

5 OCEAN SOUTH WEST

5.1 Watershed Hydrology Analysis

The Ocean South West drainage area is part of the Santa Monica Bay Watershed defined by County of Los Angeles DPW (Exhibit G). This area includes several different storm drain systems within the urbanized areas that collect runoff water and ultimately discharge into the Ocean. There are three systems in the northwest portion of this watershed that discharge into two different main canyons, the McCarrell Canyon and the Barkentine Canyon. The runoff from these two canyons is collected by two storm drain inlets. For Barkentine Canyon, the storm drain inlet (IS3554) is located at the north-end of Barkentine Rd. McCarrell Canyon downstream storm drain inlet (IS0696) is located north of Palos Verdes Drive S and west of Tarragon Rd. The hydrology IDs are 59E and 50A, respectively. In this MPD, the Terranea storm drain system was added in the ArcGIS database and it was included in the hydrology analysis. This system was built in 2007 and it was not included in the 2004 MPD. This drainage area includes the Three Sisters Reserve and the Alta Vicente Reserve.

The hydrology results for the 10-, 25- and 50-year storm events are provided in Appendix F-1.

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

Ocean South West was divided into 112 subwatersheds and Table 5-1 summarizes the maximum 10-, 25-, and 50- year storm event discharge flow draining into each node.

Hydrology ID	Structure ID	Subarea (acres)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)
1A	CB1065	35.8	30.4	41.8	51.5
4B	JS3256	4.2	3.7	5.2	6.3
6B	CB3237	23.3	20.2	29.1	35.4
12D	CB3243	19.1	13.3	19.4	24.1
14D	MH1070	1.5	1.3	1.8	2.3
16D	MH1072	0.6	0.8	1	1.3
19D	MH1079	2.2	3	4.2	5.3
22D	CB5311	4.3	4.6	6.6	8.1
29D	CB2638	7	6.1	9.1	11.2
33E	CB2625	10.4	9.5	13.8	17.2
38E	TS2630	6.5	4.9	7.3	9.4
41B	1525	2.8	3.1	4.8	5.6
42B	1525	8.3	8.6	12.8	15.7
44B	CB3250	12.1	10.1	14.2	17.6
45B	OS3251	6.4	5.1	7.9	9.9
46E	CB2644	11.9	8.2	12	15.3
50A	IS3554	58.5	42.6	61.6	75.7
53B	MH3547	3.5	5.4	7.2	8.9
55D	MH3544	1.5	2.4	3.3	4.1
57D	CB3555	1.7	2.9	3.9	4.5
59E	IS0696	46	37.7	55	66.3
63G	MH0682	20.4	23.1	31.8	38.5
68F	JS13321	2	3.1	4.1	5.1

Table 5-1: OSW Hydrology Summary					
Hydrology ID	Structure ID	Subarea (acres)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)
71F	CB3534	14.5	14.2	19.6	23.4
74F	MH3528	6.1	6.1	8.4	10.6
75H	MH3526	10.6	11.4	15.6	18.8
78G	MH3539	3.1	4.3	5.7	7
80R	CB0552	15.8	16.3	22.5	28.7
82G	MH0553	4.3	4.4	6	7.3
85G	MH25741	0.3	0.6	0.8	1
88G	MH25743	2.7	3.3	4.7	5.4
90H	MH37328	1.2	2.2	3	3.4
92H	CB37322	0.7	1	1.4	1.6
93J	MH37324	1.5	2.4	3.2	4.1
98J	CB25732	2.2	3.1	4.2	5.3
102H	MH25739	0.8	1.3	1.9	2.1
104K	MH25737	2.4	3.8	5	5.8
107J	IS25719	2.5	3	4.2	5.2
109H	MH25721	2.3	3.7	4.8	6
111H	IS25745	0.6	1.3	1.9	2.1
112J	MH25748	2.8	3.5	4.8	5.7
115H	IS40928	0.7	1.4	1.9	2.2
118S	CB13308	9.8	10.8	15.2	18.6
122J	CB0725	3.4	2.2	3.2	4.1
123K	IS0731	8.8	6.6	9.7	12.4
125K	JS0727	4.8	4.8	7	8.9
127K	CB2908	5.1	3.7	5.3	6.6
130K	CB1620	21.4	9.3	15.1	19.7
131K	1546	3.2	4	5.6	7.2
132K	1546	2	6.2	9.2	11.4
134K	CB2911	3.9	4.4	6.3	7.9
135L	CB0749	51.4	28	41.7	53.6
139L	MH0757	1.9	1.9	2.8	3.4
141L	CB0740	10.2	7.1	10.5	13.4
143K	IS0756	13.5	12	17.5	21.8
146K	CB0751	1.5	1.7	2.4	3.1
147K	IS2998	9.8	13.6	18.5	23.2
148K	IS2998	6.8	18.4	26	32.6
154J	JS3001	7.4	10.4	14.1	17.7
156L	CB3004	10.1	11.6	16.1	19.7
161J	MH0652	0.9	1.4	1.8	2.2
165J	JS3155	7.5	11.5	15.3	17.5
167J	IS0654	1.1	1.6	2.2	2.6
169K	CB0645	8.4	10.2	13.6	16.3
172J	MH0643	3.3	4.2	5.5	6.7
175J	CB0649	2.3	3.5	4.7	5.8
179J	MH2294	21.1	18.9	26.1	32.2
181J	JS2297	1	1	1.3	1.6
183F	OS2299	1.7	2	2.9	3.6
184F	1549	7.6	7.6	10.9	13.2
186T	IS25773	7.8	8.7	12.2	15
188J	CB3021	7.2	8.3	11.8	14.5

