

12 ROLLING HILLS ESTATES

12.1 Watershed Hydrology Analysis

The Rolling Hills Estates drainage area is part of the Dominguez Channel and LA Harbor watershed defined by County of Los Angeles DPW (Exhibit N). The majority of this drainage area is urbanized. This drainage area was updated in this MPD and it excludes areas that were previously included, which were found to be part of the City of Rolling Hills Estates (RHE).

There are three different smaller subareas within this drainage area. The west area is divided into five subwatersheds. Two of these have runoff that does not get collected by a known storm drain system. The other three are collected by short storm drain systems that outlet into streets further downstream. These five subwatersheds ultimately are collected by a storm drain system owned by the City of RHE. The south area has two subwatersheds that drain into the City of RHE. The other subwatersheds are collected by storm drain systems that connect to a facility owned by the County of Los Angeles DPW. The north area mostly drains into different storm drain systems that ultimately discharge into canyons or connect to storm drain facilities owned by Rolling Hills Estates and/or County of Los Angeles DPW. The subwatersheds tributary to the City of RHE are included as part of the hydrology analysis.

This drainage area was split in two RHE-A and RHE-B for modeling. The results for both the hydrology and hydraulic models will be in two separate tables and output files, and the cost analysis was completed together to provide a better understanding of the overall drainage area recommended improvements. The hydrology results for the 10-, 25- and 50-year storm events are provided in Appendix M-1.

12.1.1 Hydrology Results Summary 10-, 25-, 50-year storm events

Rolling Hills Estates A drainage area was divided into 49 subwatersheds and Table 12-1 summarizes the maximum 10-, 25-, and 50-year storm event discharge flow draining into each node.

Table 12-1: RHE-A Hydrology Summary					
Hydrology ID	Structure ID	Subarea (acres)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)
1A	CB3139	6.4	8.3	12	15.6
3A	CB1537	4.5	4.8	7.5	9.1
4B	CB1542	14.7	10.9	16.8	22.7
6A	IS3330	7.3	5.7	8.9	11.4
7B	CB3175	0.6	0.8	1.1	1.3
9C	CB1532	9.4	10.1	15.7	20.8
10C	MH3326	5.5	4.2	7.2	9.3
12D	MH3328	3.5	4.1	6	7.6
14E	CB1487	21.4	12.2	18.3	22.9
17E	MH21790	9.3	10.1	13.9	16.8
19F	JS2686	3.4	5.1	6.9	8.7
24G	MH1521	31.3	25.6	35.5	45.9
27H	MH1523	25.9	19.7	29.5	36.6
30G	CB1525	6	4.6	7.1	9
31I	IS1486	4.8	7.8	10.7	12.3

Table 12-1: RHE-A Hydrology Summary					
Hydrology ID	Structure ID	Subarea (acres)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)
34I	IS1460	5.4	7.3	9.7	11.9
35I	JS2016	15.5	14.5	20.6	24.9
37H	JS2685	11.7	8.9	12.6	15.4
39J	CB0985	2.7	4	5.6	7.3
40H	CB1004	9.7	7.4	10.5	13.1
42I	JS3399	3.3	3.3	4.9	6.2
44I	CB1000	12.2	10.2	14.6	18.5
46J	CB1030	18.4	15.3	21.4	27.2
49J	MH3518	2.9	3.5	4.8	6.1
52J	MH1007	10.8	9.3	13.4	17.6
54J	CB0997	6.8	6.3	9.3	11.4
56K	MH3489	22.3	18.5	26.6	33.7
58J	IS1014	24.5	19.2	28.8	35.6
61N	CB1502	10.4	8.4	12	15.3
62O	CB1492	6.6	4.7	7.1	9.1
63K	CB1495	24.5	14.7	21.2	26.8
64L	JS2465	8.9	7	10.3	12.5
67P	CB1506	3.4	3.6	5.5	6.7
68M	CB1456	0.9	1.3	1.9	2.2
70M	JS2687	6.9	8.9	11.8	14.4
72M	CB1452	25.5	21.8	30.8	36.8
73M	MH3293	17.6	17.3	23.8	28.4
76Q	CB1412	5.1	4.3	6.1	7.4
79L	MH32115	2.8	2	3.1	4.1
81R	CB1462	15.6	12.2	17.2	21.4
82K	CB1465	21.4	11.2	17	23.2
84S	86H	9.5	10.4	13.9	16.5
85T	CB1459	8.4	6.3	9	11.3
86U	CB1473	18.9	15.1	22.2	28.6
87V	81	26.3	26.3	37.4	45.2
88W	82	16.2	13.7	19	23.6
89X	87	11.3	13.1	18.3	22.5
90Y	88	4.6	6.4	8.8	11.3
91Z	89	35.9	28.1	40.1	49.6

Similarly, Rolling Hills Estates B was divided into 8 subwatersheds and Table 12-2 summarizes the maximum 10-, 25-, and 50- year storm event discharge flow draining into each node.

