

## City of Pacifica Wet Weather Equalization Basin Site Feasibility Evaluation

**Subject:** Site Alternative 2C and Prioritization Addendum to Site Feasibility Evaluation Report

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## 1 Introduction

In July 2015, RMC prepared an updated version of the Wet Weather Equalization Basin Site Feasibility Evaluation (*2015 Feasibility Evaluation*) for the City of Pacifica (City). The *2015 Feasibility Evaluation* identified multiple potentially feasible locations for a new wet weather equalization basin located in the vicinity of the Linda Mar Pump Station to eliminate capacity-related sanitary sewer overflows. Since that report was completed, a modification to an existing site alternative was identified by City staff as being distinct enough to require separate analysis. The potential benefits of this additional site alternative (referred to as Site Alternative 2C herein) include increased separation from nearby residences and avoidance of pipelines parallel to Highway 1. Additionally, City Staff have re-evaluated internal priorities and developed a new prioritization method to supplement the one presented in the *2015 Feasibility Evaluation*.

The purpose of this Technical Memorandum (TM) is to evaluate the feasibility of the new Site Alternative 2C, update the site alternative prioritization, and describe the City staff's recommended site alternative. This TM is intended to be supplemental to the *2015 Feasibility Evaluation*. Although the *2015 Feasibility Evaluation* suggested that Site Alternative 2C was not preferred to Site Alternative 2B, this was based on high level construction and basin geometry considerations. City Staff have asked RMC to fully develop Site Alternative 2C due to other considerations, such as distance from private residences, and evaluate it against the other site alternatives. Section 2 contains a site analysis for the new site/pipeline alternative comparable to the site analyses in the *2015 Feasibility Evaluation*. Section 3 updates the findings and recommendations of the *2015 Feasibility Evaluation* and compares the new alternative with those developed in the previous evaluation. Section 3 also includes the City staff's recommendation for a site alternative for consideration by the City Council.

After evaluation of the new Site Alternative 2C, it appears that there are four site combinations that best meet the City criteria:

- Site Alternative 1A – West End of Linda Mar Park-and-Ride – This site alternative is the lowest cost option, but requires purchasing a portion of the parcel from Caltrans, who is a willing seller. This site also requires relative short lengths of pipe to divert flow to and pump contents from the basin. The site is bordered on one side by private residences.
- Site Alternative 2B – Skate Park Parking Lot with pipeline alignment that avoids Highway 1 – This site alternative is on a City-owned parcel and is located close to other City facilities. The location of the basin at Site 2B would be farther from private residences than the basin at Site 1A.

The site is far from the flow diversion points, leading to a higher cost, and is relatively constrained from a construction perspective.

- Site Alternative 2C – Upper Skate Park Parking Lot with pipeline alignment that avoids Highway 1 – This site alternative is located within the same parking lot as Site 2B but is located closer to the community center and farther from the private residences to the south. This new alternative is deeper than basins originally envisioned for this parcel therefore the geotechnical boring for this project did not extend deep enough to characterize the full depth required for Site Alternative 2C. Although there are no indications that geotechnical conditions are significantly different than found in the boring conducted at Site 1A (which was bored to 100 feet below ground surface), a new boring will be required at Site 2C to confirm its feasibility should City Council preliminarily select this site.
- Site Alternative 3B – Crespi Parking Lot with pipeline alignment that avoids Highway 1 – This site is on a Caltrans-owned parcel and is far from the diversion point, both of which factor into the site's higher cost. Caltrans is a willing seller. Similar to Site 2B and Site 2C, it is close to other City facilities. It has the fewest access and space restrictions on construction which is considered a benefit. The basin and related facilities would require consultation (but probably not permitting) with the Coastal Commission at a minimum since the site would likely be considered within sight of the coastal zone.

Based on information available and input received at a prior public meeting, City staff have recommended Site 2 for consideration by the City Council. Site 2 is located on City-owned land and is not subject to Coastal Commission oversight. Within Site 2, Site Alternative 2C is preferred over Site Alternative 2B contingent upon geotechnical confirmation. Staff recommend Site Alternative 2C over Site Alternative 2B because it is farther from private residences and has a lower cost estimate.

## 2 Site Analysis

The site analysis below follows the same format as that presented in the *2015 Feasibility Evaluation*. Where the site information or analysis is the same, there may be references to the prior report.