Table 5-1: OSW Hydrology Summary					
Hydrology ID	Structure ID	Subarea (acres)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)
191L	IS0608	10.2	8.5	12.4	16.3
196K	MH0601	13	9.4	14.2	17.3
201K	CB0599	2.6	2.5	3.6	4.5
202K	OS3023	2.4	3.5	4.9	5.6
204J	IS0536	2.8	4.4	5.9	7.5
205K	MH1623	0.5	0.8	1.1	1.4
207K	JS3157	1.5	2.2	3	3.7
210K	MH25784	1.4	1.8	2.6	3.3
212K	MH38125	0.6	0.8	1.1	1.4
214K	IS40930	9.3	11.2	15.4	18.7
215N	CB0538	30.2	21.2	29.8	37.6
216N	MH0545	4.9	6.5	8.7	10.8
218O	IS2811	28.9	18.1	27.5	35.1
226O	MH2829	6.6	8.7	12.4	15.6
228N	IS1741	14.8	19.4	25.7	31.4
229O	IS0549	8	11	15	18.8
231O	MH41325	0.7	0.9	1.3	1.5
235N	CB25781	3.2	3.9	5.5	6.9
237P	JS40939	4.1	5.4	7.7	9.7
241L	MH25770	7.9	8.6	12.5	15.3
243L	JS40530	0.5	0.7	1	1.2
247K	CB33719	2.2	3.2	4.3	5.4
249K	MH25760	0.6	1	1.4	1.7
251L	MH25764	1.5	3	4.1	4.7
253P	MH25777	3.2	4.4	6.3	7.8
255Q	MH25780	0.7	1.3	1.8	2.1
256Q	MH25780	0.4	2	2.7	3.1
260L	CB25751	4.4	6.6	8.7	10.6
274U	CB0589	13.5	9.6	14.4	18.5
279F	CB0592	4.3	4.2	6	7.6
280V	CB0666	21.6	21.6	30.9	37.5
281J	IS0667	3	4	5.7	6.6
283R	IS3265	27.9	12.6	19.6	26.2
287J	IS0677	27.3	23.1	32.7	40.9
288J	IS0677	41.9	58.8	83.1	103.8
289L	MH0675	10.2	11.1	15.4	18.7
291J	IS0670	1.2	1.9	2.6	3
293W	CB50136	14.5	17.7	24.7	30.3
294W	CB0558	1.2	1.7	2.4	2.6
295X	CB0658	12.1	11.6	16.3	19.6

5.2 Hydraulic Analysis

5.2.1 Existing Condition

Table 5-2 provides important modeling assumptions used for the hydraulic analysis and Appendix F-2 provides the existing condition hydraulic analysis for the 10-, 25- and 50-year storm events.

