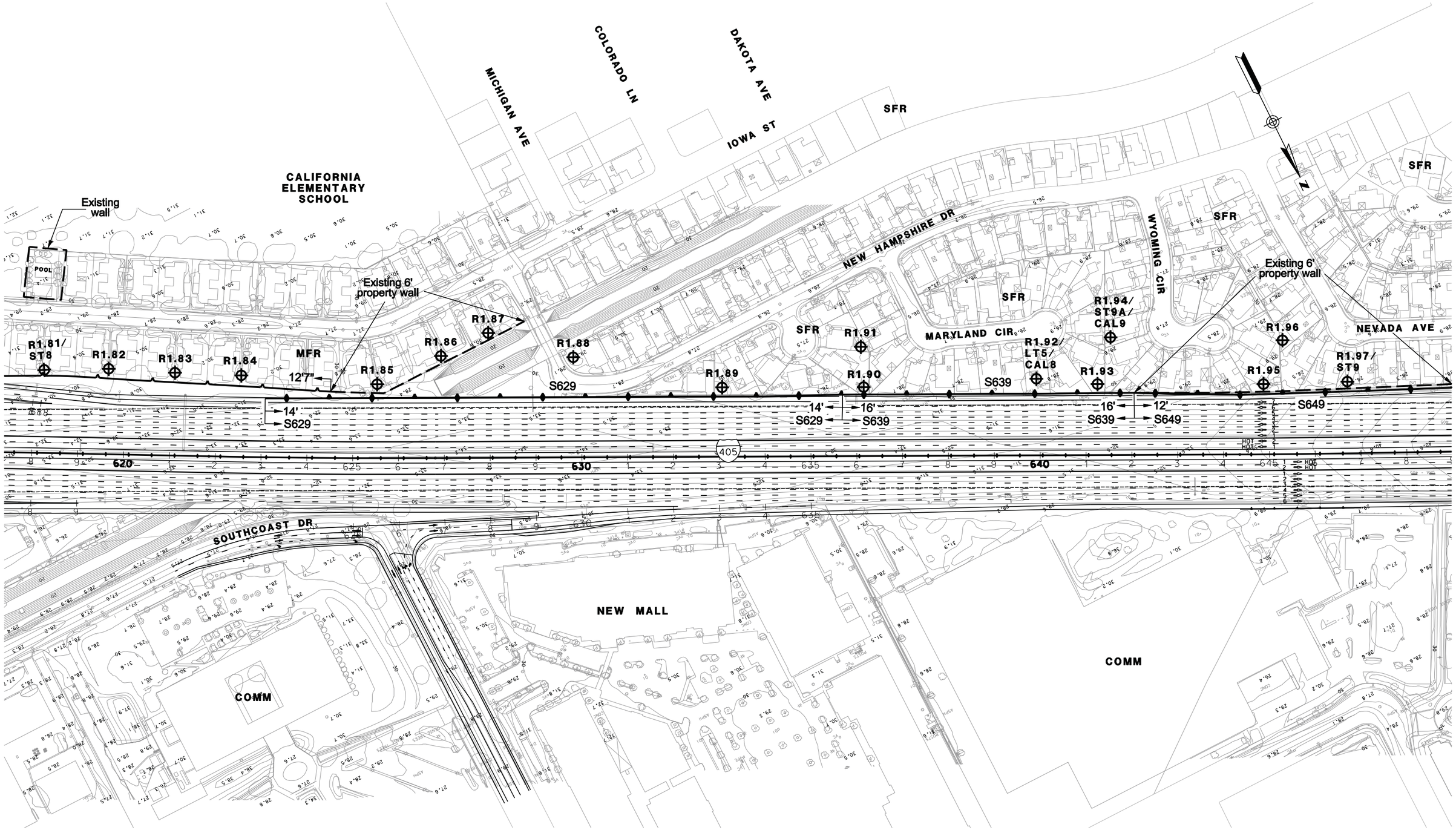
FIGURE 4



LEGEND

- RXX – RECEIVER SITE
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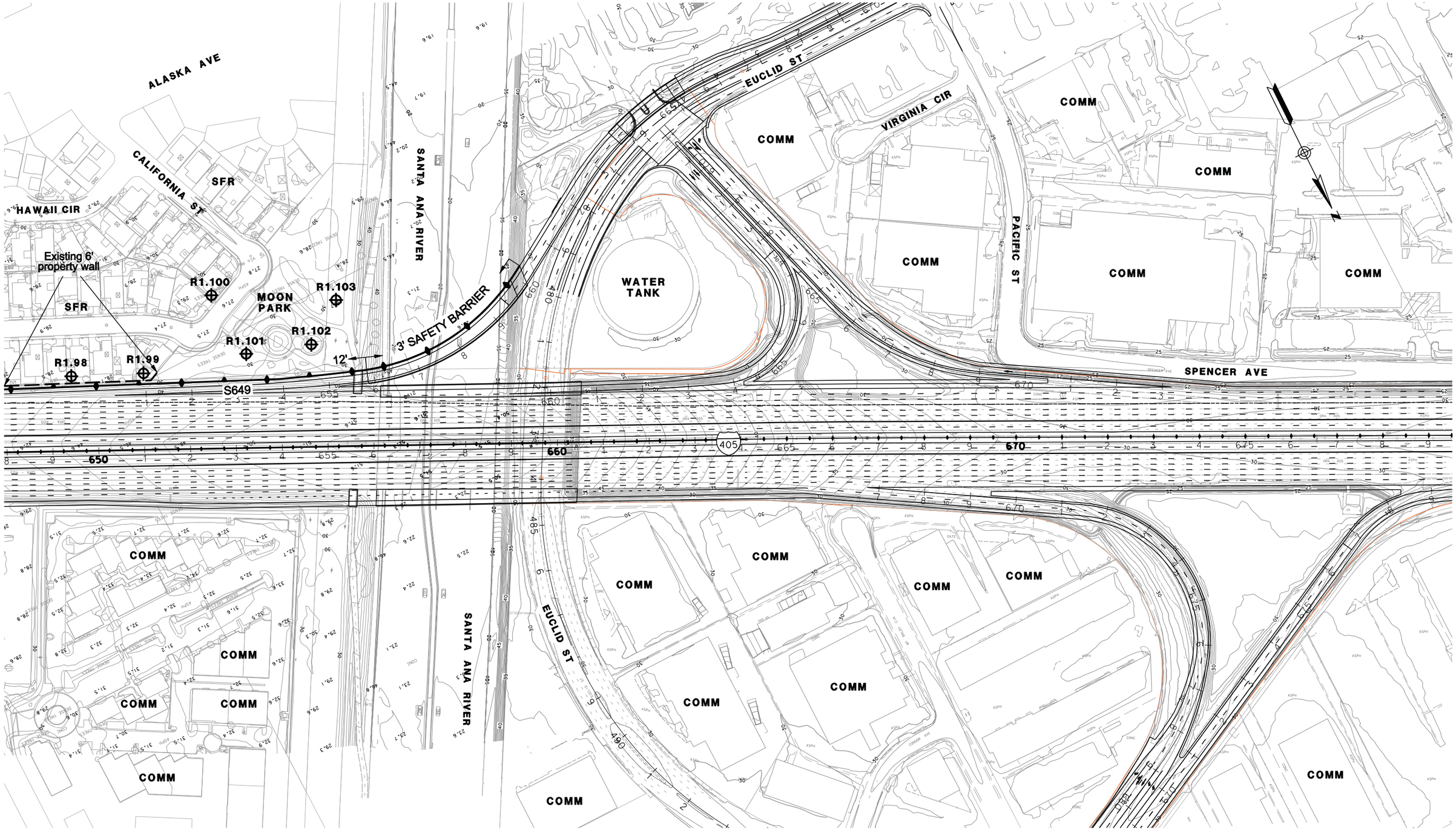
FIGURE 5



LEGEND

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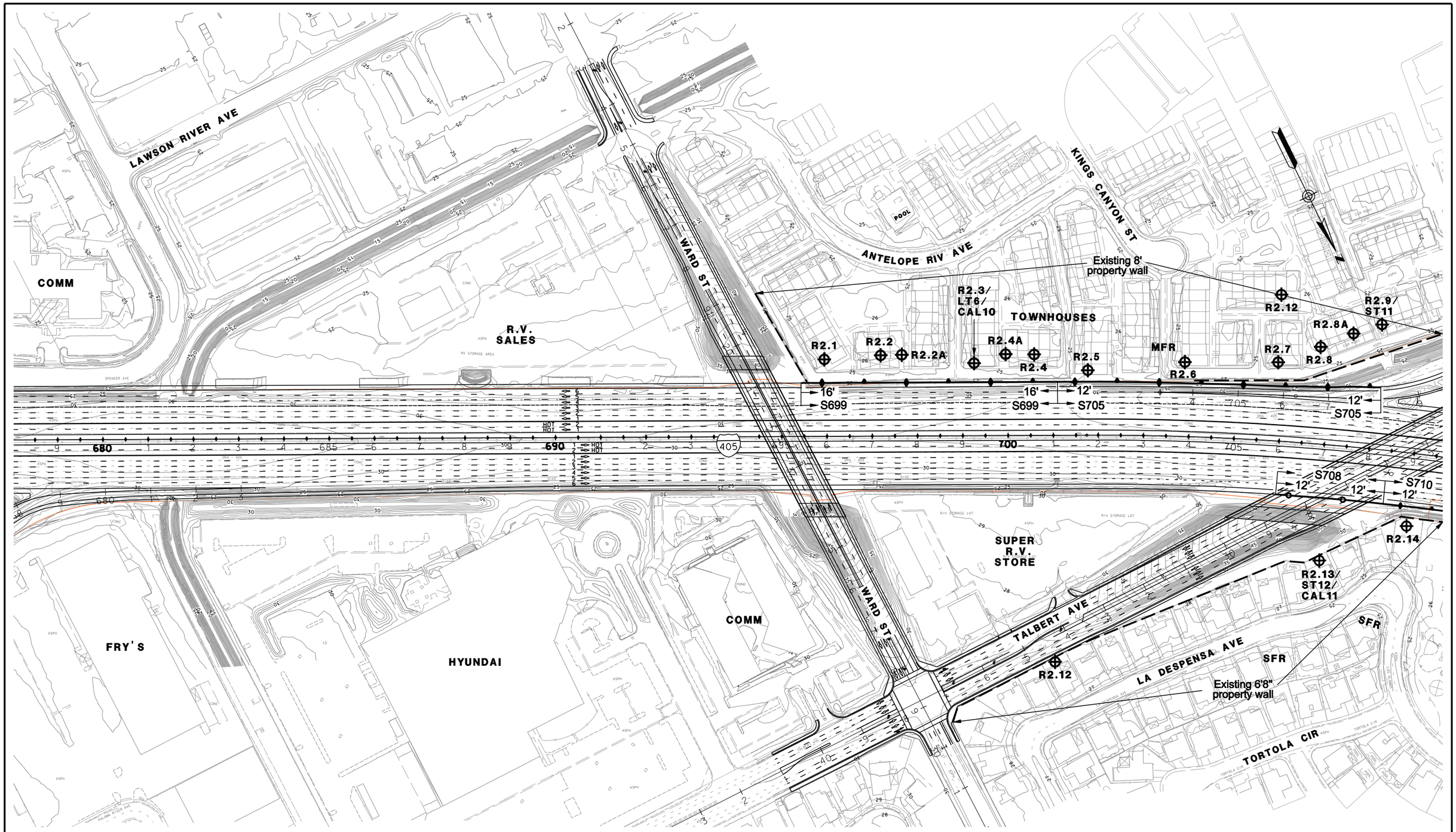
FIGURE 6



LEGEND

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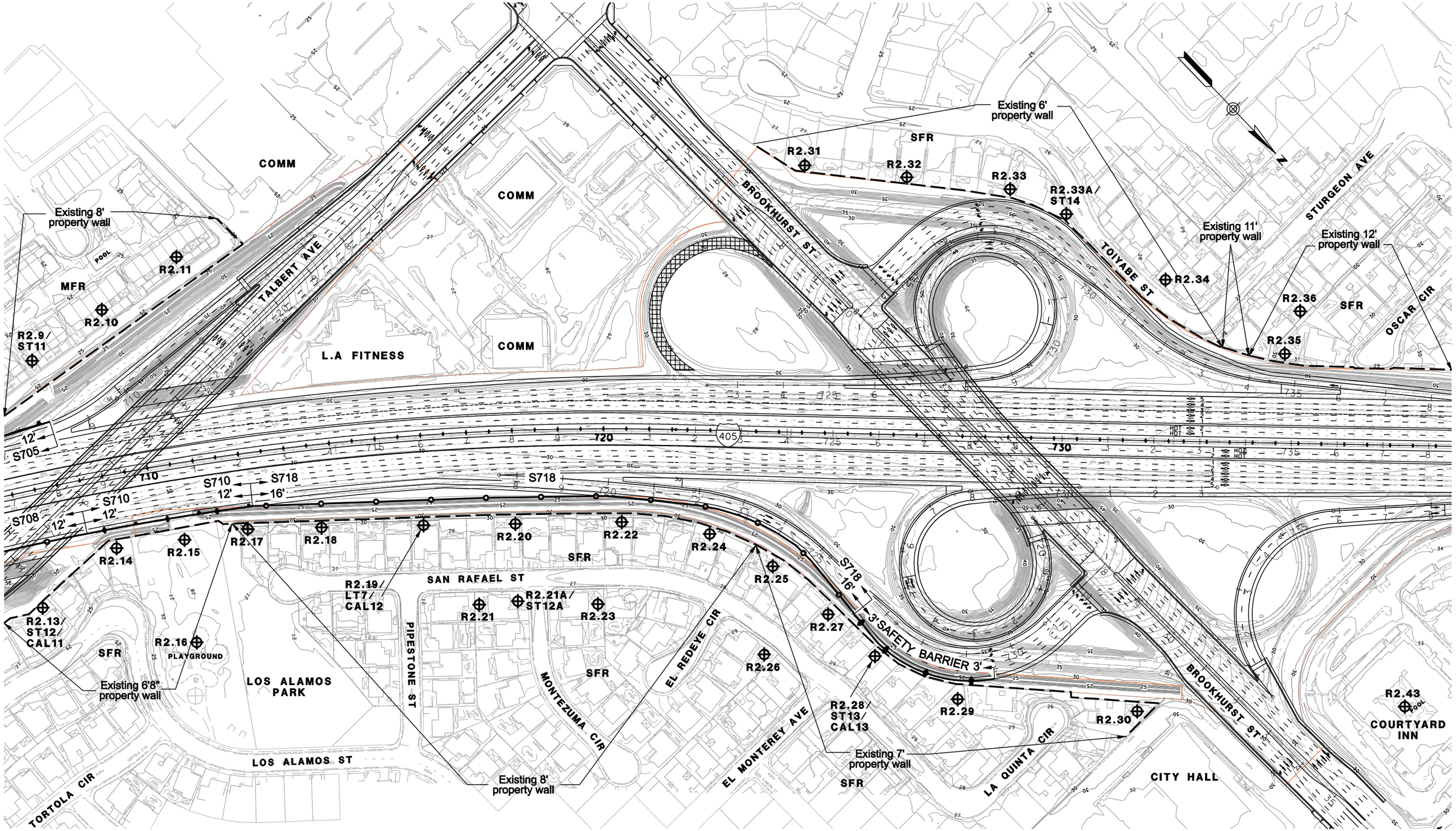
FIGURE 7