### 2.1 Site Alternative 2C: Upper Skate Park Parking Lot with Pipeline Alignments that Avoid Highway 1

#### Site Introduction

The Site Alternative 2C basin and potential pipeline alignment are shown in Figure 2-1. As can be seen, the site is located near the Pacifica skate park and Community Center on the east side of Highway 1. This site differs from Site Alternative 2B (discussed in the *2015 Feasibility Evaluation*) because the basin location is closer to Crespi Avenue and farther from the nearby residences (approximately 150 feet from basin edge to private fence line for Site Alternative 2C vs 45 feet for Site Alternative 2B). This alternative also uses a pipeline alignment that stays inland of Highway 1 and has two diversions from the collection system, one at Linda Mar Boulevard and one at Arguello Boulevard. It is one of the furthest inland sites (along with Site Alternative 2B and Site Alternative 1A) being considered as a potential basin location. Table 2-1 summarizes the infrastructure characteristics proposed for this site. The sections below summarize key considerations for Site Alternative 2C.

**Table 2-1: Site Alternative 2C Infrastructure Dimensions and Rates**

Parameter	Dimension
Basin Inner Diameter	78 feet
Depth from Ground to: Maximum Water Surface	15 feet
Basin Floor	74 feet
Influent Gravity Pipeline Length/Diameter	1,760 feet/24 inches
Effluent Force main Length/Diameter	450 feet (including vertical pump discharge)/12 inches
Basin Drainage Time/Flow Rate	30 hours/1.7 mgd

Assuming similar timelines as presented in the *2015 Feasibility Evaluation*, construction for Site Alternative 2C is estimated to be complete by the end of June 2018. This is six months ahead of the RWQCB deadline.

The basin drainage time assumes a discharge to the 12-inch sewer in Crespi Drive, which extends across Highway 1 and then parallels the shoreline to the Linda Mar Pump Station. As noted in the *2015 Feasibility Evaluation*, using this line for draining of the equalization basin limits flow to 1.7 mgd during the draining cycle and results in drain times of approximately 30 hours.

The limiting hydraulic capacity of the Crespi Drive sewer is due to pipeline sections with reverse grades that would be costly to correct, and would involve construction permitting from Caltrans and Coastal Commission. Thus, it would be costly and time consuming to increase the capacity of the Crespi Drive sewer to obtain more rapid drain times.



Figure 2-1: Potential Basin Location and Pipeline Alignment at Site Alternative 2C



### **Parcel Size and Suitability**

The basin and non-pipeline facilities would be located in the parking lot and buffer areas between the existing skate park and the fence separating the parking lot from a natural area. The City envisions this site to remain a parking lot, so there does not appear to be any long-term conflict with the current uses. This parcel is zoned for controlled manufacturing and is identified as Public and Semi-Public in the *Pacifica General Plan Public Review Draft*. The planned land use to the south is Park and Mixed Use Center to the east. The basin is compatible with the Public and Semi-Public designation but zoning changes may be needed to site the equalization basin on this parcel.

The parking lot would be closed during construction. Alternate parking would need to be identified to offset the loss of the free, publicly accessible parking during the construction period. The City does not believe that construction and operation of the basin at Site Alternative 2C would impact City revenue.