Table 12-2: RHE-B Hydrology Summary					
Hydrology ID	Structure ID	Subarea (acres)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)
1A	CB1549	5.8	7.9	11	14.7
2B	CB1550	11.6	7.9	11.4	14.9
3B	CB1552	8.5	6.7	9.8	12.5
5C	CB1554	16.8	13.6	20.3	25.1
8B	CB48131	8	6.5	10.2	13.1
10B	CB1600	5	3.9	6.3	7.8

Table 12-2: RHE-B Hydrology Summary					
Hydrology ID	Structure ID	Subarea (acres)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)
12B	CB1603	7.8	7.3	11.1	14.6
14A	IS38118	17.8	12.5	19.3	24

12.2 Hydraulic Analysis

12.2.1 Existing Condition

Table 12-3 provides important modeling assumptions used for the hydraulic analysis and Appendix M-2 provides the existing condition hydraulic analysis for the 10-, 25- and 50-year storm events.

Table 12-3: RHE Hydraulic Model Assumptions					
System	Upstream Structure ID	Downstream Structure ID	Pipe ID	Street	Assumption
1	CB1488	JS48536	SD46760	Hawthorne Boulevard	The as-built for the street improvements provides the storm drain size and material information. The storm drain profile is missing. The invert elevations were calculated using JS48136 invert elevation and the street slope.
	JS48536	JS2387	SD46761		
	JS2387	MH21790	SD22405		
	MH21790	JS2686	SD2704		
	JS2686	MH1489	SD2687		
	MH1489	JS48136	SD2674		
2	CB0997	CB0998	SD2749	Crest Road	18-inch RCP with 3 feet of cover was assumed.
	CB0998	PC0999	SD2744		
3	IS1014	JS2683	SD2736	Middlecrest Road	Used a 24-inch CMP culvert and the ground elevations to find the slope.
	JS2683	JS2684	SD2734		
	JS2684	OS1013	SD2731		

12.2.1.1 Results

This drainage area has several systems that in the existing condition analysis were observed to be deficient, including the storm drain system going from Hawthorne Blvd to Hawkhurst Drive. This storm drain system is very steep in the portion located under Hawthorne Boulevard, and is flatter when it turns to Hawkhurst Drive. The portion of the pipe that bends 90 degrees to turn into Hawkhurst Drive is critical to the proper functioning of this system. At that point flows are high, the pipe bends and changes slope significantly. An increase in size for this pipe is recommended. Tables 12-4 and 12-5 provide a list of the storm drain structures that were flooded in the 10- and 50-year hydraulic analysis.

Table 12-4: RHE-A Flooded Storm Drain Structures		
Storm Drain Structure ID	Floods in 50-Year Storm Event	Floods in 10-Year Storm Event
IS1014	X	X
GB3435	X	
CB1465	X	
JS3297	X	
GB2490	X	
CB3143	X	
CB3144	X	
MH3489	X	
GB1482	X	
MH1521	X	
JS2687	X	

Table 12-5: RHE-B Flooded Storm Drain Structures		
Storm Drain Structure ID	Floods in 50-Year Storm Event	Floods in 10-Year Storm Event
CB1554	X	

12.2.2 Recommended Improvements

Table 12-6 provides the storm drain systems within this drainage area that were found to be deficient following Section 2.4.4 criteria, and improvements are recommended. The recommended improvement maps (atlas map) are attached at the end of this chapter (Figure 12-1). The proposed condition hydraulic analysis results are included in Appendix M-3.

Table 12-6: RHE Pipes to be Improved								
System	Owner	Upstream Structure ID	Downstream Structure ID	Pipe ID	Atlas Map	Existing Size (in)	Proposed Size (in)	Street
1	RPV	GB3487	JS3488	SD2519	13A	39	48	Crestridge Road
		JS3488	MH3489	SD2517		39	48	
		MH3489	OS1015	SD2520		36	48	
2	RPV	IS1014	JS2683	SD2736*	13A	24	48	Middlecrest Road
		JS2683	JS2684	SD2734*		24	48	
		JS2684	OS1013	SD2731*		24	48	
3	LAC	JS2686	MH1489	SD2687*	7A	21	24	Hawthorne Boulevard Hawkhurst Drive
		MH1489	JS48136	SD2674*	5C	21	24	
		JS48136	MH1521	SD46770		21	30	
		MH1521	GB2490	SD1495		24	30	
		GB2490	MH1513	SD1496		27	36	
		MH1513	MH1514	SD0039		24	36	
		MH1514	JS2492	SD1498		24	36	
		JS2492	MH1515	SD1499		24	36	
		MH1515	MH1516	SD0038		24	36	
		MH1516	GB2493	SD1500		24	36	
		GB2493	TS1522	SD1501		24	36	
		TS1522	MH1523	SD0035		30	36	