LEGEND

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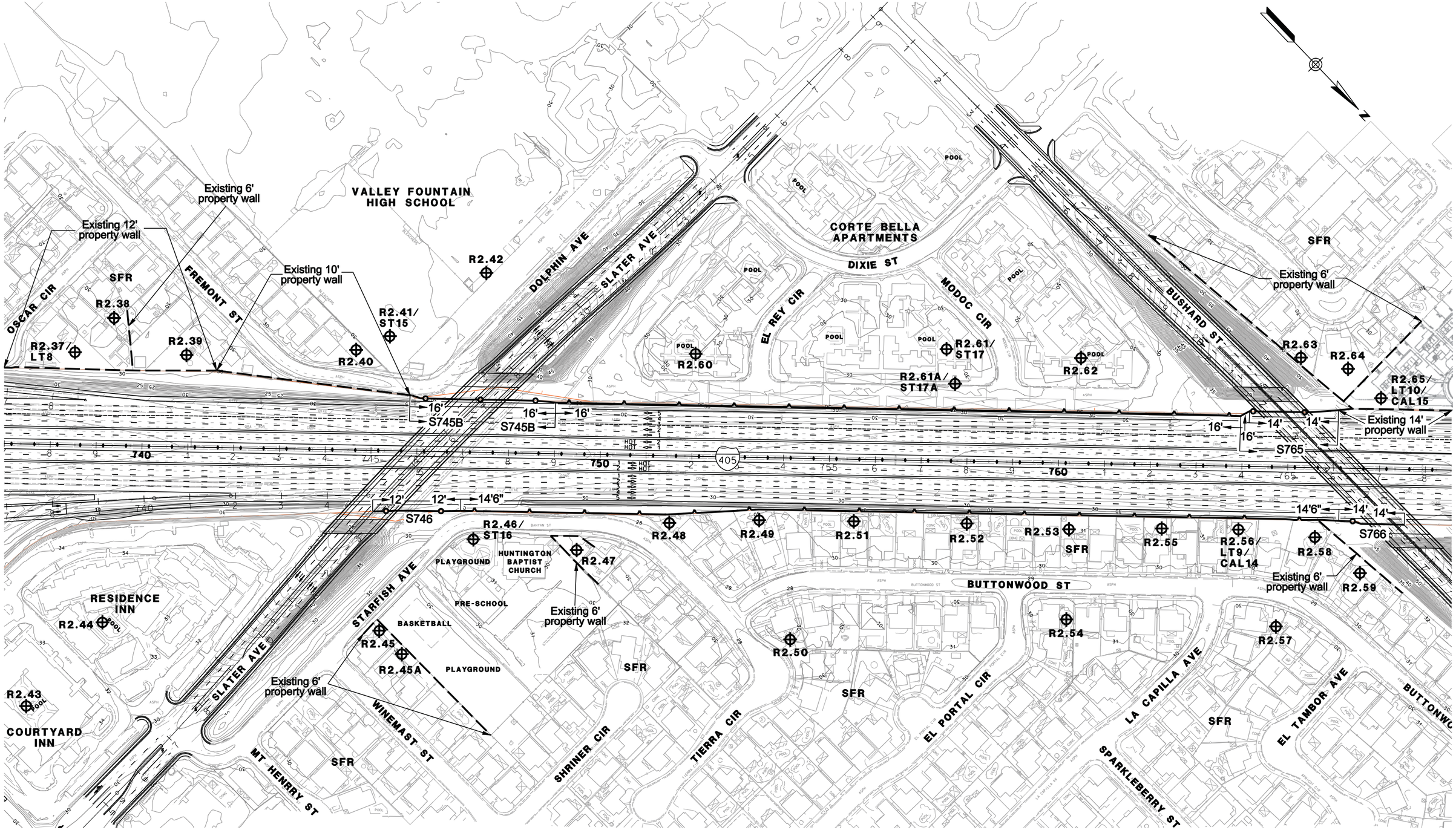
FIGURE 8



LEGEND

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FIGURE 9

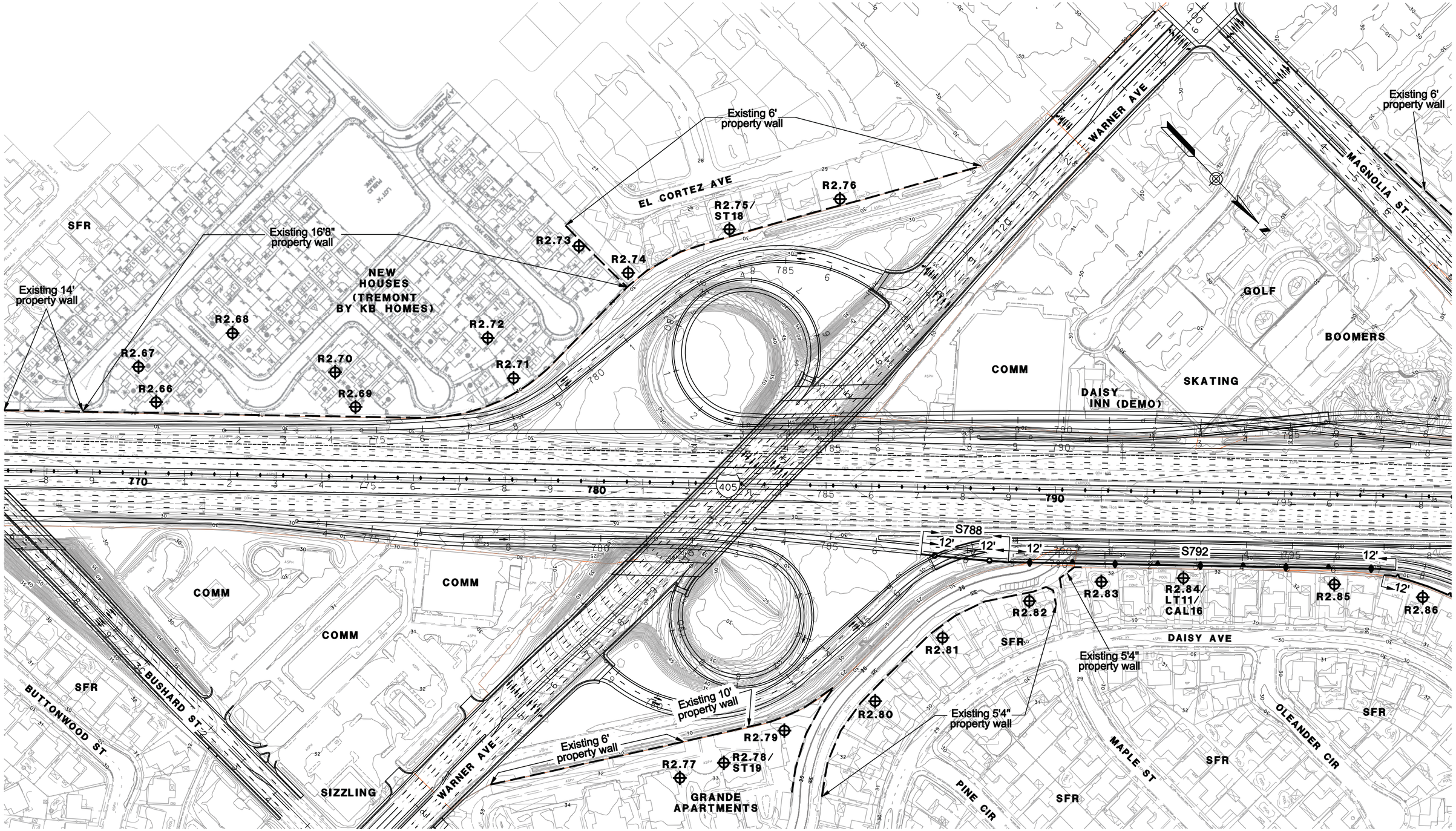

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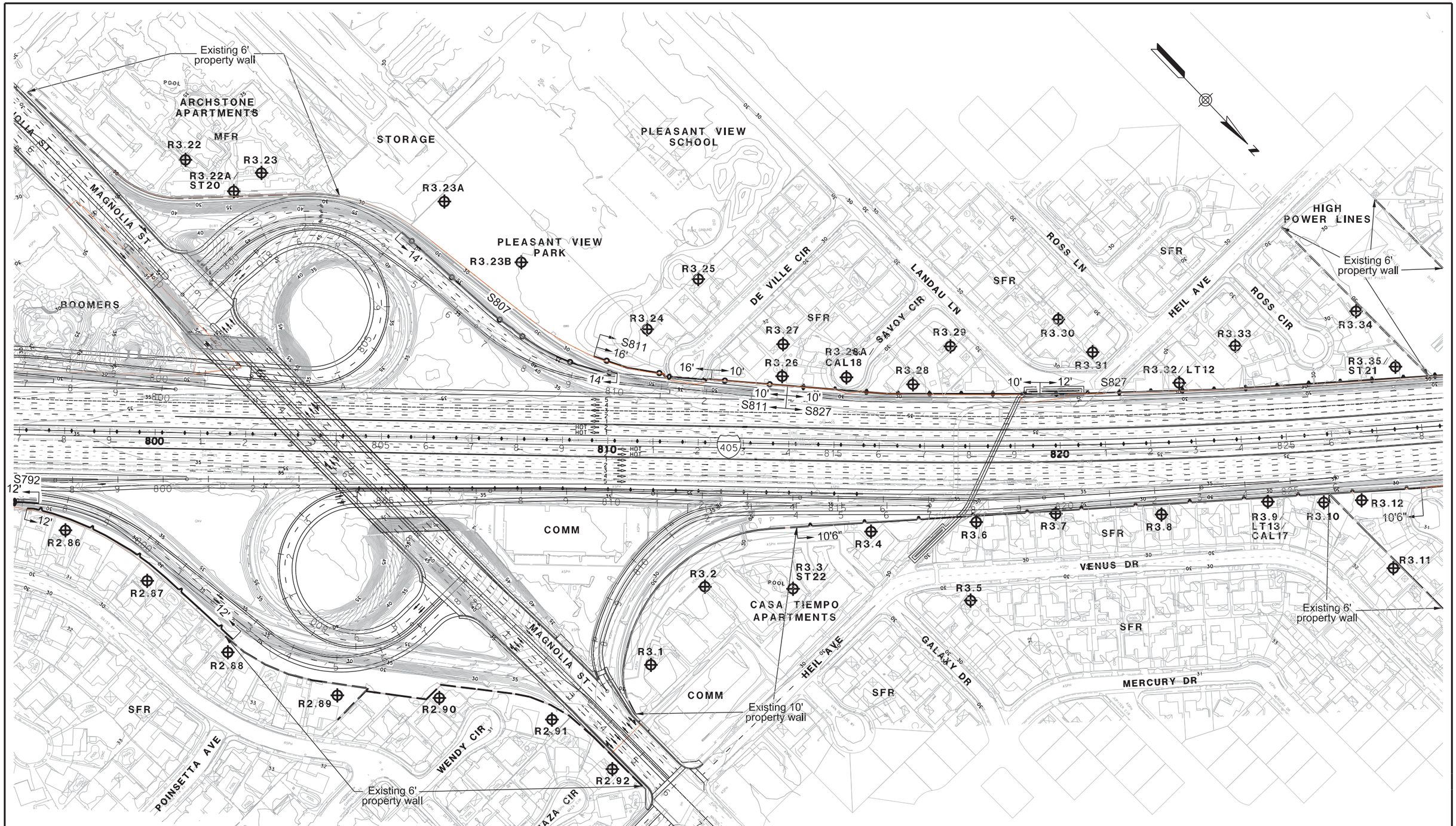
FIGURE 10



LEGEND

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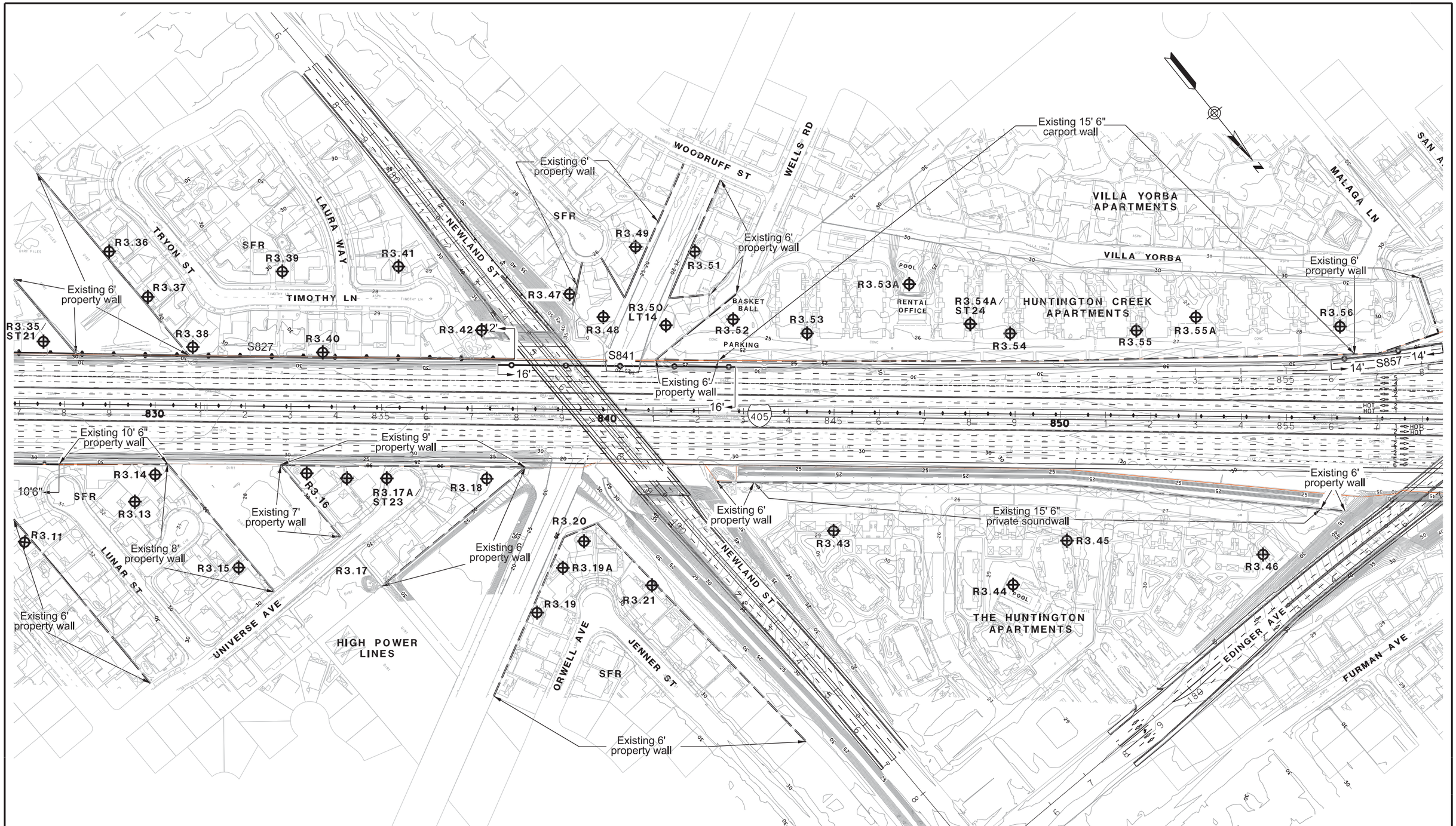
FIGURE 11