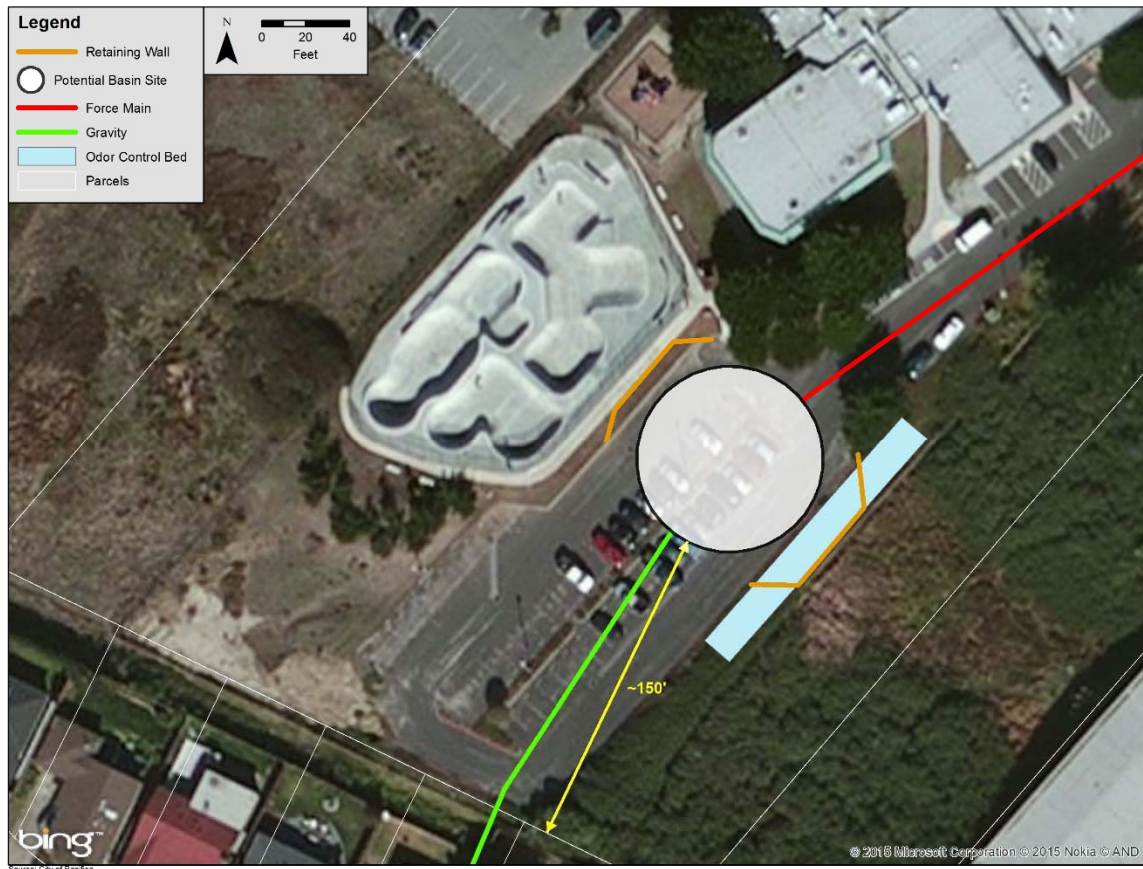
The basin shown in Figure 2-1 assumes an inner diameter of approximately 78 feet and an interior depth of 74 feet. This diameter would require construction of two low height (up to approximately 4 ft) retaining walls to allow construction access to the perimeter of the basin, as shown in Figure 2-2 and Appendix A. One retaining wall would be at the edge of the sidewalk around the skate park and the other retaining wall would be just inside the fence separating the parking lot from the natural area. Figure 2-3 identifies the location of the walls and provides perspective on the height of the wall.

Without these retaining walls, to achieve the needed construction access to the basin perimeter, the inner diameter of the basin would be restricted to approximately 60 feet. This would result in an interior depth of nearly 120 feet, which is considered too deep for practical operations.

The remaining parking lot south of the basin could be used as a staging area for the contractor. To maintain a buffer between the site facilities and the residences, it is envisioned that the odor control bed could be located in the buffer area between the fence and parking lot. Control buildings could be located in the area to the south of the skate park or to the north of the odor control bed.



**Figure 2-2: Site Alternative 2C Basin Location and Retaining Walls**



**Figure 2-3: Proposed Retaining Wall Locations**



### Adjacent Land Uses

Site Alternative 2C is bounded by open space area (current land use) to the east, parking lot and residential structures to the south, the skate park to the west and Community Center complex to the north. There is a large drainage/storm drain between the parking lot on which Site Alternative 2C is located and the residences. A major advantage of Site Alternative 2C over Site Alternative 2B is the additional

distance between the basin and the residences. As shown in Figure 2-2, the offset between the basin and the residential fence line is approximately 150 feet. Even with this offset, construction methods to reduce noise, dust, and other construction impacts should be implemented to reduce the risk of construction claims by neighbors.

Also of note are the adjacent natural areas (to the east and to the southwest of the skate park). Environmental concerns regarding the area to the southwest can be mitigated through normal construction management practices. The natural area to the east is identified by the *Pacifica General Plan Public Review Draft* as the site of Linda Mar Shopping Center. Should the Shopping Center be developed prior to implementation of the basin project, the environmental sensitivity of the area would be diminished. At this time though, it should be assumed that working close to these natural areas may require some additional precautions and biological surveys during the construction period. The property owner of the parcel to the east may also raise objections to the project siting depending on development plans. Although Site Alternative 2C is farther from residences, as mentioned above, construction facilities would be placed at the property line to the east.