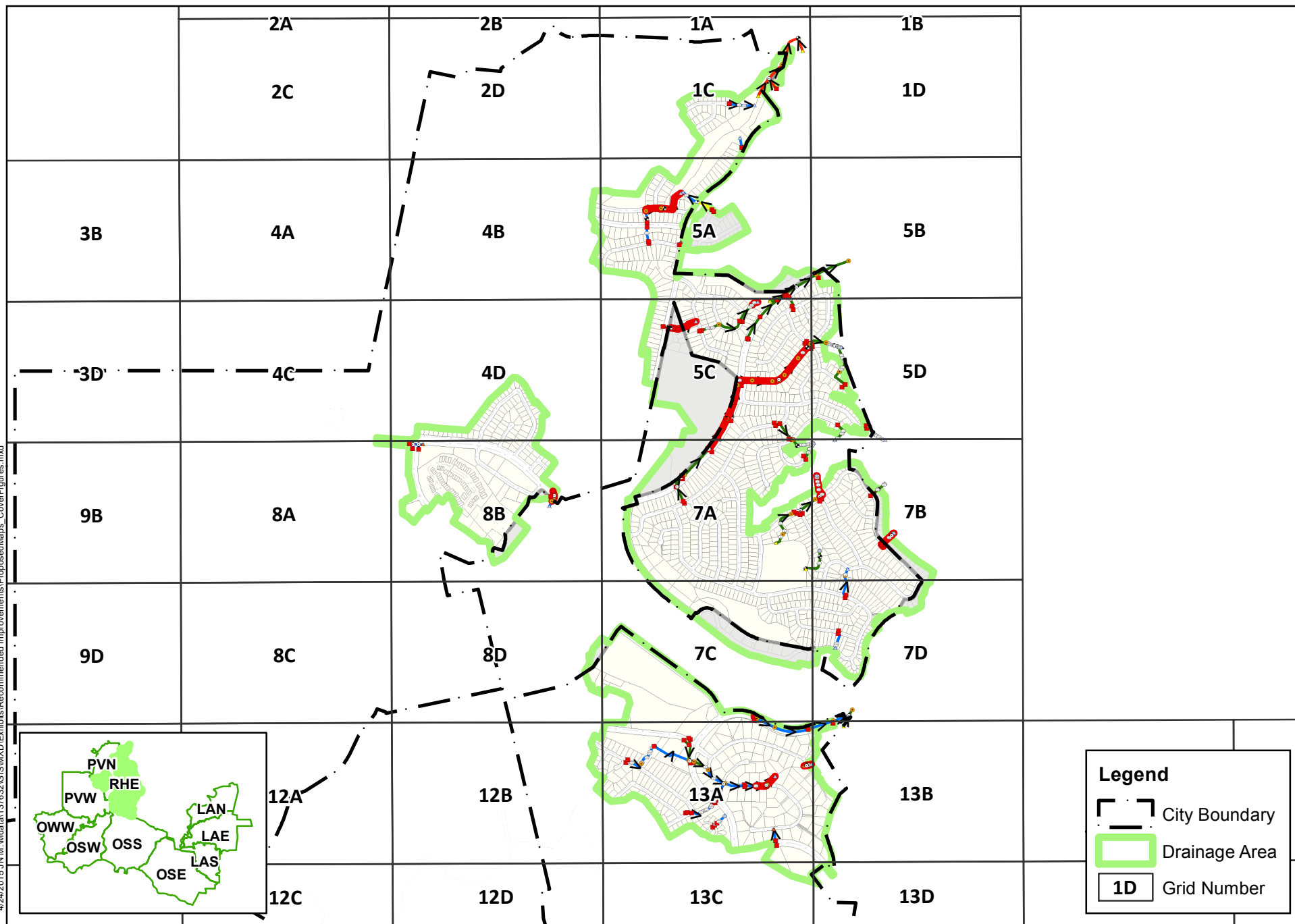
Table 12-6: RHE Pipes to be Improved								
System	Owner	Upstream Structure ID	Downstream Structure ID	Pipe ID	Atlas Map	Existing Size (in)	Proposed Size (in)	Street
4	RPV	CB1452	JS3297	SD2705	8B	24	6X2	Hawthorne Boulevard
		JS3297	MH3293	SD2279		24	6X2	
		MH3293	JS3295	SD2280		24	6X2	
5	LAC	TS3146	CB3143	SD2136	5C	18	24	Via de la Vis Shadow Wood
		CB3143	CB3144	SD2137		18	24	
		CB3144	CB3145	SD2138		18	24	
		CB3145	OS1536	SD2139		18	24	
6	LAC	MC3434	GB3435	SD2434	5C	24	30	Hawthorne Boulevard
		GB3435	OS1538	SD2435		24	30	
7	LAC	CB1465	CB1467	SD0090	7B	18	30	Browndeer Lane
		CB1467	CB1470	SD0088		21	30	
		CB1470	GB2385	SD1344		27	30	
		GB2385	JS2389	SD1348		27	30	
		JS2389	GB1469	SD1349		27	30	
		GB1469	OS1468	SD1352		27	30	
8	LAC	JS2685	GB1482	SD2438	7B	24	30	Browndeer Lane
		GB1482	GB3437	SD2439		24	36	
		GB3437	GB3438	SD2440		18	36	
		GB3438	GB3439	SD2441		18	36	
		GB3439	GB3440	SD2442		18	36	
		GB3440	GB3441	SD2443		18	36	
		GB3441	OS1481	SD2444		18	36	
7	RPV	MH1553	MH1558	SD0021	5A	24	30	Ironwood Street
		TS1557	OS1556	SD0023		24	30	
Notes:								
*Existing pipe characteristic includes assumptions.								