LEGEND

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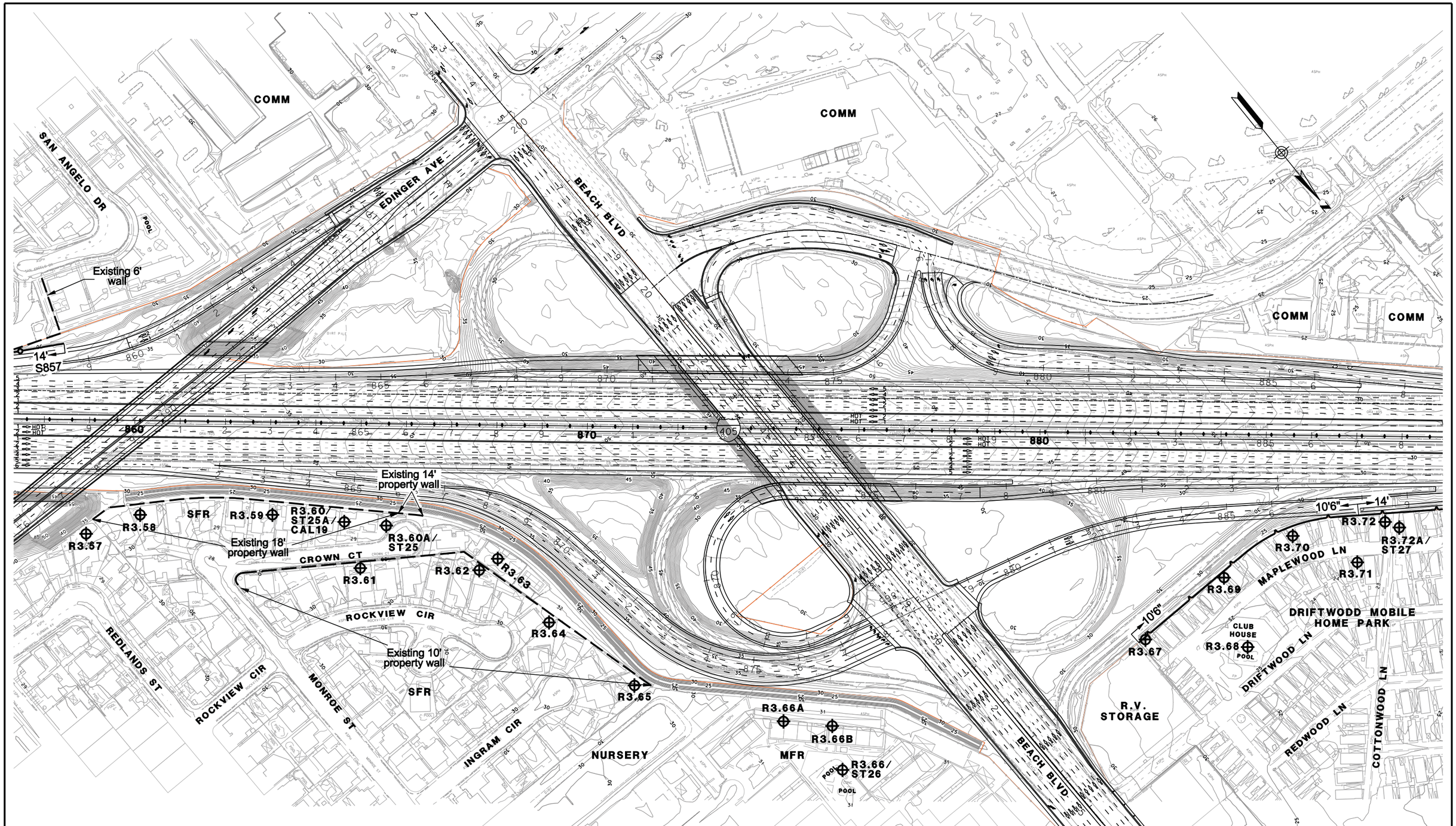
FIGURE 12



LEGEND

- RXX – RECEIVER SITE
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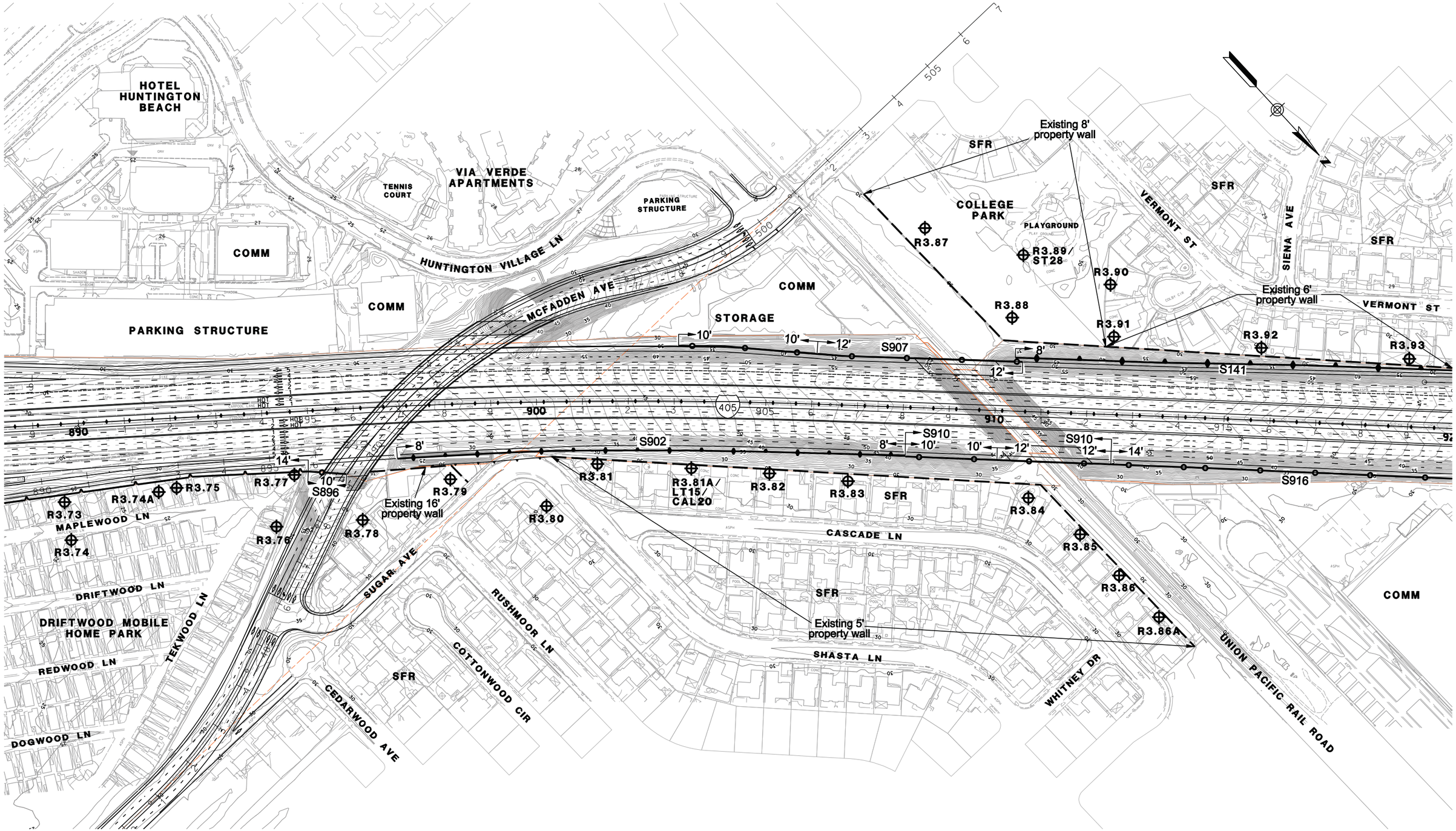
FIGURE 13