### **Parcel Ownership**

This site is owned by the City of Pacifica and therefore would avoid the cost and time involved with land purchase.

### **Geotechnical Considerations**

Please see the *2015 Feasibility Evaluation* for an assessment of the geotechnical considerations. A boring was completed at this site, approximately 100 feet from the Site Alternative 2C basin location, to a depth of 76.5 feet. While this is approximately the same as the operational depth of the basin, the actual depth of construction continues to about 15 feet lower. The boring site and depth were based on the location and depth of the original Site Alternative 2A/Site Alternative 2B basin which took advantage of the widest part of the site so as to minimize basin depth. In moving the basin further from the residences, the available space is more limited resulting in a Site Alternative 2C basin that is deeper than the boring. We cannot determine, based on the information available, the conditions at these depths and strongly recommend that, should Site Alternative 2C be selected as the preferred basin site, a new boring be completed to at least the depth of the proposed construction to confirm the viability of the site at these depths.

### **Pipeline Connections**

Pipeline connections for Site Alternative 2C are comparable to the other pipeline alignments. As shown in Figure 2-1 of this TM, two diversion points from the collection system are required to make this alternative hydraulically feasible. There are several locations where the diversion pipeline would likely cross existing pipelines though it is assumed that the diversion pipeline would be lower than those existing pipelines. There are fewer conflicts than the pipeline alignments shown for Site Alternatives 2A and 3A. There are no Caltrans permits required for this pipeline alignment.

The discharge force main would connect the submersible pump within the basin to the gravity sewer in Crespi Drive. It is assumed at this time that an additional penetration could be made in an existing manhole to create this connection. This will need to be confirmed during design.

### **Coastal Commission Jurisdiction**

Site Alternative 2C and associated pipelines are located east of Highway 1 and would not be visible from Highway 1. Therefore, they would be considered beyond the jurisdiction of the Coastal Commission and will not need a Coastal Development Permit. However, some degree of Coastal Commission consultation will still be needed to obtain their concurrence that they do not have jurisdiction on this project.

### **Ocean Impacts**

Site Alternative 2C is one of the farthest inland sites and is located east of Highway 1. It is therefore considered protected from the effects of sea level rise and is anticipated to have reduced maintenance requirements due to salt and sand compared to other sites that are closer to the ocean.

### **Flooding**

This site is within the 1% annual chance flood. Additionally, City staff have noted previous flooding at this site. To reduce the risk of flooding the basin with stormwater, it is necessary to raise the basin access points or otherwise waterproof them. The cost estimate for this alternative includes a flood protection placeholder estimate of \$100,000.

### **Estimated Project Costs**

The estimated project costs for Site Alternative 2C are presented in Table 2-2. As can be seen in the table, the estimated cost for this project is approximately \$14.9 M.



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**Table 2-2: Total Project Costs for Site Alternative 2C**

Basin & Site Summary						
Tank Inner Diameter	78	Ft	Fill Depth	5	Ft	
Cutter Soil Mix Wall Thickness	30	Inch	Bay Mud/Peat Depth	15	Ft	
Shotcrete Wall Thickness	12	Inch	Native Soil Depth	59	Ft	
Decking Thickness	8	Inch	Total Excavation Depth	79	Ft	
Girder Depth	4.5	Ft				
Access Depth	7	Ft				
Tipping Bucket Depth	2	Ft				
Free Space Depth	1	Ft				
Storage Depth	59	Ft				
Foundation Thickness	5	Ft				
Cutter Soil Mix Cutoff Wall Depth	10	Ft				