12.2.3 Cost Estimates

Table 12-6 provides an estimate of the construction cost of recommended improvements for this drainage area. Appendix B-9 includes the cost estimates for each recommended improvement map.

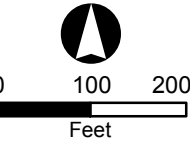
Table 12-7: RHE Total Cost Estimate	
Atlas Map	Total Project Cost
5A	\$344,000
5C	\$240,000
5C & 7A	\$1,418,000
7B	\$367,000
8B	\$834,000
13A	\$357,000
Total	\$3,560,000

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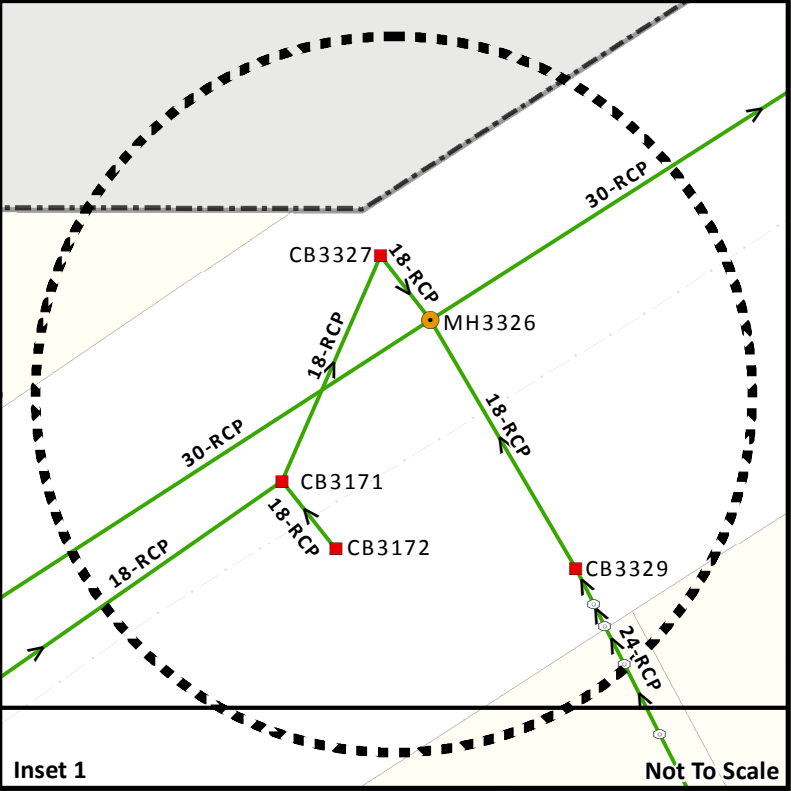




- Catch Basin
- Inlet
- Outlet
- Parkway
Outlet
- Manhole
- Junction
- Transition
- Grade Break
- Proposed
Pipe
- Proposed
Size
- 30"
- Open
Watercou...
- Rancho
Palos
Verdes
- Rolling Hills
Estates
- Palos
Verdes
Estates
- Private
- City of LA
- County of
LA
- Unknown
- City
Boundary

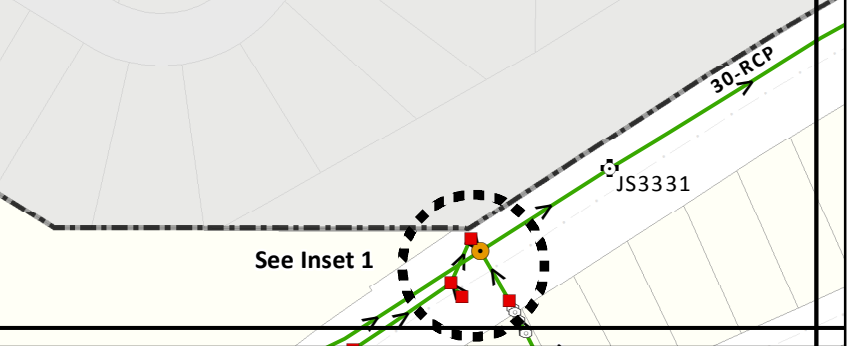


2D	1C	1D
4B	5A	5B
4D	5C	5D



Inset 1

Not To Scale



See Inset 1



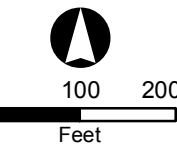
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Storm Water
Recommended
Improvements