LEGEND

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FIGURE 14

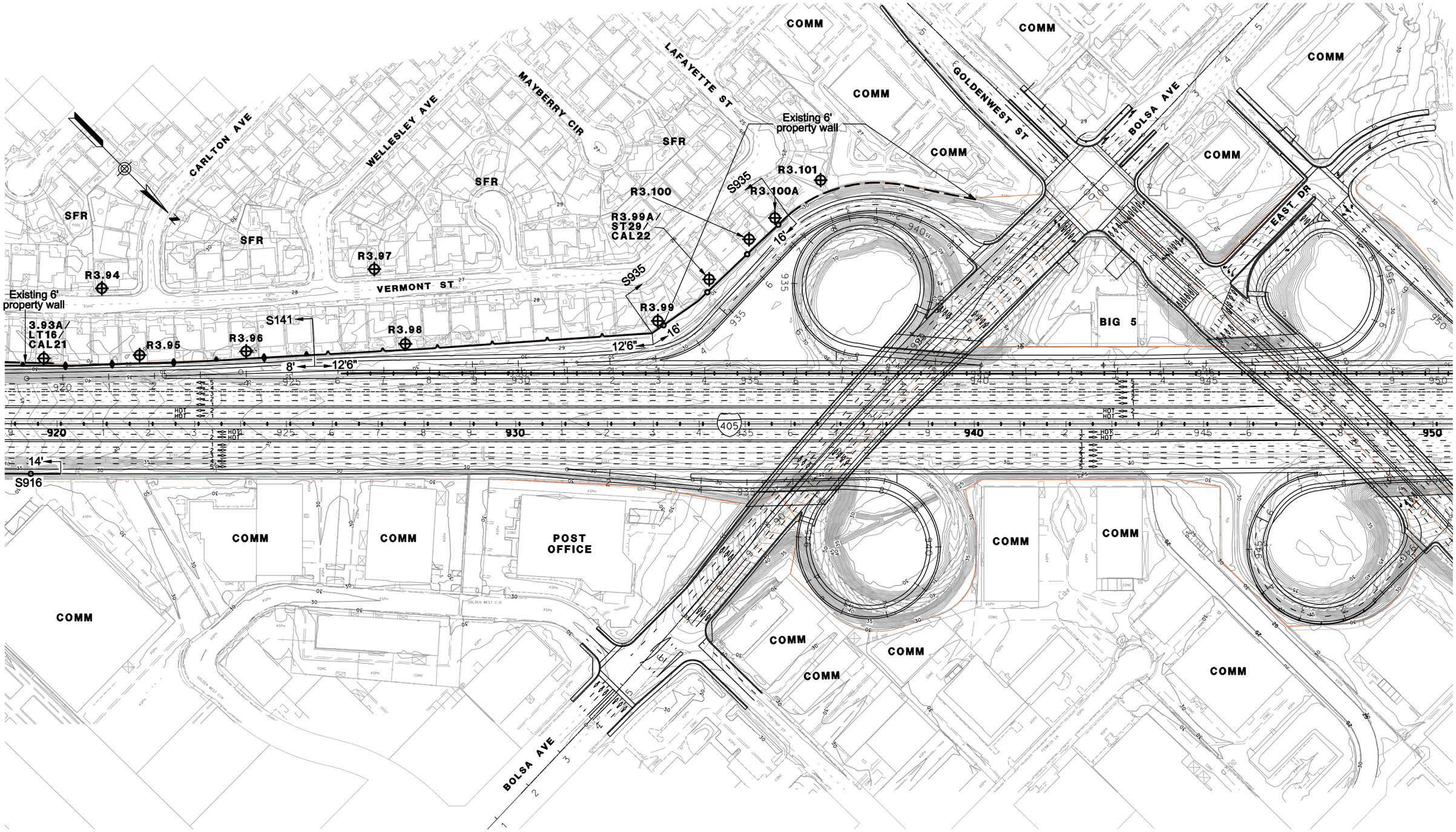

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FIGURE 15

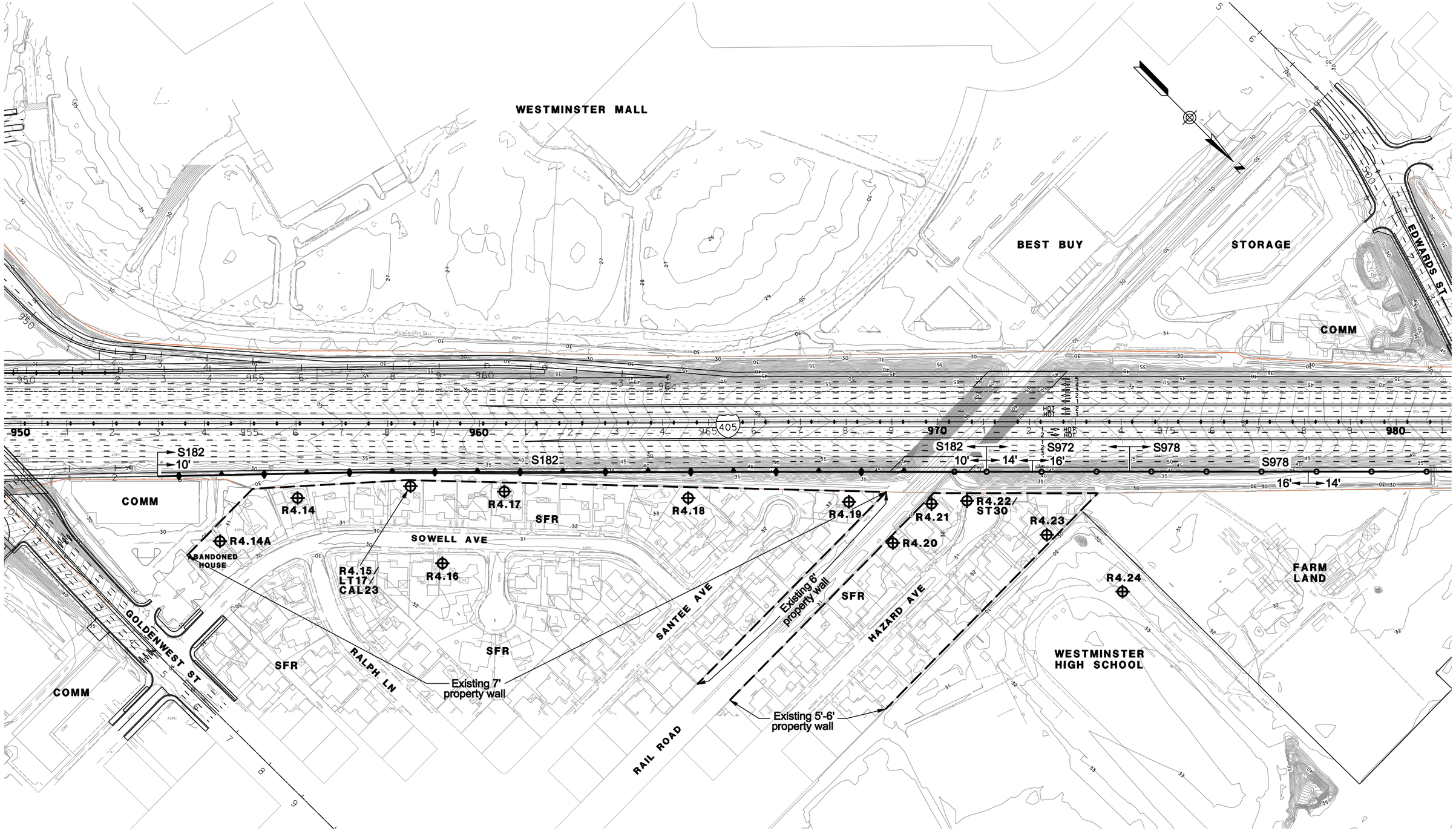

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FIGURE 16

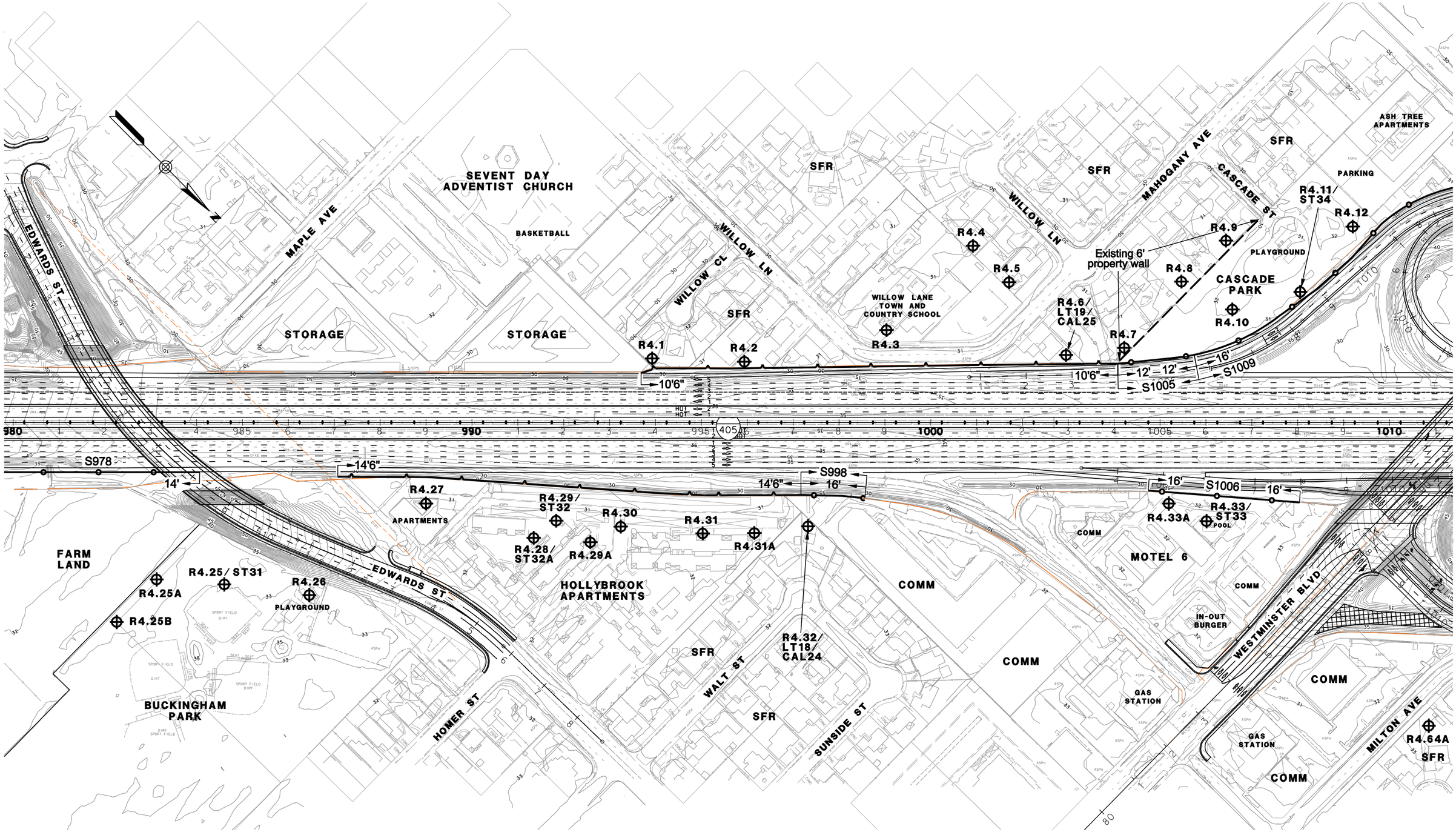

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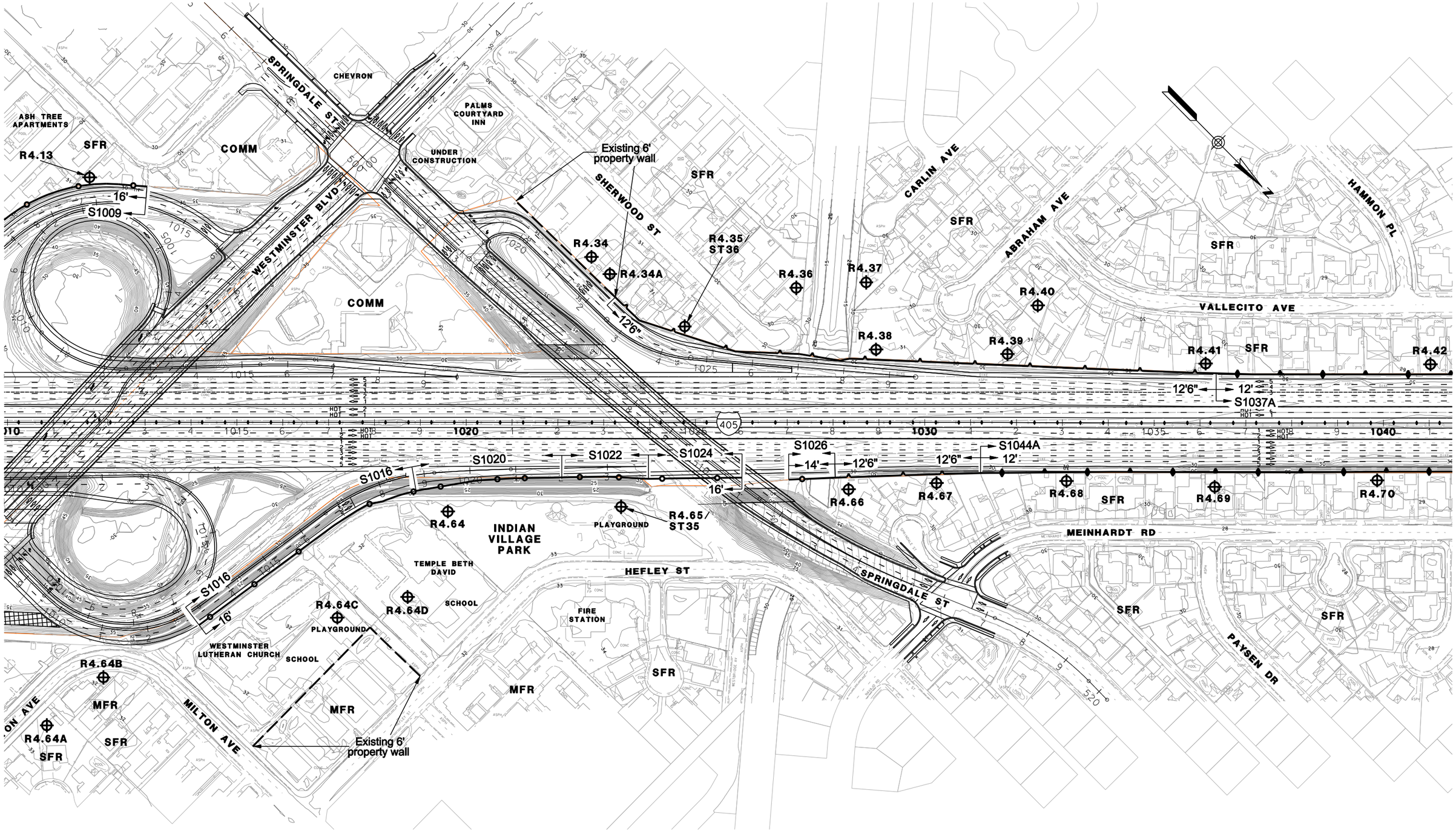
FIGURE 17



LEGEND

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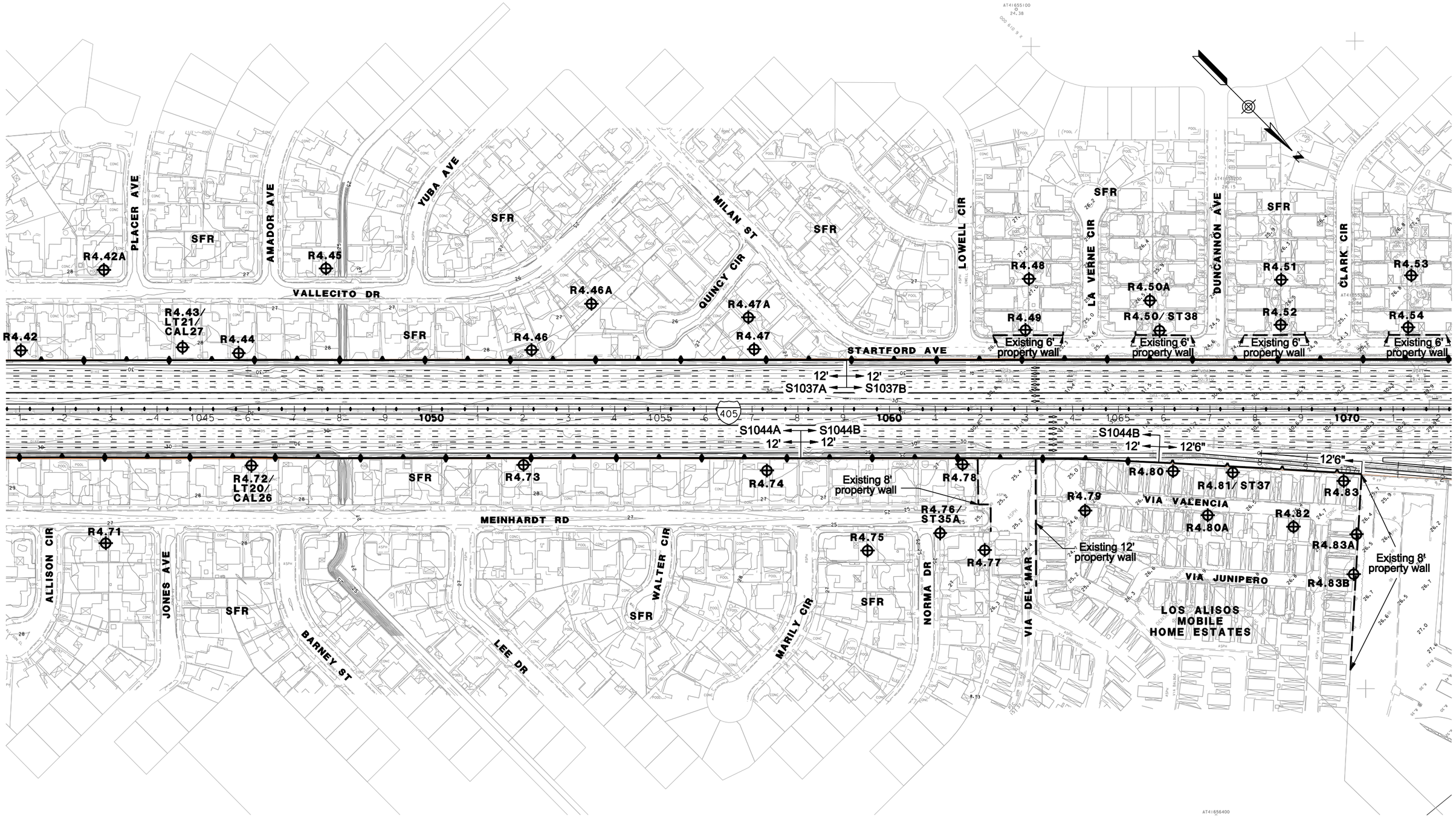
FIGURE 18



LEGEND

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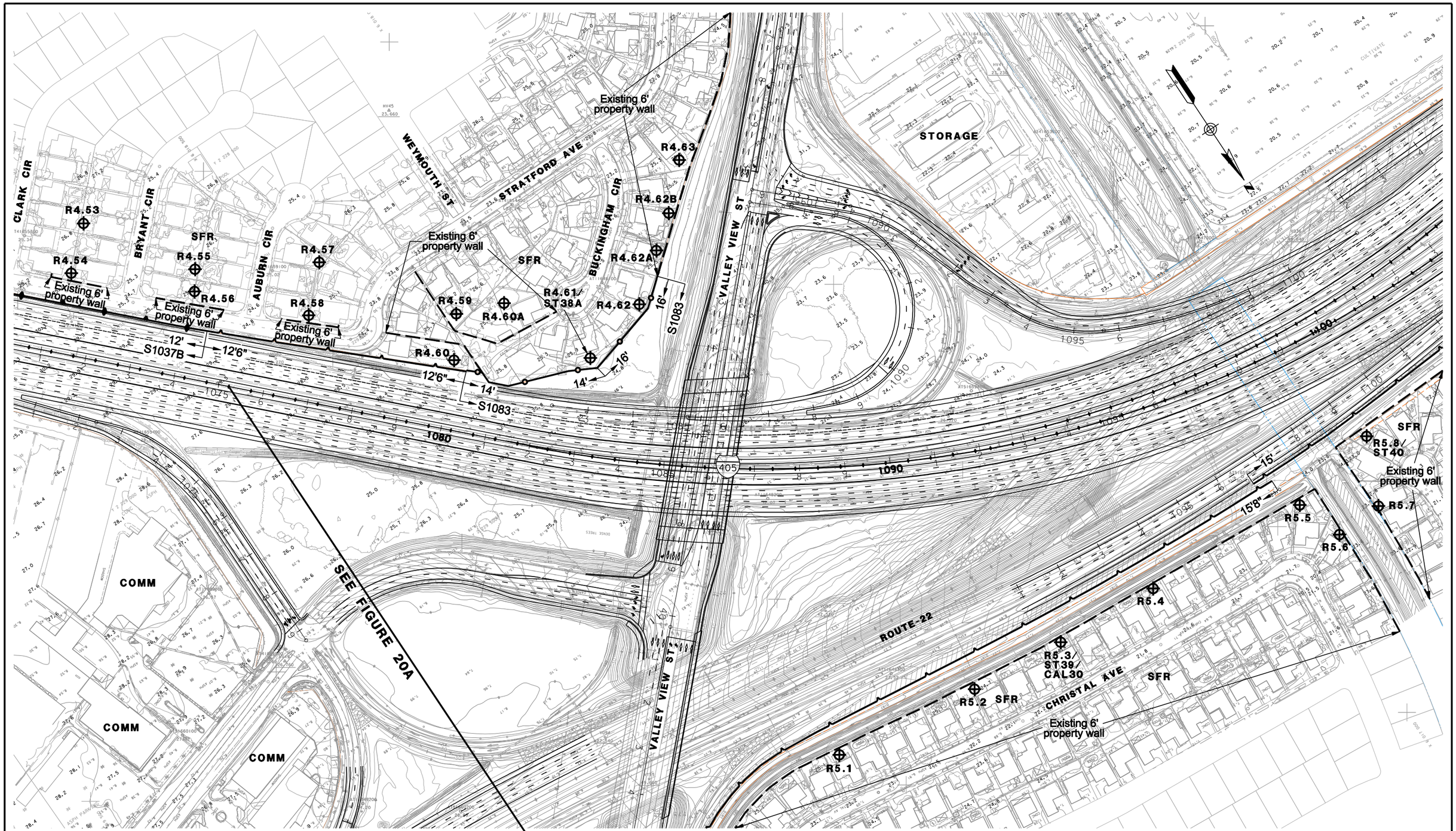
FIGURE 19