Project Element	Category	Sub-Category	Quantity	Unit	Unit Cost	Extended Cost
<b>Basin Structure</b>						
	Basin Walls					
		Cutter Soil Mix Wall	22,242	SF	\$ 20.00	\$ 444,850
		Shotcrete (w/Fiber Reinforcement)	18,011	SF	\$ 12.45	\$ 224,234
		Welded Wire Mesh (6x6 - W4xW4)	180	CSF	\$ 78.50	\$ 14,138
		Smooth Finish	18,011	SF	\$ 0.75	\$ 13,508
	Concrete Base/Plug					
		Concrete/Rebar	931	CY	\$ 195.00	\$ 181,514
	Basin Cover					
		Decking (Concrete)	140	CY	\$ 850.00	\$ 119,094
		Decking (Rebar @ 205 lbs/CY concrete, FDOT)	28,723	LBS	\$ 1.10	\$ 31,595
		Precast/Prestressed I-Girders (AASHTO Type IV)	796	LF	\$ 190.00	\$ 151,240
	Excavation					
		General	14,738	CY	\$ 70.00	\$ 1,031,684
	Anchoring					
		Tiedown Soil Anchors (10' on center)	0	EA	\$ 4,200.00	\$ -
	Spoil Offhaul and Disposal:					
		Fill (Assumes Class III)	1,571	TON	\$ 38.00	\$ 59,690
		Bay Mud/Peat (Assumes Class II)	3,770	TON	\$ 47.00	\$ 177,186
		Native Soil (Assumes Class III)	18,588	TON	\$ 38.00	\$ 706,335
	Elevated Equipment/Access Deck					
		Concrete Perimeter Beams (2@12"x12")	9	CY	\$ 259.00	\$ 2,381
		Angle Support (4.5' @12' OC)	21	EA	\$ 927.00	\$ 19,467
		1.5" Alum. Grating	980	SF	\$ 56.93	\$ 55,801
		C10x4.25 (2)	465	LF	\$ 163.58	\$ 76,057
		Guardrail	217	LF	\$ 106.95	\$ 23,184
	<i>Subtotal</i>					\$ 3,331,958
<b>Basin Appurtenances</b>						
	Pumps		2	EA	\$ 53,000.00	\$ 106,000
	Controls		1	Allowance	\$ 80,000.00	\$ 80,000
	Standby Power		1	Allowance	\$ 150,000.00	\$ 150,000
	Foundation and Fencing		1	Allowance	\$ 64,000.00	\$ 64,000
	Washdown/10' of Header		24	EA	\$ 11,000.00	\$ 264,000
	Odor Control					
		Odor Control Bed (2,025 sf x 6 ft)	1	Allowance	\$ 100,000.00	\$ 100,000
		Ductwork and 2 Fans	1	Allowance	\$ 100,000.00	\$ 100,000
	Miscellaneous Piping		1	Allowance	\$ 80,000.00	\$ 80,000
	<i>Subtotal</i>					\$ 944,000

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(Table 2-2 Continued)

<b>Pipes</b>	Diversion Manhole	2	EA	\$ 10,000.00	\$ 20,000	
	Manhole	7	EA	\$ 10,000.00	\$ 70,000	
	24" Diameter Gravity (Pilot Guided Augur Boring)	150	LF	\$ 900.00	\$ 135,000	
	Boring Pit	2	EA	\$ 100,000.00	\$ 200,000	
	24" Diameter Gravity (Open Cut)	1,610	LF	\$ 480.00	\$ 772,800	
	Interlocking Sheet Piles (12' deep)	38,640	SF	\$ 12.00	\$ 463,680	
	12" Diameter Force Main (Open Cut)	380	LF	\$ 240.00	\$ 91,200	
<i>Subtotal</i>					\$ 1,752,680	
<b>Other</b>	Dewatering (4 sump pumps and treatment)	1	Allowance	\$ 10,000.00	\$ 10,000	
	Contaminated Groundwater Treatment	1	Allowance	\$ 50,000.00	\$ 50,000	
	Retaining Walls and Supplemental Site Work	1	Allowance	\$ 100,000.00	\$ 100,000	
	Paving (Partial New Parking Lot)	2,700	SY	\$ 50.00	\$ 135,000	
	Paving (Force main trench)	127	SY	\$ 50.00	\$ 6,333	
	Paving (Street)	8,889	SY	\$ 50.00	\$ 444,444	
	Sidewalks	160	SF	\$ 5.00	\$ 800	
	Traffic Control	1	Allowance	\$ 53,000.00	\$ 53,000	
	Lot Improvements					
		Install Turf	0	TSF	\$ 400.00	\$ -
		Shrubs (5' OC)	0	EA	\$ 50.00	\$ -
		Flood Protection Measures	1	Allowance	\$ 100,000.00	\$ 100,000
		Utility Relocation	1	Allowance	\$ 500,000.00	\$ 500,000
		Park and Ride Relocation	0	Allowance	\$ 100,000.00	\$ -
<i>Subtotal</i>					\$ 1,399,578	
<b>Construction Subtotal</b>					\$ 7,428,216	
<b>Contractor Costs</b>	Mobilization/Demobilization		% of Const. Subtotal	5%	\$ 371,411	
	Contractor Overhead and Profit		% of Const. Subtotal	15%	\$ 1,114,232	
	Change Order Allowance		% of Const. Subtotal	5%	\$ 371,411	
<i>Subtotal</i>					\$ 1,857,054	
<b>Professional Services</b>	Environmental Documentation/Permitting	1	Allowance	\$ 350,000.00	\$ 350,000	
	Engineering		% of Const. Subtotal	10%	\$ 742,822	
	Legal		% of Const. Subtotal	2%	\$ 148,564	
	Construction Management		% of Const. Subtotal	10%	\$ 742,822	
<i>Subtotal</i>					\$ 1,984,208	
<b>Design and Construction Contingency</b>	Subtotal of Above				\$ 11,269,478	
			% of Project Subtotal	25%	\$ 2,817,369	
<i>Subtotal</i>					\$ 14,086,847	
<b>Real Estate Costs</b>	Property Acquisition	0	SF	\$ 40.00	\$ -	
	Property Sale	0	SF	\$ (40.00)	\$ -	
<i>Subtotal</i>					\$ -	
Total (10/2013 Dollars)	CCI = 9,689				\$ 14,100,000	
Total (6/2016 Dollars)	CCI = 10,238 (Projected)				\$ 14,900,000	