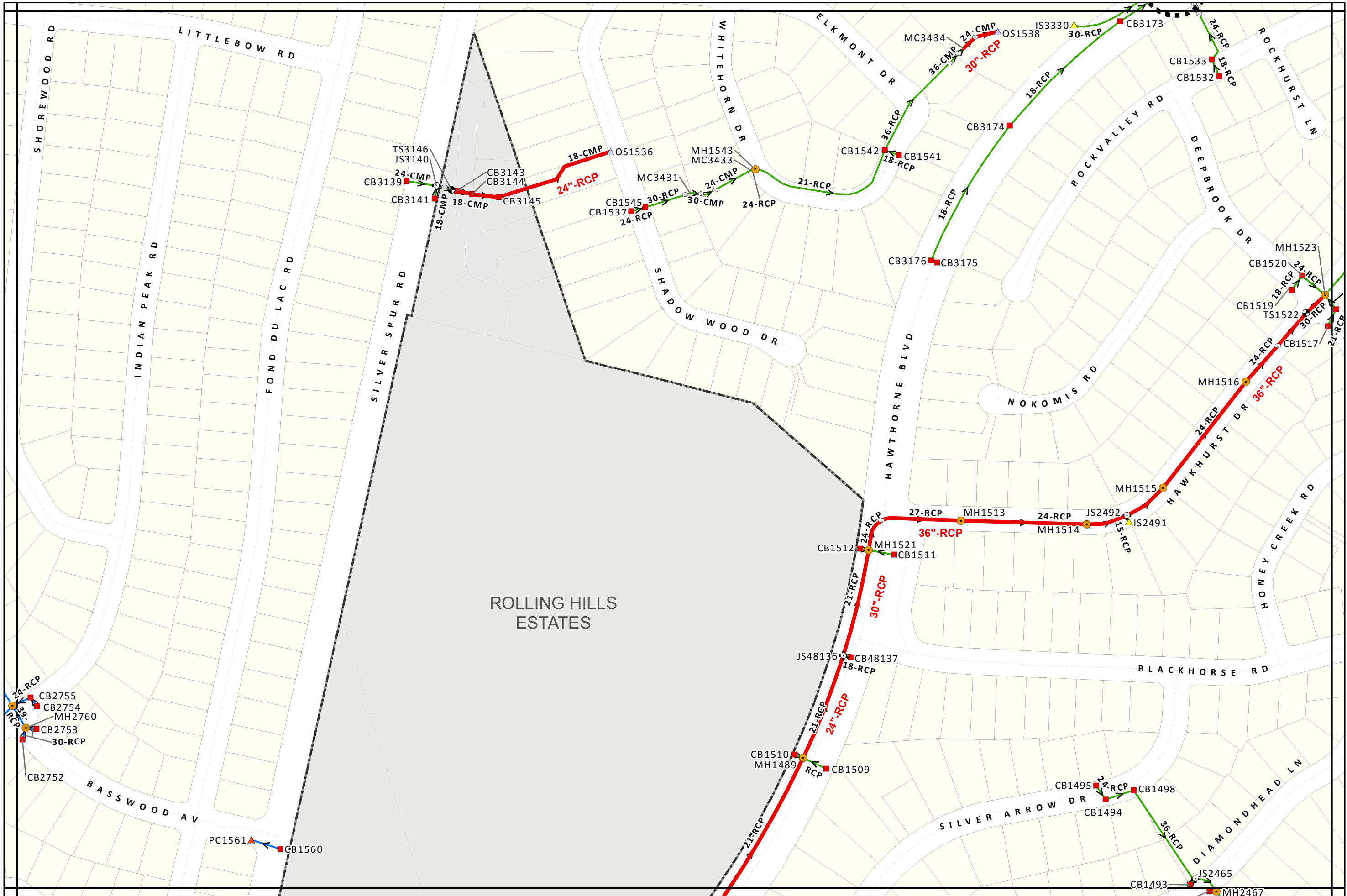
- Catch Basin
- Inlet
- Outlet
- Parkway Outlet
- Manhole
- Junction
- Transition
- Grade Break
- Storm Filter and Storm Gate
- Proposed Pipe
- Proposed Size
- Open Watercourse
- Rancho Palos Verdes
- Rolling Hills Estates
- Palos Verdes Estates