LEGEND

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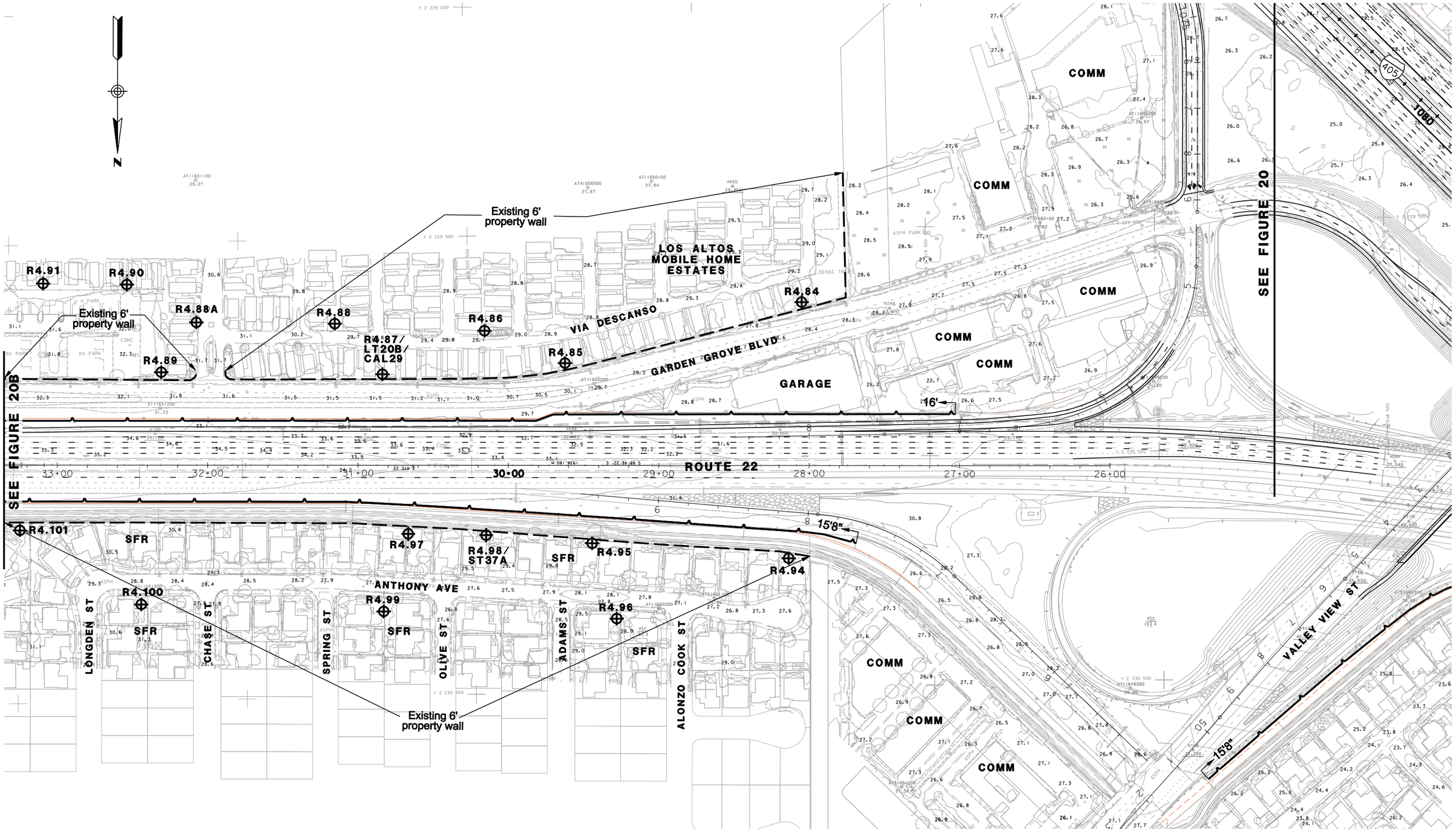
FIGURE 20



LEGEND

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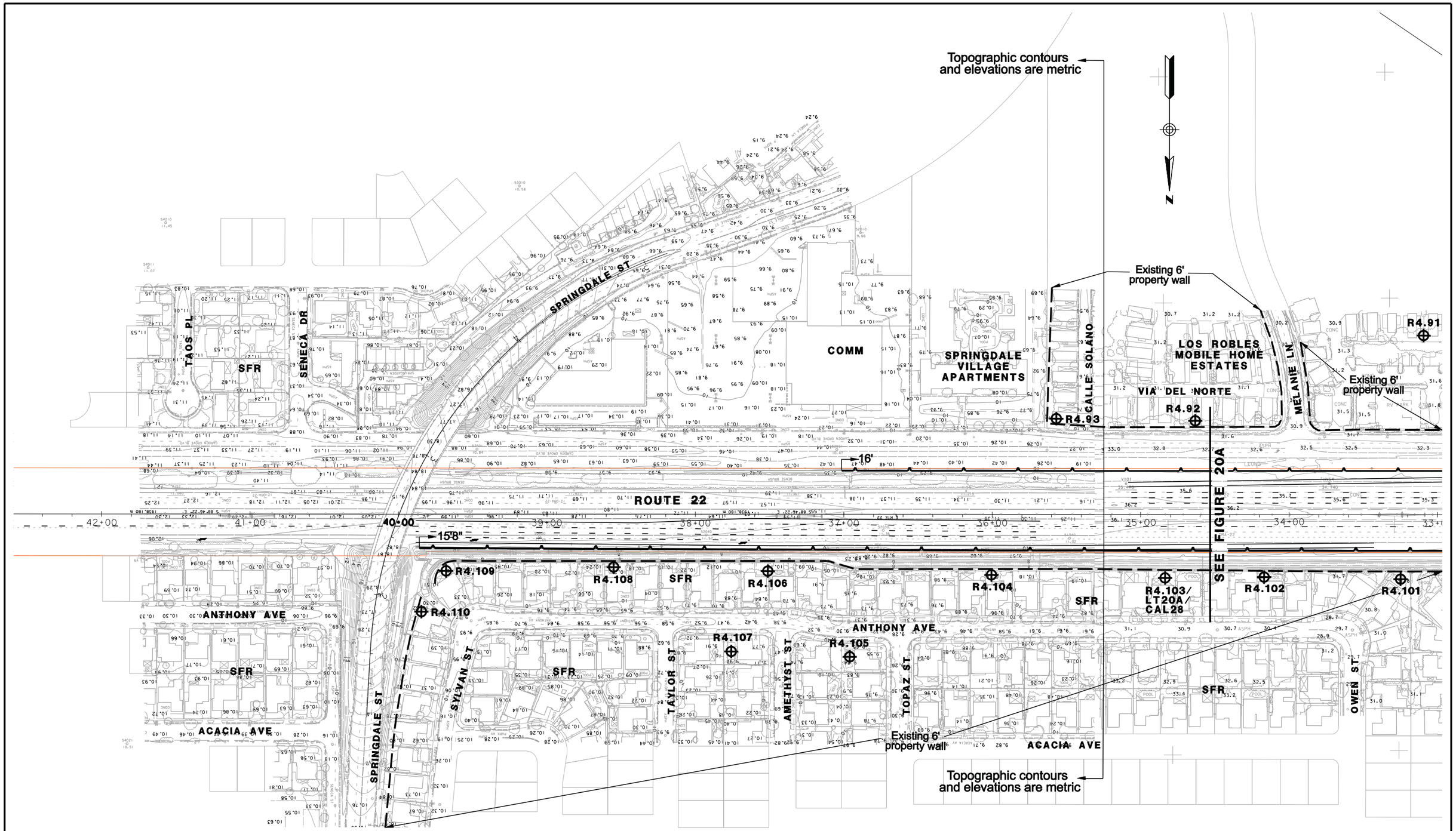
FIGURE 20A



LEGEND

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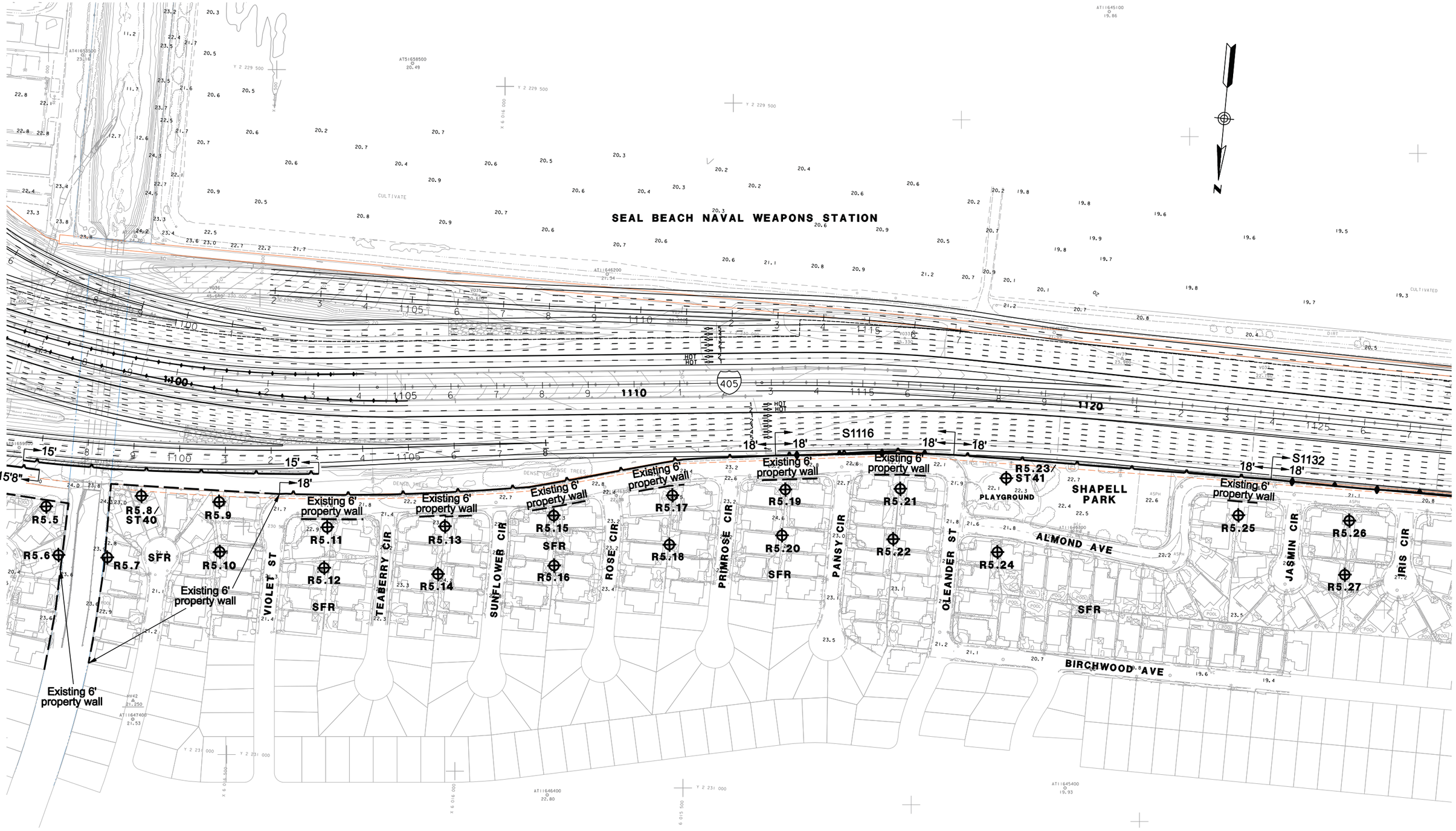
FIGURE 20B



LEGEND

- RXX – RECEIVER SITE
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- ST – SHORTTERM MEASUREMENT
- CAL – CALIBRATION SITE
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- SOUNDWALL
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- REPLACEMENT IN KIND SOUNDWALL
- SFR – SINGLE FAMILY RESIDENCE
- MFR – MULTI-FAMILY RESIDENCE
- COMM – COMMERCIAL
- b – BENEFITED RESIDENCE