Note: Estimate does not include cost for land acquisition. It is assumed that this City-owned parcel is available for this project.

Please note that the same unit costs were used in this TM as for the 2015 Feasibility Evaluation.

## **3 Findings and Recommendations**

### **3.1 Site Findings**

This evaluation has identified an additional equalization basin site alternative that is considered preliminarily feasible. A brief summary of each site, highlighting the most significant advantages and disadvantages and information discussed in the previous sections is provided in Table 3-1. The table also includes, for ease of comparison, information presented in the *2015 Feasibility Evaluation* for Site Alternative 1A, Site Alternative 2A, Site Alternative 2B, Site Alternative 3A, Site Alternative 3B, and Site Alternative 4. Note that ‘Principal Disadvantages’ and ‘Permitting’ have been updated for Site Alternative 3A and Site Alternative 3B since the *2015 Feasibility Evaluation* based on recent information.





**Table 3-1: Summary of Findings and Costs for Shortlisted Sites**

Item	Site Alternative 1A	Site Alternative 2A	Site Alternative 2B	Site Alternative 2C	Site Alternative 3A	Site Alternative 3B	Site Alternative 4
<b>Location</b>	Linda Mar Blvd. Park and Ride Lot – West end of parcel	Skate Park Parking Lot with Pipelines Crossing and Parallel to Highway 1	Skate Park Parking Lot with Pipeline Alignments that Avoid Highway 1	Upper Skate Park Parking Lot with Pipeline Alignments that Avoid Highway 1	Crespi Parking Lot with Pipelines Crossing and Parallel to Highway 1	Crespi Parking Lot with Pipeline Alignments that Avoid Highway 1	Linda Mar Pump Station Parking Lot
<b>Principal Advantage(s)</b>	<ul style="list-style-type: none"> <li>Inland of Highway 1 so basin is protected from sea level rise and outside of the Coastal Commission review zone.</li> <li>Relatively far from the shoreline so facilities are less exposed to ocean impacts such as salt and sand.</li> <li>Relatively close to the diversion point and very close to the discharge point, reducing pipeline installation cost and impacts.</li> <li>New pipelines would not need to cross Highway 1.</li> <li>Least impact to existing use of all of the sites during construction due to total area available for parking and bus operation</li> </ul>	<ul style="list-style-type: none"> <li>Inland of Highway 1 so basin is protected from sea level rise and outside of the Coastal Commission review zone.</li> <li>Relatively far from the shoreline so facilities are less exposed to ocean impacts such as salt and sand.</li> </ul>	<ul style="list-style-type: none"> <li>Inland of Highway 1, so basin is protected from sea level rise and outside of the Coastal Commission review zone.</li> <li>Relatively far from the shoreline so facilities are less exposed to ocean impacts such as salt and sand.</li> <li>Relatively far from privately owned structures and residences reducing the chance of negative perception and claims.</li> <li>New pipelines would not need to cross Highway 1.</li> </ul>	<ul style="list-style-type: none"> <li>Inland of Highway 1, so basin is protected from sea level rise and outside of the Coastal Commission review zone.</li> <li>Relatively far from the shoreline so facilities are less exposed to ocean impacts such as salt and sand.</li> <li>Relatively far compared to Site 2B from privately owned structures and residences reducing the chance of negative perception and claims.</li> <li>New pipelines would not need to cross Highway 1.</li> </ul>	<ul style="list-style-type: none"> <li>Inland of Highway 1, so basin is protected from sea level rise and outside of the Coastal Commission review zone.</li> <li>Relatively far from the shoreline so facilities are less exposed to ocean impacts such as salt and sand.</li> <li>Relatively far from privately owned structures and residences reducing the chance of negative perception and claims.</li> <li>Potentially improved revenue generation due to avoided lease cost.</li> </ul>	<ul style="list-style-type: none"> <li>Inland of Highway 1 so basin is protected from sea level rise and outside of the Coastal Commission review zone.