Table 5-2: OSW Hydraulic Model Assumptions					
System	Upstream Structure ID	Downstream Structure ID	Pipe ID	Street	Assumption
1	CB0587	OS0591	SD0424	Hawthorne Boulevard	The outlet structure was not found during field visits; however, for modeling, it was kept in its original location.
2	CB0761	CB0762	SD2862	Hawthorne Boulevard	The downstream storm drain system was observed to be oriented southwest towards the Robert E Ryan Community Park. It is unknown where this system ends or to which system it may connect.
3	CB0739	MH0741	SD0372	Robert E Ryan Community Park	The diameter information was obtained from the 2014 CCTV was completed. The invert elevations were assumed to follow ground slope and to connect to the upstream and downstream known inverts.
	MH0741	JS13717	SD2865		
	JS13717	MH0734	SD2880		
	MH0734	MH0733	SD2885		
4	JS1901	MH0741	SD2858	Altavista Drive	Used a 42-inch pipe in the model, which is the downstream upstream pipe size. Further research in regards to the proper size needs to be found to ensure that the pipe is functioning properly.

5.2.1.1 Results

The Ocean South West drainage area consists of several storm drain systems. The northeast portion is an area that includes four significantly large canyons. These canyons have slopes of around 20%. The canyons runoff water are tributary to different storm drain systems. Two of these storm drain systems function properly in the 50-year storm event analysis. One receives inflow from McCarrell Canyon and the other one is the canyon immediately east of McCarrell. These two inlets connect to two separate storm drain systems that join at MH3525 at Sea Cove Drive and Seagate Drive. Afterwards this system discharges into the ocean. The other two canyons are the Barkentine canyon and the canyon immediately west of Barkentine. Both canyons drain into the same storm drain inlet structure (IS0677). Downstream this system floods in the 50-year storm event analysis. The system outlets behind the fire station into a natural open channel and then it flows through a culvert under Sea Cove Drive, which drains into the ocean.

Table 5-3 lists the storm drain structures that were found to be flooded for the 10- and 50-year storm event hydraulic analysis. Appendix F-2 provides the existing condition hydraulic analysis for the 10-, 25- and 50-year storm events.

Table 5-3: OSW Flooded Storm Drain Structures		
Storm Drain Structure ID	Floods in 50-Year Storm Event	Floods in 10-Year Storm Event
CB0749	X	X
MH3242	X	
CB0552	X	X
CB1065	X	X
IS40930	X	
MH0554	X	X
IS0549	X	X
GB0674	X	
GB1743	X	X

5.2.2 Recommended Improvements

Table 5-4 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 5-1). The proposed condition hydraulic analysis results are included in Appendix F-3.