- Private
- City of LA
- County of LA
- Unknown

City Boundary



4B	5A	5B
4D	5C	5D
8B	7A	7B





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Storm Water

Recommended

Improvements

■ Catch Basin

▲ Inlet

▲ Outlet

▲ Parkway
Outlet

● Manhole

⊕ Junction

⊕ Transition

○ Grade Break

Storm Filter
and Storm
Gate

Proposed
Pipe

30"
Proposed
Size

Open
Watercourse

Rancho
Palos Verdes

Rolling Hills
Estates

Palos Verdes
Estates

Private

City of LA

County of LA

Unknown

City
Boundary

0 100 200

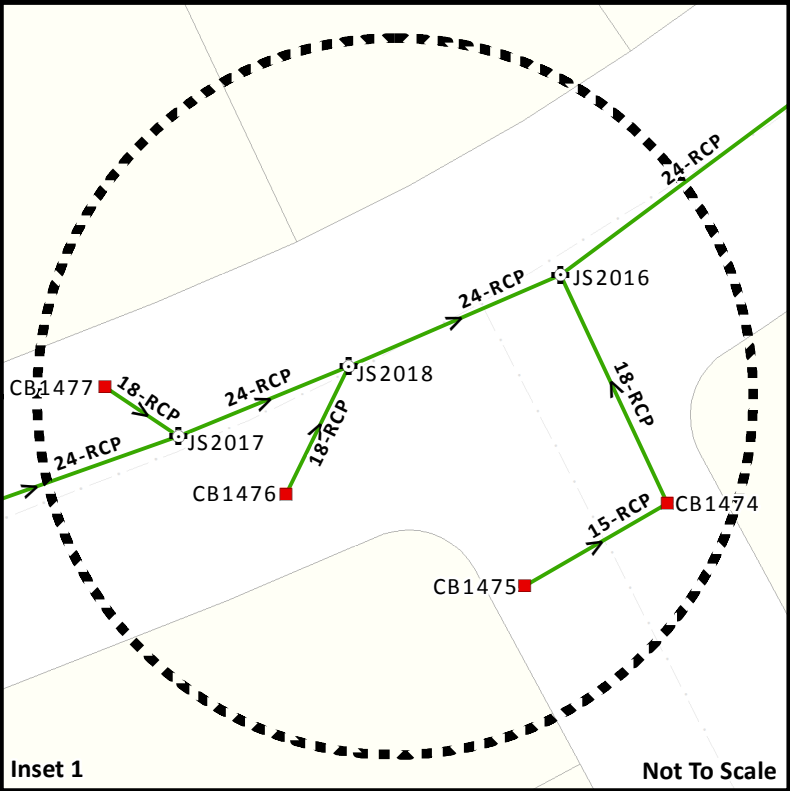
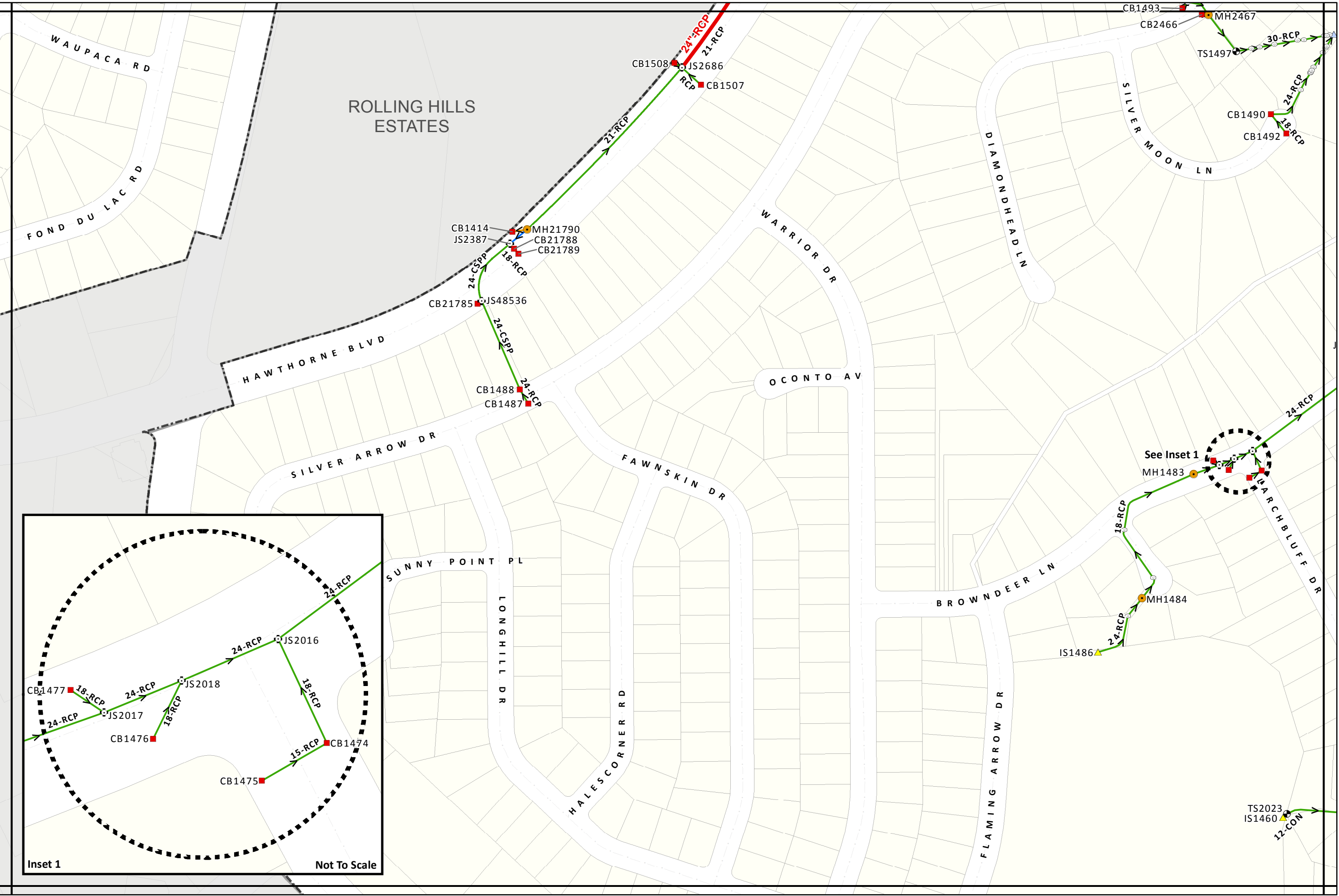
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4D 5C 5D