1in : 200ft

0 ft 100ft 200ft 300ft

PARSONS
100 WEST WALNUT ST.
PASADENA, CA 91124
(626) 440-6100

I-405 WIDENING PA/ED PROJECT NADR RECOMMENDED BARRIER HEIGHTS & LOCATIONS ALT3

FEBRUARY 25, 2011

FIGURE 21

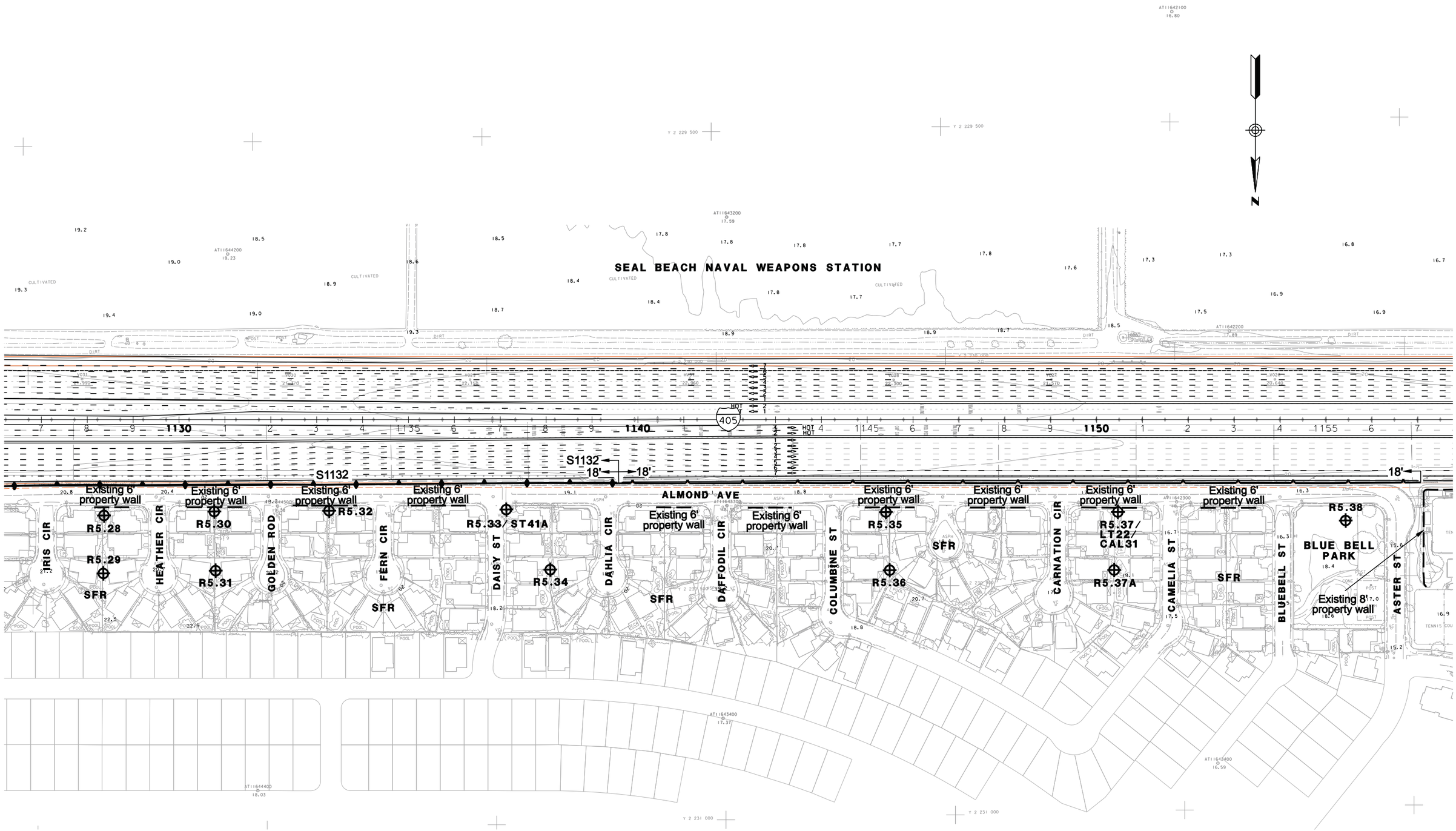

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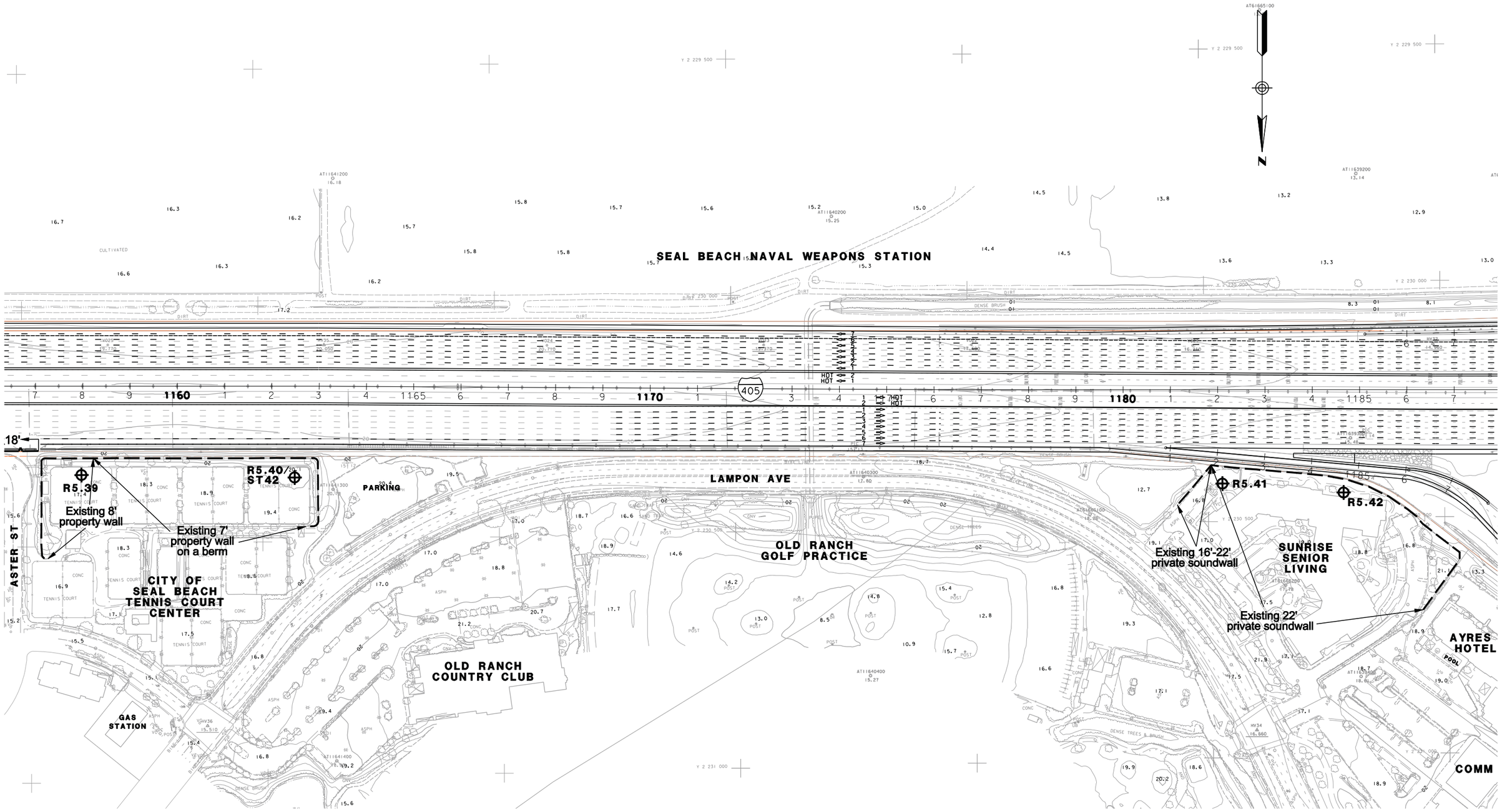
FIGURE 22



LEGEND

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FIGURE 23

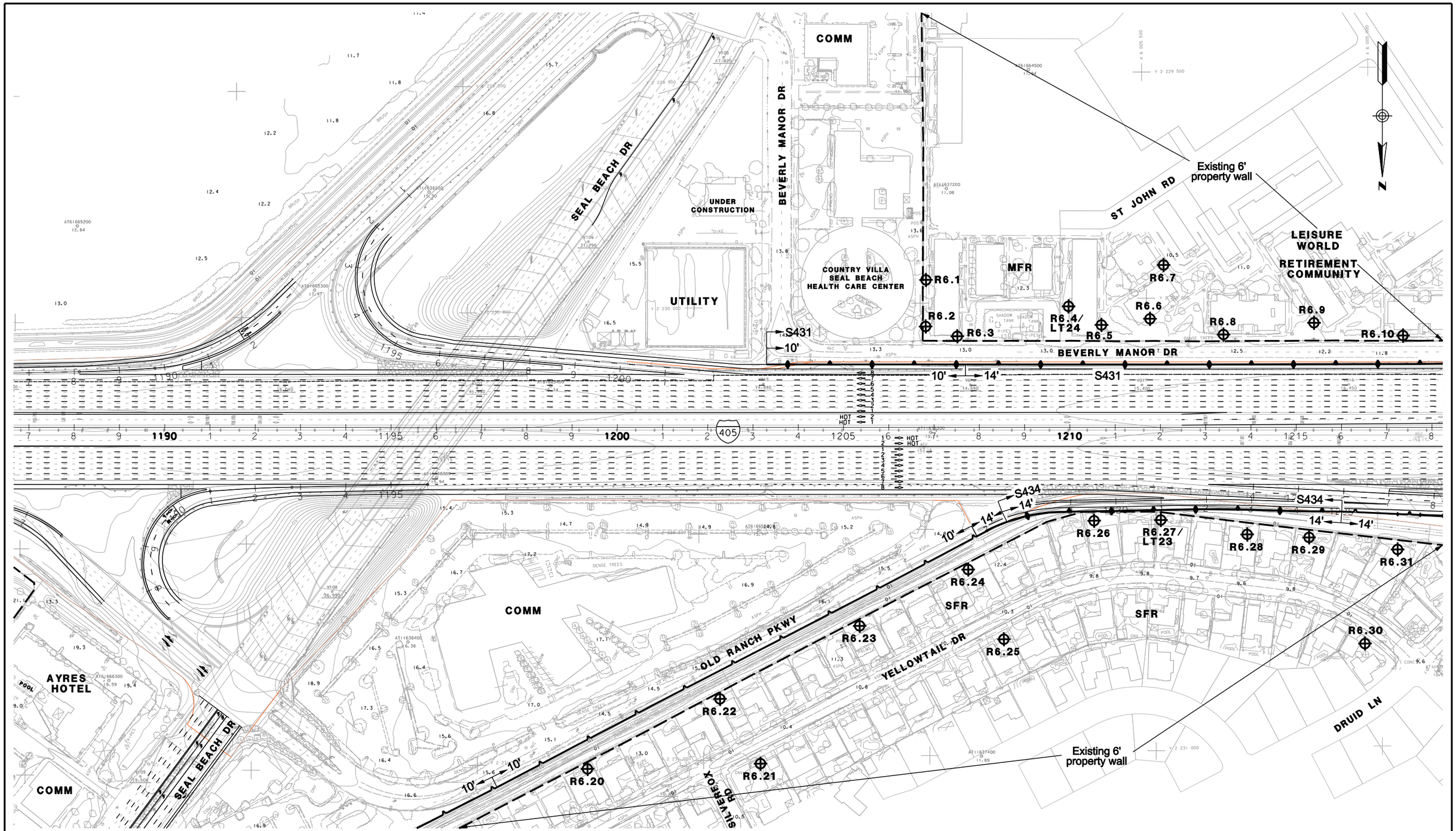

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FIGURE 24

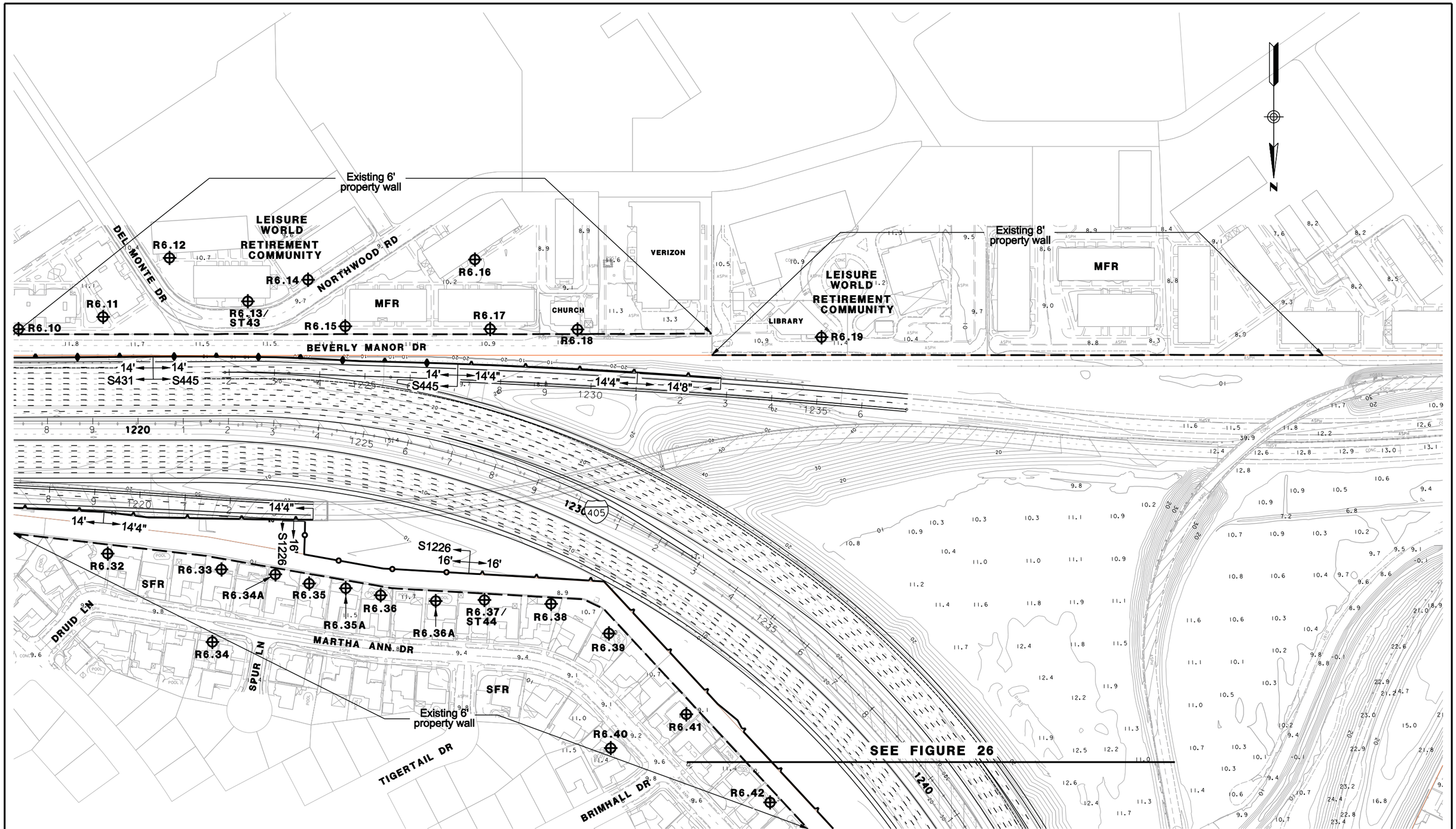

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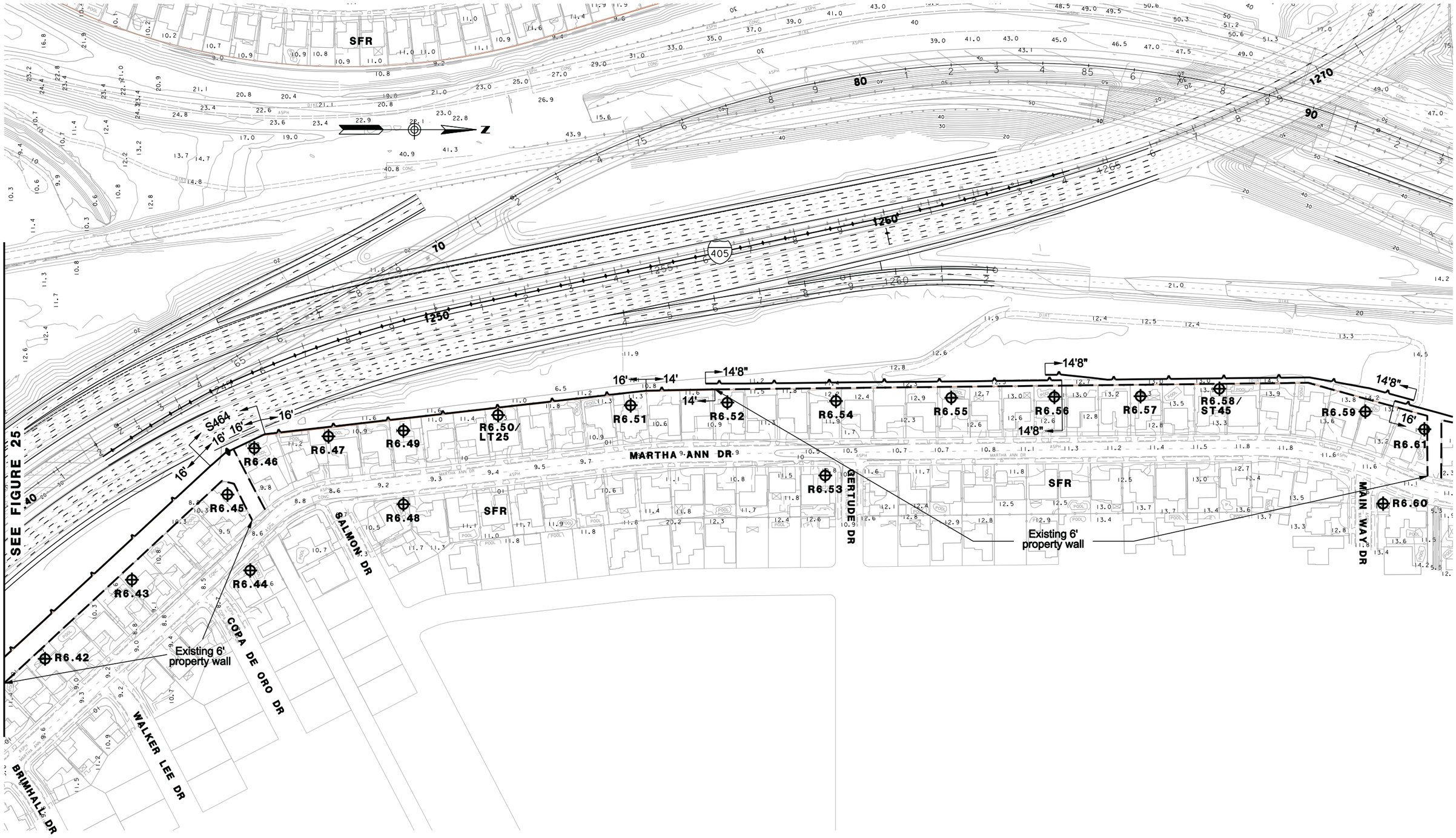
FIGURE 25