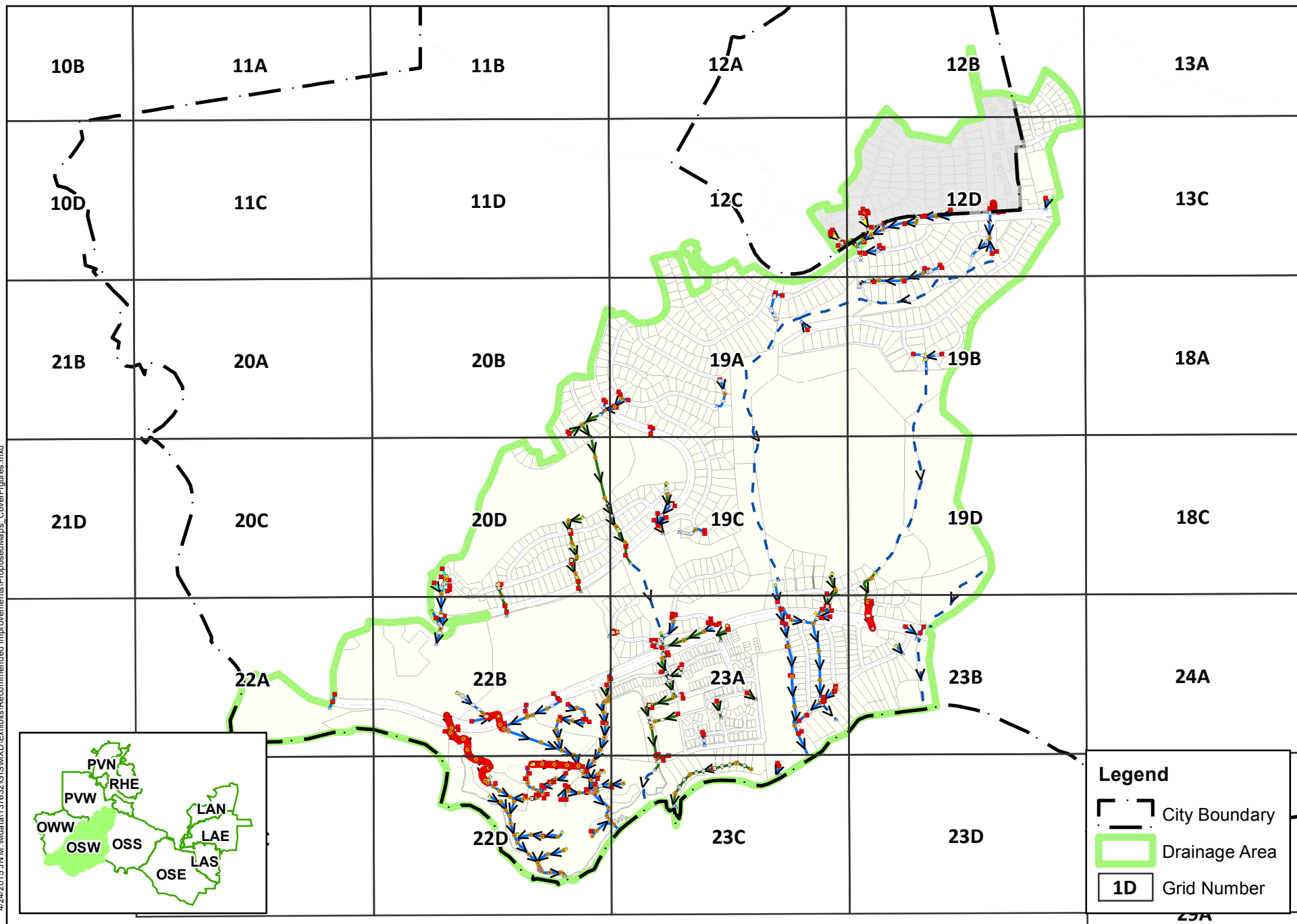
Table 5-4: OSW Pipes to be Improved								
System	Owner	Upstream Structure ID	Downstream Structure ID	Pipe ID	Atlas Map	Existing Size (in)	Proposed Size (in)	Street
1	RPV	GB1743	IS0549	SD3266	22B	30	42	Palos Verdes Drive South
		IS0549	MH41325	SD3002		24	42	
		MH41325	MH13709	SD2999		24	42	
2	LAC	MH0675	GB0674	SD0745	23B	36	48	Arrowroot Lane
		GB0674	OS0673	SD0426		36	48	
3	RPV	CB0552	MH0554	SD2994	22B	18	24	Palos Verdes Drive South Terranea Way
		MH0554	MH0553	SD3001		18	24	
		MH0553	MH25729	SD42740		18	24	
		MH25729	MH36518	SD35532		18	24	
		MH36518	MH36519	SD35533	22D	18	24	
		MH36519	MH25741	SD25547		18	24	
		MH25741	MH36520	SD25560		18	24	
		MH36520	MH25730	SD35534		18	24	
4	RPV	IS40930	JS25771	SD39944	22D	18	24	Terranea Way
		JS25771	MH36522	SD35535		18	24	
		MH36522	MH36523	SD35536		18	24	
		MH36523	MH36521	SD25589		18	24	
		MH36521	MH25770	SD35537		18	24	
5	RPV	CB1065	CB1064	SD1729	12D	24	30	Crest Road
		CB1064	CB1063	SD1730		24	30	

5.2.3 Cost Estimates

Construction cost estimates for this drainage area were completed and the results are shown in Table 5-5. Each improvement project cost was calculated using the procedure discussed in Section 2.5 of this report (see Appendix B-3).