8B 7A 7B

8D 7C 7D

Page 7A

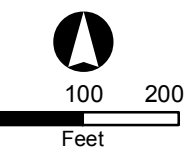




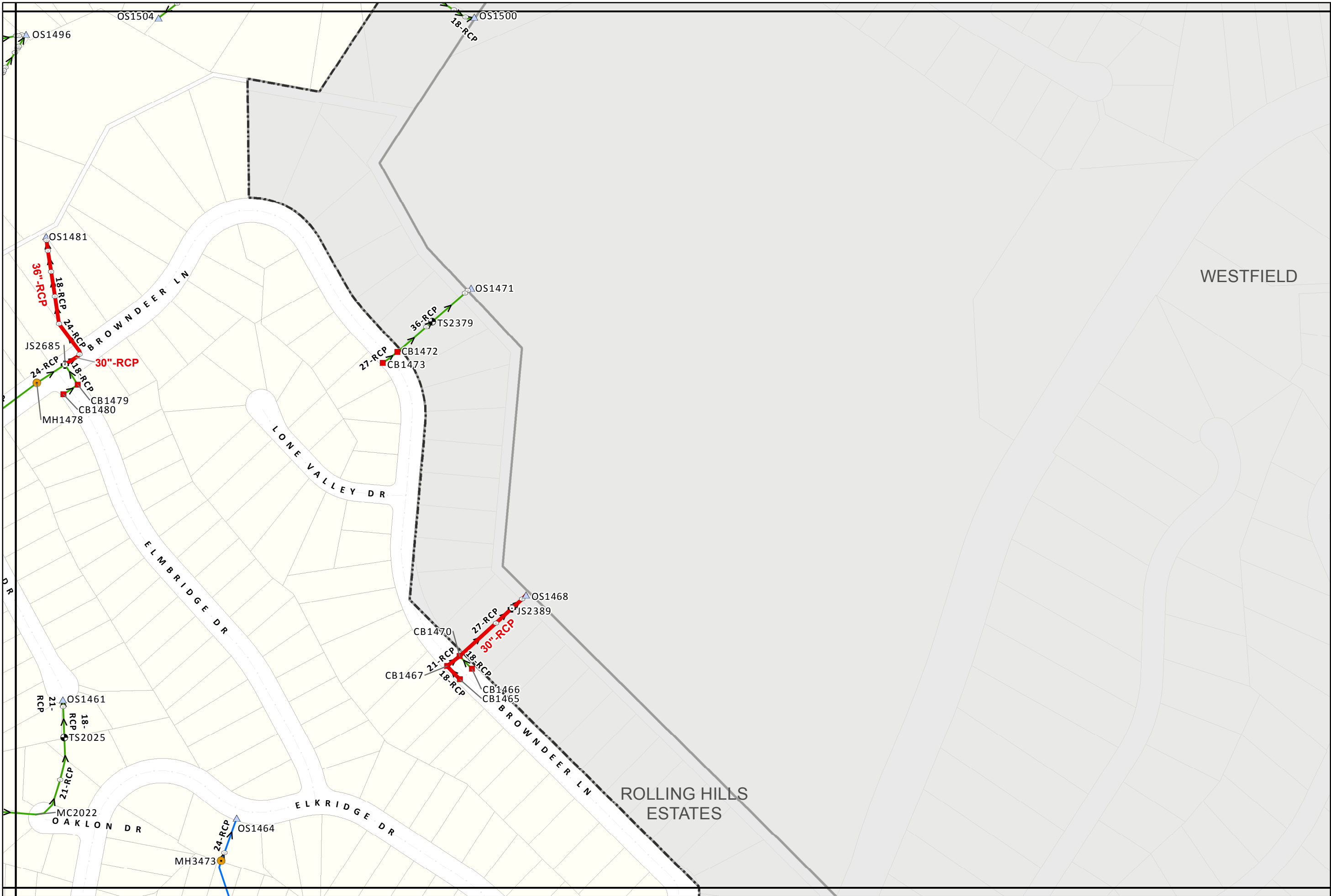
Storm Water
Recommended
Improvements

- Catch Basin
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City Boundary



5C	5D	
7A	7B	
7C	7D	





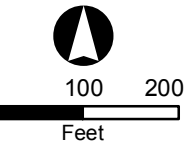
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Storm Water
Recommended
Improvements