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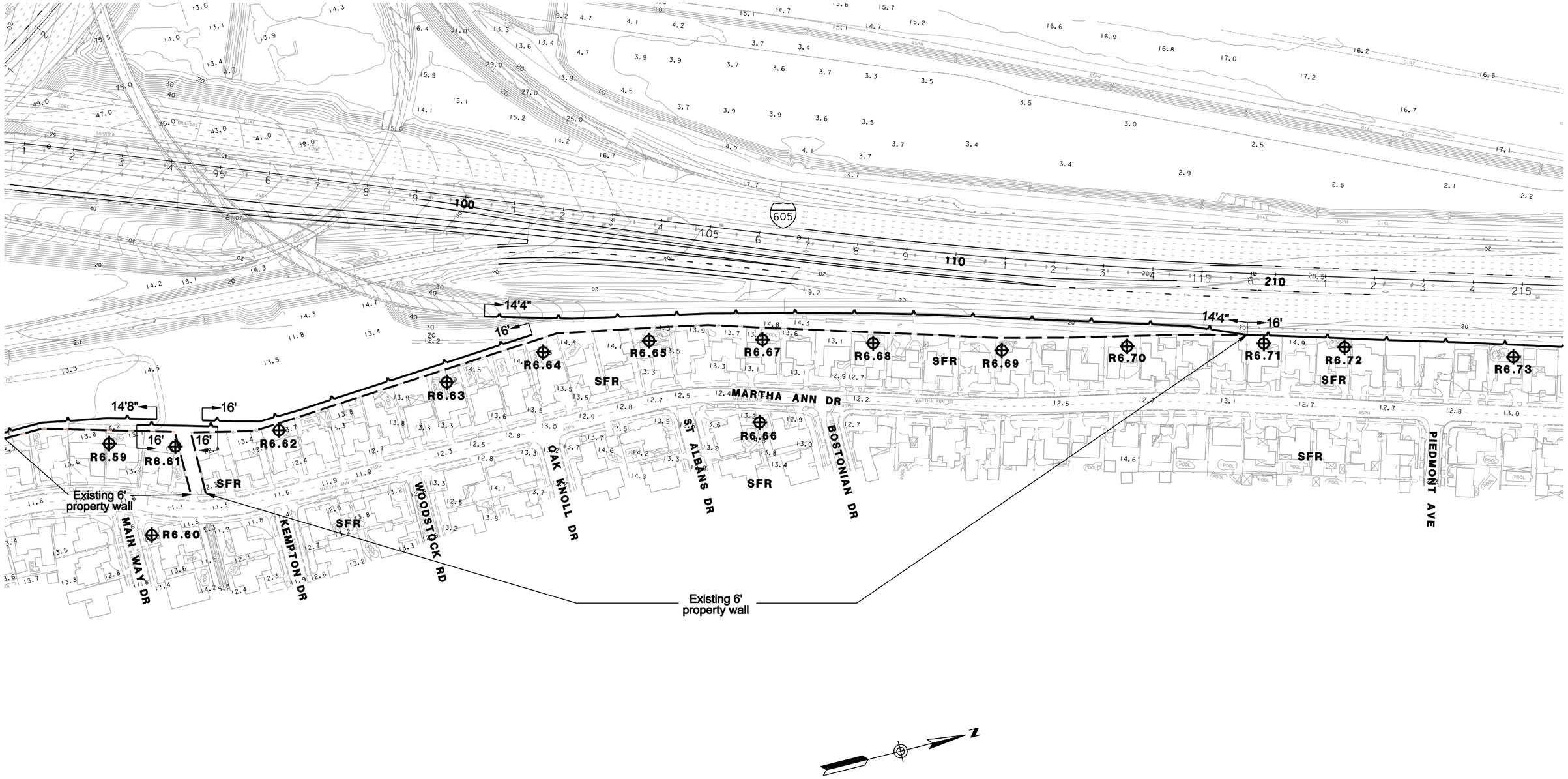
FEBRUARY 25, 2011

FIGURE 26



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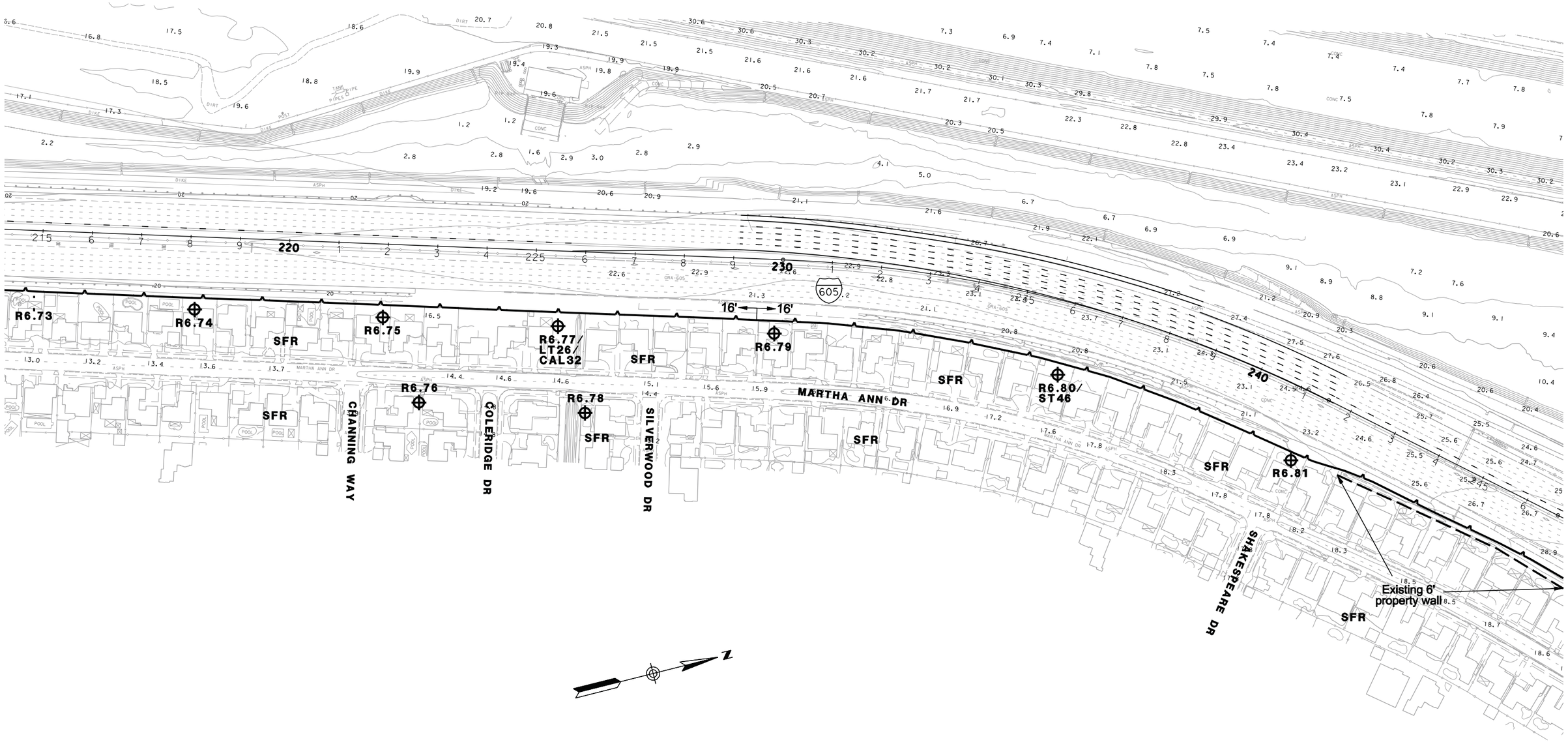
FEBRUARY 25, 2011

FIGURE 27



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FEBRUARY 25, 2011

FIGURE 28

Appendix B Cost Analysis

Cost Estimate for Barrier S708 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	25	25	25	25	25
Piles Length (ft)	238	263	288	313	325
Pile cost (Drill & Cast) [$50/LF]	$11,875.00	$13,125.00	$14,375.00	$15,625.00	$16,250.00
Sound Wall Area (SQFT)	1272	1752	2232	2712	3192
Masonry Cost[2] [$13/SQFT]	$16,536.00	$22,776.00	$29,016.00	$35,256.00	$41,496.00
Pile Volume (CY)	36.7	40.6	44.5	48.3	50.3
Structure Excavation (CY)	36.7	40.6	44.5	48.3	50.3
Structure Excavation Cost [$65/CY]	$2,387.78	$2,639.13	$2,890.47	$3,141.82	$3,267.49
Remove Exist Wall Cost [$4/LF]					
Barrier (Type 736S) [$90/LF]	$21,600.00	$21,600.00	$21,600.00	$21,600.00	$21,600.00
Wall Cost (Masonry)	$52,398.78	$60,140.13	$67,881.47	$75,622.82	$82,613.49
Traffic Control	$3,740.00	$3,740.00	$3,740.00	$3,740.00	$3,740.00
Contingencies (10%)	$5,239.88	$6,014.01	$6,788.15	$7,562.28	$8,261.35
Total Wall Cost (Masonry)	**$61,380**	**$69,890**	**$78,410**	**$86,930**	**$94,610**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S718 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	142	142	142	142	142
Piles Length (ft)	1344	1486	1627	1769	1840
Pile cost (Drill & Cast) [$50/LF]	$67,212.50	$74,287.50	$81,362.50	$88,437.50	$91,975.00
Sound Wall Area (SQFT)	9547	12357	15167	17977	20787
Masonry Cost[2] [$13/SQFT]	$124,104.50	$160,634.50	$197,164.50	$233,694.50	$270,224.50
Pile Volume (CY)	207.9	229.8	251.7	273.6	284.5
Structure Excavation (CY)	207.9	229.8	251.7	273.6	284.5
Structure Excavation Cost [$65/CY]	$13,514.84	$14,937.46	$16,360.07	$17,782.68	$18,493.99
Remove Exist Wall Cost [$4/LF]					
Barrier (Type 736S) [$90/LF]	$63,450.00	$63,450.00	$63,450.00	$63,450.00	$63,450.00
Wall Cost (Masonry)	$268,281.84	$313,309.46	$358,337.07	$403,364.68	$444,143.49
Traffic Control	$16,555.00	$16,555.00	$16,555.00	$16,555.00	$16,555.00
Contingencies (10%)	$26,828.18	$31,330.95	$35,833.71	$40,336.47	$44,414.35
Total Wall Cost (Masonry)	**$311,670**	**$361,200**	**$410,730**	**$460,260**	**$505,110**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S733 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	34	34	34	34	34
Piles Length (ft)	323	357	391	425	442
Pile cost (Drill & Cast) [$50/LF]	$16,150.00	$17,850.00	$19,550.00	$21,250.00	$22,100.00
Sound Wall Area (SQFT)	1749	2409	3069	3729	4389
Masonry Cost[2] [$13/SQFT]	$22,737.00	$31,317.00	$39,897.00	$48,477.00	$57,057.00
Pile Volume (CY)	50.0	55.2	60.5	65.7	68.4
Structure Excavation (CY)	50.0	55.2	60.5	65.7	68.4
Structure Excavation Cost [$65/CY]	$3,247.38	$3,589.21	$3,931.04	$4,272.87	$4,443.79
Remove Exist Wall Cost [$4/LF]					
Barrier (Type 736S) [$90/LF]	$29,700.00	$29,700.00	$29,700.00	$29,700.00	$29,700.00
Wall Cost (Masonry)	$71,834.38	$82,456.21	$93,078.04	$103,699.87	$113,300.79
Traffic Control	$4,730.00	$4,730.00	$4,730.00	$4,730.00	$4,730.00
Contingencies (10%)	$7,183.44	$8,245.62	$9,307.80	$10,369.99	$11,330.08
Total Wall Cost (Masonry)	**$83,750**	**$95,430**	**$107,120**	**$118,800**	**$129,360**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S746 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	13	13	14	16	17
Piles Length (ft)	112	132	161	184	207
Pile cost (Drill & Cast) [$50/LF]	$5,604.69	$6,593.75	$8,050.00	$9,200.00	$10,350.00
Sound Wall Area (SQFT)	1560	1950	2340	2730	3120
Masonry Cost[2] [$13/SQFT]	$20,280.00	$25,350.00	$30,420.00	$35,490.00	$40,560.00
Pile Cap (CY)	19.0	19.0	19.0	19.0	19.0
Structure Conc. Cost [$500/CY]	$9,479.17	$9,479.17	$9,479.17	$9,479.17	$9,479.17
Pile Volume (CY)	17.3	20.4	24.9	28.5	32.0
Structure Excavation (CY)	36.3	39.4	43.9	47.4	51.0
Structure Excavation Cost [$65/CY]	$2,359.26	$2,558.14	$2,850.96	$3,082.19	$3,313.43
Remove Exist Wall Cost [$4/LF]					
Wall Cost (Masonry)	$37,723.12	$43,981.06	$50,800.12	$57,251.36	$63,702.60
Traffic Control	$3,245.00	$3,245.00	$3,245.00	$3,245.00	$3,245.00
Contingencies (10%)	$3,772.31	$4,398.11	$5,080.01	$5,725.14	$6,370.26
Total Wall Cost (Masonry)	**$44,740**	**$51,620**	**$59,130**	**$66,220**	**$73,320**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S747A (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	28	28	30	34	37
Piles Length (ft)	237	279	341	392	442
Pile cost (Drill & Cast) [$50/LF]	$11,846.88	$13,937.50	$17,058.33	$19,594.23	$22,100.00
Sound Wall Area (SQFT)	3440	4300	5160	6020	6880
Masonry Cost[2] [$13/SQFT]	$44,720.00	$55,900.00	$67,080.00	$78,260.00	$89,440.00
Pile Cap (CY)	41.8	41.8	41.8	41.8	41.8
Structure Conc. Cost [$500/CY]	$20,902.78	$20,902.78	$20,902.78	$20,902.78	$20,902.78
Pile Volume (CY)	36.6	43.1	52.8	60.6	68.4
Structure Excavation (CY)	78.5	84.9	94.6	102.4	110.2
Structure Excavation Cost [$65/CY]	$5,099.49	$5,519.86	$6,147.39	$6,657.30	$7,161.15
Remove Exist Wall Cost [$4/LF]					
Wall Cost (Masonry)	$82,569.14	$96,260.14	$111,188.50	$125,414.31	$139,603.93
Traffic Control	$5,830.00	$5,830.00	$5,830.00	$5,830.00	$5,830.00
Contingencies (10%)	$8,256.91	$9,626.01	$11,118.85	$12,541.43	$13,960.39
Total Wall Cost (Masonry)	**$96,656**	**$111,720**	**$128,140**	**$143,790**	**$159,390**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S747B (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	21	21	22	26	28
Piles Length (ft)	179	210	257	295	332
Pile cost (Drill & Cast) [$50/LF]	$8,925.00	$10,500.00	$12,841.67	$14,728.85	$16,600.00
Sound Wall Area (SQFT)	2560	3200	3840	4480	5120
Masonry Cost[2] [$13/SQFT]	$33,280.00	$41,600.00	$49,920.00	$58,240.00	$66,560.00
Pile Cap (CY)	31.1	31.1	31.1	31.1	31.1
Structure Conc. Cost [$500/CY]	$15,555.56	$15,555.56	$15,555.56	$15,555.56	$15,555.56
Pile Volume (CY)	27.6	32.5	39.7	45.6	51.4
Structure Excavation (CY)	58.7	63.6	70.8	76.7	82.5
Structure Excavation Cost [$65/CY]	$3,816.83	$4,133.52	$4,604.38	$4,983.84	$5,360.09
Remove Exist Wall Cost [$4/LF]					
Wall Cost (Masonry)	$61,577.38	$71,789.08	$82,921.60	$93,508.25	$104,075.64
Traffic Control	$4,620.00	$4,620.00	$4,620.00	$4,620.00	$4,620.00
Contingencies (10%)	$6,157.74	$7,178.91	$8,292.16	$9,350.82	$10,407.56
Total Wall Cost (Masonry)	**$72,355**	**$83,588**	**$95,834**	**$107,480**	**$119,100**

Notes:

1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S765 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	14	14	15	18	19
Piles Length (ft)	123	144	176	202	227
Pile cost (Drill & Cast) [$50/LF]	$6,135.94	$7,218.75	$8,816.67	$10,084.62	$11,350.00
Sound Wall Area (SQFT)	1720	2150	2580	3010	3440
Masonry Cost[2] [$13/SQFT]	$22,360.00	$27,950.00	$33,540.00	$39,130.00	$44,720.00
Pile Cap (CY)	20.9	20.9	20.9	20.9	20.9
Structure Conc. Cost [$500/CY]	$10,451.39	$10,451.39	$10,451.39	$10,451.39	$10,451.39
Pile Volume (CY)	19.0	22.3	27.3	31.2	35.1
Structure Excavation (CY)	39.9	43.2	48.2	52.1	56.0
Structure Excavation Cost [$65/CY]	$2,592.47	$2,810.20	$3,131.50	$3,386.46	$3,640.90
Remove Exist Wall Cost [$4/LF]					
Wall Cost (Masonry)	$41,539.80	$48,430.34	$55,939.56	$63,052.46	$70,162.29
Traffic Control	$3,465.00	$3,465.00	$3,465.00	$3,465.00	$3,465.00
Contingencies (10%)	$4,153.98	$4,843.03	$5,593.96	$6,305.25	$7,016.23
Total Wall Cost (Masonry)	**$49,160**	**$56,740**	**$65,000**	**$72,820**	**$80,640**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S766 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	**10**	**12**	**14**	**16**
# of Piles	10	10	11	12	13
Piles Length (ft)	86	101	123	140	157
Pile cost (Drill & Cast) [$50/LF]	$4,276.56	$5,031.25	$6,133.33	$6,988.46	$7,850.00
Sound Wall Area (SQFT)	1160	1450	1740	2030	2320
Masonry Cost[2] [$13/SQFT]	$15,080.00	$18,850.00	$22,620.00	$26,390.00	$30,160.00
Pile Cap (CY)	14.1	14.1	14.1	14.1	14.1
Structure Conc. Cost [$500/CY]	$7,048.61	$7,048.61	$7,048.61	$7,048.61	$7,048.61
Pile Volume (CY)	13.2	15.6	19.0	21.6	24.3
Structure Excavation (CY)	27.3	29.7	33.1	35.7	38.4
Structure Excavation Cost [$65/CY]	$1,776.23	$1,927.98	$2,149.59	$2,321.53	$2,494.77
Remove Exist Wall Cost [$4/LF]					
Wall Cost (Masonry)	$28,181.41	$32,857.85	$37,951.53	$42,748.61	$47,553.38
Traffic Control	$2,695.00	$2,695.00	$2,695.00	$2,695.00	$2,695.00
Contingencies (10%)	$2,818.14	$3,285.78	$3,795.15	$4,274.86	$4,755.34
Total Wall Cost (Masonry)	**$33,690**	**$38,840**	**$44,440**	**$49,720**	**$55,000**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S788 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	20	20	20	20	20
Piles Length (ft)	190	210	230	250	260
Pile cost (Drill & Cast) [$50/LF]	$9,500.00	$10,500.00	$11,500.00	$12,500.00	$13,000.00
Sound Wall Area (SQFT)	1007	1387	1767	2147	2527
Masonry Cost[2] [$13/SQFT]	$13,091.00	$18,031.00	$22,971.00	$27,911.00	$32,851.00
Pile Volume (CY)	29.4	32.5	35.6	38.7	40.2
Structure Excavation (CY)	29.4	32.5	35.6	38.7	40.2
Structure Excavation Cost [$65/CY]	$1,910.22	$2,111.30	$2,312.38	$2,513.45	$2,613.99
Remove Exist Wall Cost [$4/LF]					
Barrier (Type 736S) [$90/LF]	$17,100.00	$17,100.00	$17,100.00	$17,100.00	$17,100.00
Wall Cost (Masonry)	$41,601.22	$47,742.30	$53,883.38	$60,024.45	$65,564.99
Traffic Control	$3,190.00	$3,190.00	$3,190.00	$3,190.00	$3,190.00
Contingencies (10%)	$4,160.12	$4,774.23	$5,388.34	$6,002.45	$6,556.50
Total Wall Cost (Masonry)	**$48,950**	**$55,710**	**$62,460**	**$69,220**	**$75,310**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S807 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	59	59	59	59	59
Piles Length (ft)	561	620	679	738	767
Pile cost (Drill & Cast) [$50/LF]	$28,025.00	$30,975.00	$33,925.00	$36,875.00	$38,350.00
Sound Wall Area (SQFT)	3074	4234	5394	6554	7714
Masonry Cost[2] [$13/SQFT]	$39,962.00	$55,042.00	$70,122.00	$85,202.00	$100,282.00
Pile Volume (CY)	86.7	95.8	104.9	114.1	118.6
Structure Excavation (CY)	86.7	95.8	104.9	114.1	118.6
Structure Excavation Cost [$65/CY]	$5,635.16	$6,228.34	$6,821.51	$7,414.69	$7,711.28
Remove Exist Wall Cost [$4/LF]					
Barrier (Type 736S) [$90/LF]	$52,200.00	$52,200.00	$52,200.00	$52,200.00	$52,200.00
Wall Cost (Masonry)	$125,822.16	$144,445.34	$163,068.51	$181,691.69	$198,543.28
Traffic Control	$7,480.00	$7,480.00	$7,480.00	$7,480.00	$7,480.00
Contingencies (10%)	$12,582.22	$14,444.53	$16,306.85	$18,169.17	$19,854.33
Total Wall Cost (Masonry)	**$145,880**	**$166,370**	**$186,860**	**$207,340**	**$225,880**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S811 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	19	19	20	23	25
Piles Length (ft)	160	188	230	264	297
Pile cost (Drill & Cast) [$50/LF]	$7,995.31	$9,406.25	$11,500.00	$13,180.77	$14,850.00
Sound Wall Area (SQFT)	2280	2850	3420	3990	4560
Masonry Cost[2] [$13/SQFT]	$29,640.00	$37,050.00	$44,460.00	$51,870.00	$59,280.00
Pile Cap (CY)	27.7	27.7	27.7	27.7	27.7
Structure Conc. Cost [$500/CY]	$13,854.17	$13,854.17	$13,854.17	$13,854.17	$13,854.17
Pile Volume (CY)	24.7	29.1	35.6	40.8	45.9
Structure Excavation (CY)	52.4	56.8	63.3	68.5	73.6
Structure Excavation Cost [$65/CY]	$3,408.71	$3,692.42	$4,113.42	$4,451.38	$4,787.02
Remove Exist Wall Cost [$4/LF]	$11,400.00	$11,400.00	$11,400.00	$11,400.00	$11,400.00
Wall Cost (Masonry)	$66,298.19	$75,402.83	$85,327.59	$94,756.32	$104,171.19
Traffic Control	$4,235.00	$4,235.00	$4,235.00	$4,235.00	$4,235.00
Contingencies (10%)	$6,629.82	$7,540.28	$8,532.76	$9,475.63	$10,417.12
Total Wall Cost (Masonry)	**$77,160**	**$87,180**	**$98,095**	**$108,470**	**$118,820**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S828A (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	131	131	131	131	131
Piles Length (ft)	1245	1376	1507	1638	1703
Pile cost (Drill & Cast) [$50/LF]	$62,225	$68,775	$75,325	$81,875	$85,150
Sound Wall Area (SQFT)	6890	9490	12090	14690	17290
Masonry Cost[2] [$13/SQFT]	$89,570	$123,370	$157,170	$190,970	$224,770
Pile Volume (CY)	192.5	212.8	233.0	253.3	263.4
Structure Excavation (CY)	$192.49	$212.75	$233.02	$253.28	$263.41
Structure Excavation Cost [$65/CY]	12512.0	13829.0	15146.1	16463.1	17121.6
Remove Exist Wall Cost [$4/LF]	62400.0	62400.0	62400.0	62400.0	62400.0
Barrier (Type 736S) [$90/LF]	$117,000.00	$117,000.00	$117,000.00	$117,000.00	$117,000.00
Wall Cost (Masonry)	$343,706.97	$385,374.02	$427,041.07	$468,708.12	$506,441.65
Traffic Control	$15,400.00	$15,400.00	$15,400.00	$15,400.00	$15,400.00
Contingencies (10%)	$34,370.70	$38,537.40	$42,704.11	$46,870.81	$50,644.16
Total Wall Cost (Masonry)	**$393,480**	**$439,310**	**$485,150**	**$530,980**	**$572,490**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S828B (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	134	134	134	134	134
Piles Length (ft)	1268	1402	1535	1669	1735.5
Pile cost (Drill & Cast) [$50/LF]	$63,413	$70,088	$76,763	$83,438	$86,775
Sound Wall Area (SQFT)	7022.5	9672.5	12322.5	14972.5	17622.5
Masonry Cost[2] [$13/SQFT]	$91,293	$125,743	$160,193	$194,643	$229,093
Pile Volume (CY)	196.2	216.8	237.5	258.1	268.4
Structure Excavation (CY)	$196.17	$216.81	$237.46	$258.11	$268.44
Structure Excavation Cost [$65/CY]	12750.8	14092.9	15435.1	16777.3	17448.4
Remove Exist Wall Cost [$4/LF]	63600.0	63600.0	63600.0	63600.0	63600.0
Barrier (Type 736S) [$90/LF]	$119,250.00	$119,250.00	$119,250.00	$119,250.00	$119,250.00
Wall Cost (Masonry)	$350,305.75	$392,772.93	$435,240.12	$477,707.30	$516,165.90
Traffic Control	$15,675.00	$15,675.00	$15,675.00	$15,675.00	$15,675.00
Contingencies (10%)	$35,030.58	$39,277.29	$43,524.01	$47,770.73	$51,616.59
Total Wall Cost (Masonry)	**$401,010**	**$447,730**	**$494,440**	**$541,150**	**$583,460**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S841 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	56	56	56	56	56
Piles Length (ft)	532	588	644	700	728
Pile cost (Drill & Cast) [$50/LF]	$26,600.00	$29,400.00	$32,200.00	$35,000.00	$36,400.00
Sound Wall Area (SQFT)	2915	4015	5115	6215	7315
Masonry Cost[2] [$13/SQFT]	$37,895.00	$52,195.00	$66,495.00	$80,795.00	$95,095.00
Pile Volume (CY)	82.3	90.9	99.6	108.3	112.6
Structure Excavation (CY)	$82.29	$90.95	$99.61	$108.27	$112.60
Structure Excavation Cost [$65/CY]	5348.6	5911.6	6474.7	7037.7	7319.2
Remove Exist Wall Cost [$4/LF]					
Barrier (Type 736S) [$90/LF]	$49,500.00	$49,500.00	$49,500.00	$49,500.00	$49,500.00
Wall Cost (Masonry)	$119,343.63	$137,006.64	$154,669.66	$172,332.67	$188,314.18
Traffic Control	$7,150.00	$7,150.00	$7,150.00	$7,150.00	$7,150.00
Contingencies (10%)	$11,934.36	$13,700.66	$15,466.97	$17,233.27	$18,831.42
Total Wall Cost (Masonry)	**$138,430**	**$157,860**	**$177,290**	**$196,720**	**$214,300**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S857 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	24	24	24	24	24
Piles Length (ft)	223	247	270	294	305.5
Pile cost (Drill & Cast) [$50/LF]	$11,162.50	$12,337.50	$13,512.50	$14,687.50	$15,275.00
Sound Wall Area (SQFT)	1192.5	1642.5	2092.5	2542.5	2992.5
Masonry Cost[2] [$13/SQFT]	$15,502.50	$21,352.50	$27,202.50	$33,052.50	$38,902.50
Pile Volume (CY)	34.5	38.2	41.8	45.4	47.3
Structure Excavation (CY)	$34.53	$38.17	$41.80	$45.44	$47.25
Structure Excavation Cost [$65/CY]	2244.5	2480.8	2717.0	2953.3	3071.4
Remove Exist Wall Cost [$4/LF]					
Barrier (Type 736S) [$90/LF]	$20,250.00	$20,250.00	$20,250.00	$20,250.00	$20,250.00
Wall Cost (Masonry)	$49,159.51	$56,420.78	$63,682.04	$70,943.31	$77,498.94
Traffic Control	$3,575.00	$3,575.00	$3,575.00	$3,575.00	$3,575.00
Contingencies (10%)	$4,915.95	$5,642.08	$6,368.20	$7,094.33	$7,749.89
Total Wall Cost (Masonry)	**$57,650**	**$65,640**	**$73,630**	**$81,610**	**$88,820**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S868 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	21	21	23	26	28
Piles Length (ft)	181	213	261	299	337
Pile cost (Drill & Cast) [$50/LF]	$9,057.81	$10,656.25	$13,033.33	$14,950.00	$16,850.00
Sound Wall Area (SQFT)	2600	3250	3900	4550	5200
Masonry Cost[2] [$13/SQFT]	$33,800.00	$42,250.00	$50,700.00	$59,150.00	$67,600.00
Pile Cap (CY)	31.6	31.6	31.6	31.6	31.6
Structure Conc. Cost [$500/CY]	$15,798.61	$15,798.61	$15,798.61	$15,798.61	$15,798.61
Pile Volume (CY)	28.0	33.0	40.3	46.2	52.1
Structure Excavation (CY)	59.6	64.6	71.9	77.8	83.7
Structure Excavation Cost [$65/CY]	$3,875.13	$4,196.54	$4,674.51	$5,059.91	$5,441.96
Remove Exist Wall Cost [$4/LF]					
Wall Cost (Masonry)	$62,531.55	$72,901.40	$84,206.46	$94,958.52	$105,690.57
Traffic Control	$4,675.00	$4,675.00	$4,675.00	$4,675.00	$4,675.00
Contingencies (10%)	$6,253.16	$7,290.14	$8,420.65	$9,495.85	$10,569.06
Total Wall Cost (Masonry)	**$73,460**	**$84,870**	**$97,302**	**$109,130**	**$120,930**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S896 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	**10**	**12**	**14**	**16**
# of Piles	8	8	8	9	10
Piles Length (ft)	67	79	96	109	122
Pile cost (Drill & Cast) [$50/LF]	$3,346.88	$3,937.50	$4,791.67	$5,440.38	$6,100.00
Sound Wall Area (SQFT)	880	1100	1320	1540	1760
Masonry Cost[2] [$13/SQFT]	$11,440.00	$14,300.00	$17,160.00	$20,020.00	$22,880.00
Pile Cap (CY)	10.7	10.7	10.7	10.7	10.7
Structure Conc. Cost [$500/CY]	$5,347.22	$5,347.22	$5,347.22	$5,347.22	$5,347.22
Pile Volume (CY)	10.4	12.2	14.8	16.8	18.9
Structure Excavation (CY)	21.0	22.9	25.5	27.5	29.6
Structure Excavation Cost [$75/CY]	$1,578.60	$1,715.63	$1,913.80	$2,064.31	$2,217.35
Remove Exist Wall Cost [$4/LF]					
Wall Cost (Masonry)	$21,712.69	$25,300.35	$29,212.69	$32,871.92	$36,544.57
Traffic Control	$2,310.00	$2,310.00	$2,310.00	$2,310.00	$2,310.00
Contingencies (10%)	$2,171.27	$2,530.03	$2,921.27	$3,287.19	$3,654.46
Total Wall Cost (Masonry)	**$26,190**	**$30,140**	**$34,440**	**$38,470**	**$42,510**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization

Cost Estimate for Barrier S909 (Alternative #1)

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
# of Piles	45	45	45	45	45
Piles Length (ft)	423	467	512	556	578.5
Pile cost (Drill & Cast) [$50/LF]	$21,137.50	$23,362.50	$25,587.50	$27,812.50	$28,925.00
Sound Wall Area (SQFT)	2305.5	3175.5	4045.5	4915.5	5785.5
Masonry Cost[2] [$13/SQFT]	$29,971.50	$41,281.50	$52,591.50	$63,901.50	$75,211.50
Pile Volume (CY)	65.4	72.3	79.2	86.0	89.5
Structure Excavation (CY)	$65.39	$72.27	$79.15	$86.04	$89.48
Structure Excavation Cost [$65/CY]	4250.3	4697.6	5145.0	5592.4	5816.1
Remove Exist Wall Cost [$4/LF]					
Barrier (Type 736S) [$90/LF]	$39,150.00	$39,150.00	$39,150.00	$39,150.00	$39,150.00
Wall Cost (Masonry)	$94,509.25	$108,491.64	$122,474.04	$136,456.43	$149,102.63
Traffic Control	$5,885.00	$5,885.00	$5,885.00	$5,885.00	$5,885.00
Contingencies (10%)	$9,450.93	$10,849.16	$12,247.40	$13,645.64	$14,910.26
Total Wall Cost (Masonry)	**$109,850**	**$125,230**	**$140,610**	**$155,990**	**$169,900**

Notes:
1. Estimates are based on Caltrans Database cost for 2008-2010
2. Includes cost for masonry, steel, cell fill material, scaffolding, and mobilization