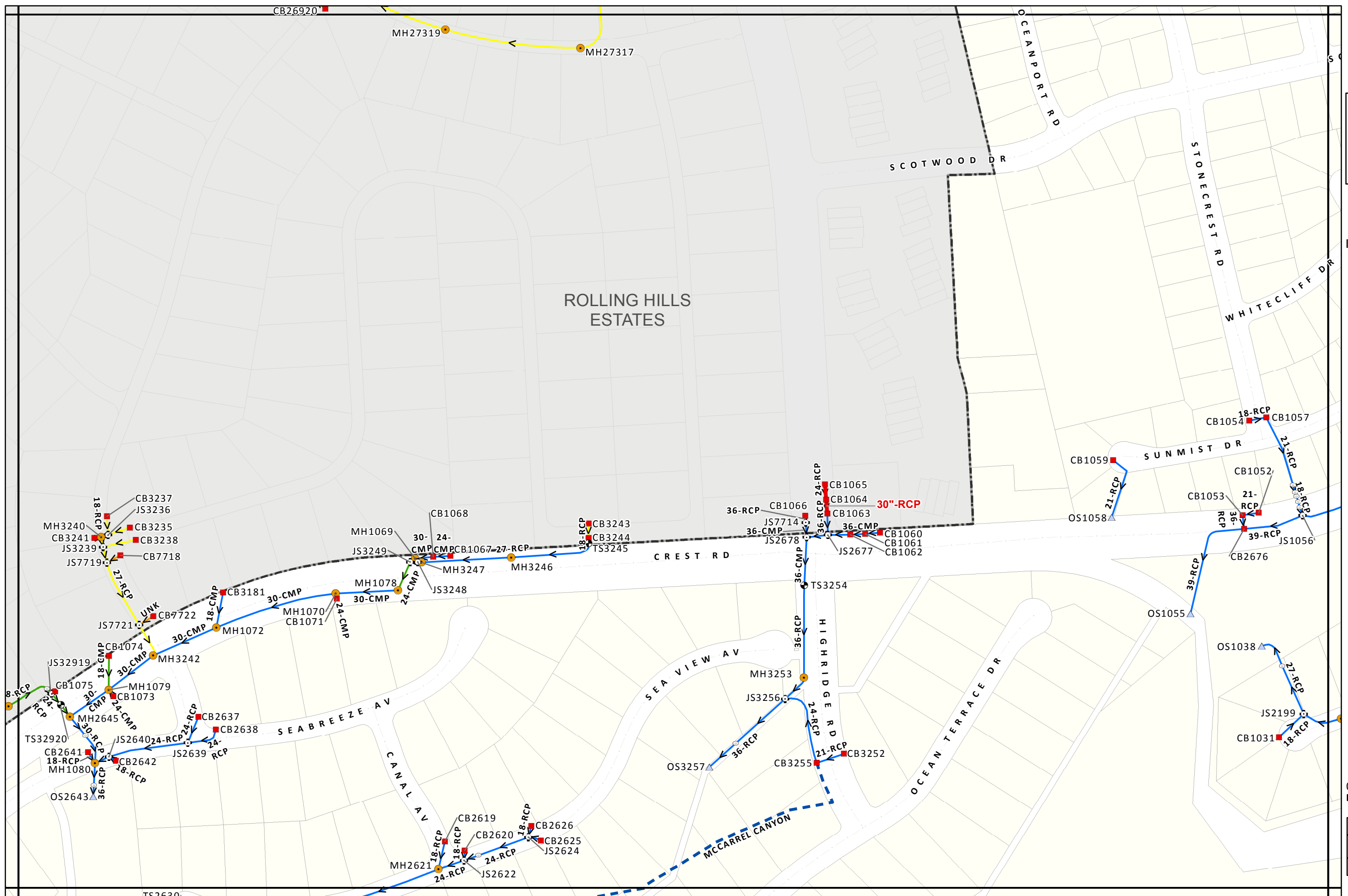
Table 5-5: OSW Total Cost Estimate	
Atlas Map	Total Project Cost
12D	\$41,000
22B	\$269,000
22B & 22D	\$619,000
22D	\$288,000
23B	\$281,000
Total	\$1,498,000

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Storm Water Recommended Improvements

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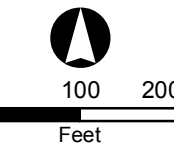
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Storm Water
Recommended
Improvements