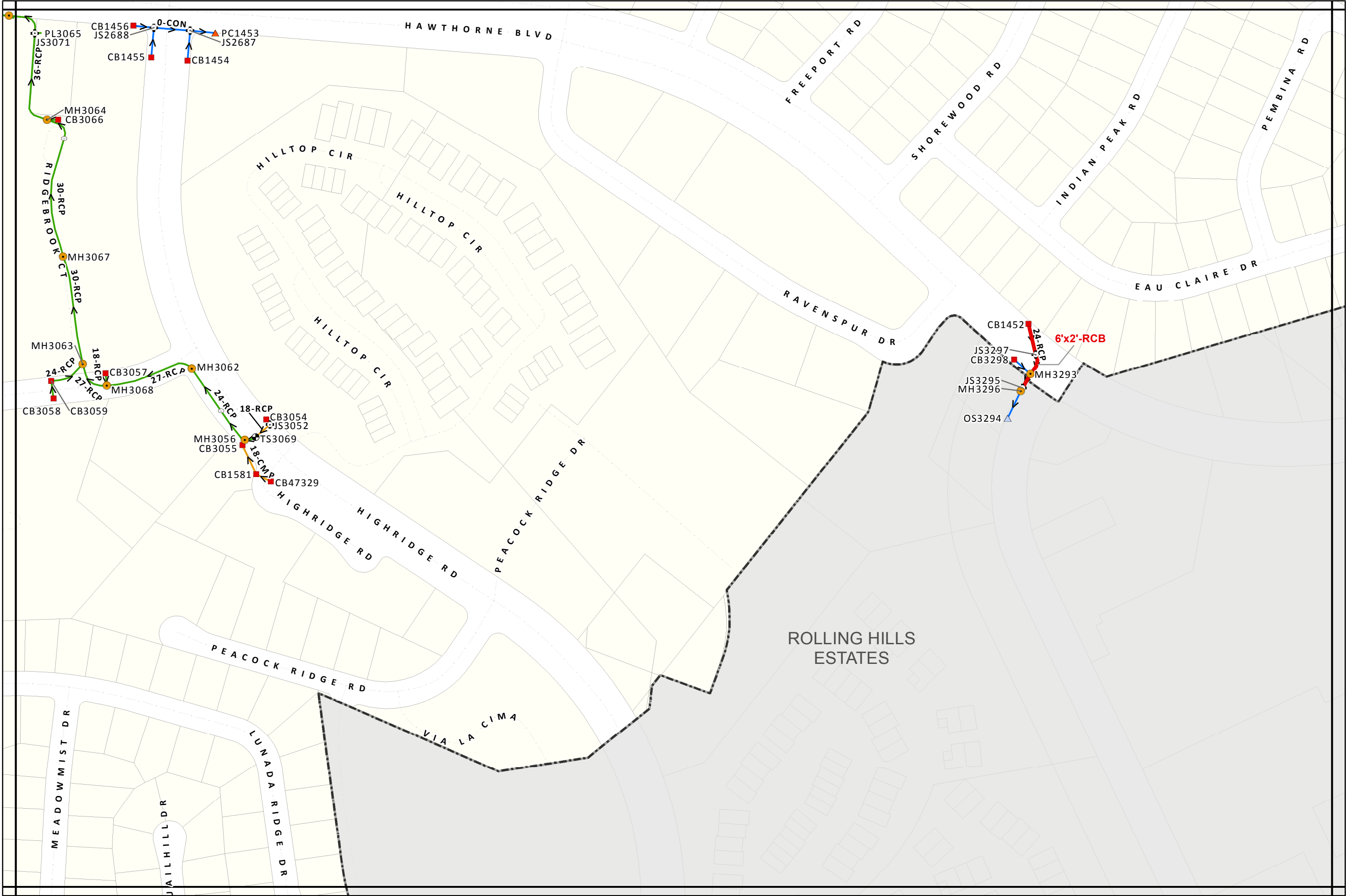
- Catch Basin
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Outlet
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- Junction
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and Storm
Gate
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Palos Verdes
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Estates
- Palos Verdes
Estates

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- County of LA
- Unknown

City
Boundary



4C	4D	5C
8A	8B	7A
8C	8D	7C





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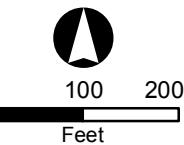
Storm Water
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Improvements

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- Proposed Size
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- Rancho Palos Verdes

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- Palos Verdes Estates

- Private
- City of LA
- County of LA
- Unknown

- City Boundary



8D	7C	7D
12B	13A	13B
12D	13C	13D