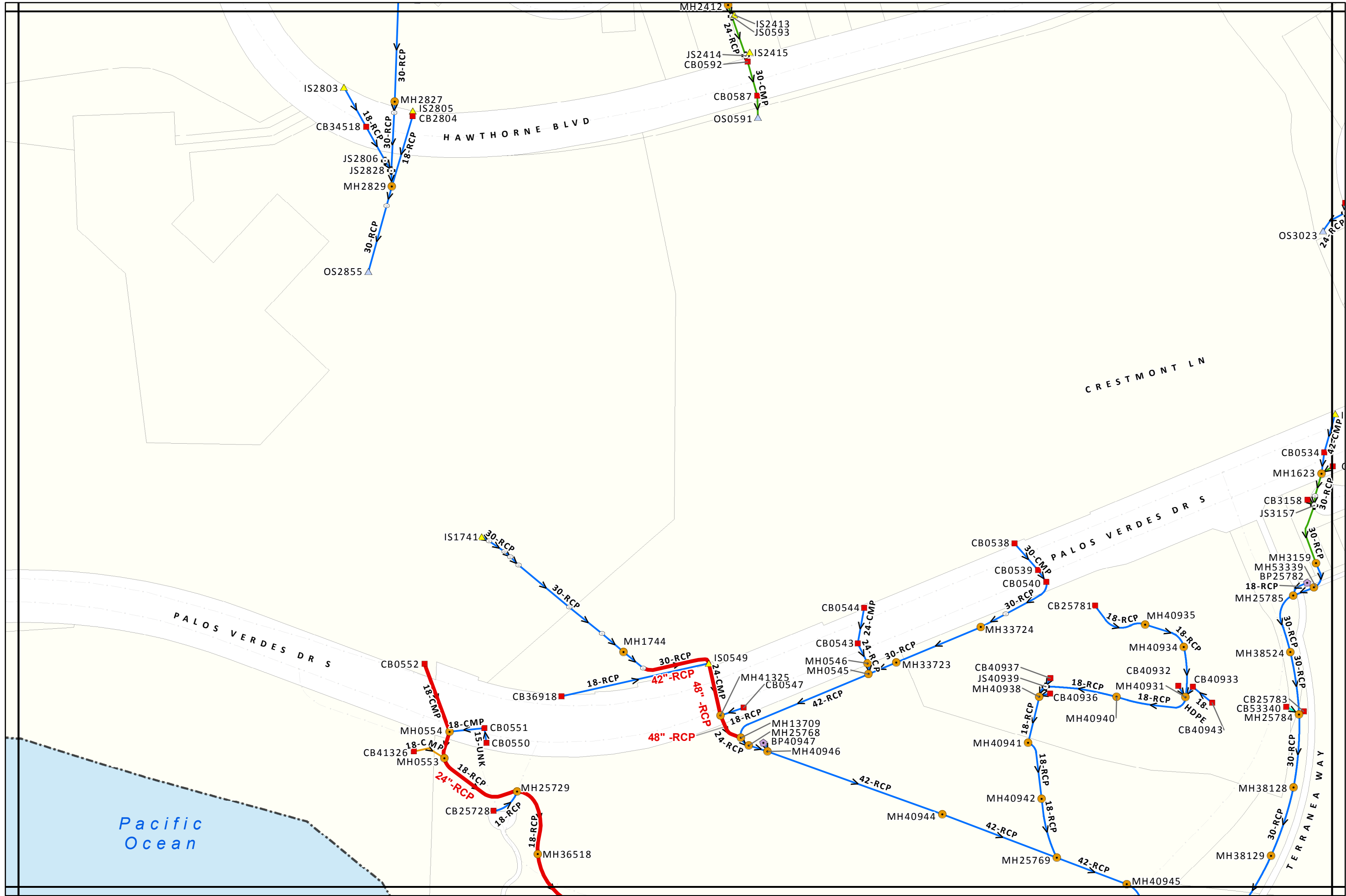
- Catch Basin
- Inlet
- Outlet
- Parkway
Outlet
- Manhole
- Junction
- Transition
- Grade Break
- Storm Filter
and Storm
Gate
- Proposed
Pipe
- Proposed
Size
- Open
Watercourse
- Rancho
Palos Verdes
- Rolling Hills
Estates
- Palos Verdes
Estates

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

City
Boundary



20C	20D	19C
22A	22B	23A
22C	22D	23C

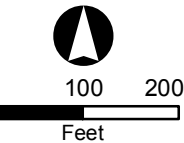




Storm Water
Recommended
Improvements

- 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



19C	19D	18C
23A	23B	24A
23C	23D	24C