</li> <li>Relatively far from the shoreline so facilities are less exposed to ocean impacts such as salt and sand.</li> <li>Relatively far from privately owned structures and residences reducing the chance of negative perception and claims.</li> <li>Potentially improved revenue generation due to avoided lease cost.</li> <li>New pipelines would not need to cross Highway 1.</li> </ul>	<ul style="list-style-type: none"> <li>Locates basin on same site as Linda Mar Pump Station.</li> <li>Relatively far from privately owned structures and residences reducing the chance of negative perception and claims.</li> <li>Relatively close to diversion point, reducing pipeline installation costs and impacts.</li> </ul>
<b>Principal Disadvantage(s)</b>	<ul style="list-style-type: none"> <li>Smaller site which may increase cost due to inconvenience to contractor.</li> <li>Close to privately owned structures and residences increasing the chance of negative perception and claims.</li> <li>General plan designation as mixed use and potential loss of revenue due to limited future site use.</li> </ul>	<ul style="list-style-type: none"> <li>Smaller site which may increase cost due to inconvenience to contractor.</li> <li>Close to privately owned structures and residences increasing the chance of negative perception and claims.</li> <li>Relatively far from the diversion point, increasing pipeline installation costs and impacts.</li> <li>Loss of free Community Center parking during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Smaller site which may increase cost due to inconvenience to contractor.</li> <li>Relatively far from the diversion point, increasing pipeline installation costs and impacts.</li> <li>Loss of free Community Center parking during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Relatively constrained site which may increase cost due to inconvenience to contractor.</li> <li>Relatively far from the diversion point, increasing pipeline installation costs and impacts.</li> <li>Loss of free Community Center parking during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Relatively far from the diversion point, increasing pipeline installation costs and impacts.</li> <li>Most impact to existing use of all of the sites during construction because of the multiple amenities that are associated with this parking lot and the relatively high usage.</li> <li>City would own the natural area next to the parking lot per Caltrans communications.</li> </ul>	<ul style="list-style-type: none"> <li>Relatively far from the diversion point, increasing pipeline installation costs and impacts.</li> <li>Most impact to existing use of all of the sites during construction because of the multiple amenities that are associated with this parking lot and the relatively high usage.</li> <li>City would own the natural area next to the parking lot per Caltrans communications.</li> </ul>	<ul style="list-style-type: none"> <li>West of Highway 1, exposing basin to the effects of sea level rise and putting the basin within the Coastal Commission review zone. Sea level rise and coastal erosion could lead to early replacement of basin.</li> <li>Flood protection for this site may introduce additional project scrutiny from the Coastal Commission.</li> <li>Closest site to shoreline so facilities are the most exposed to ocean impacts such as salt and sand.</li> </ul>
<b>Site Ownership</b>	Caltrans	City	City	City	Caltrans	Caltrans	City
<b>Owner Willing to Sell?</b>	<ul style="list-style-type: none"> <li>Willing to subdivide parcel and sell west end to City.</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable as this property is City-owned.</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable as this property is City-owned.</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable as this property is City-owned.</li> </ul>	<ul style="list-style-type: none"> <li>Yes, conditional on determination of stewardship of gifts and historic markers.</li> </ul>	<ul style="list-style-type: none"> <li>Yes, conditional on determination of stewardship of gifts and historic markers.</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable as this property is City-owned.</li> </ul>





Item	Site Alternative 1A	Site Alternative 2A	Site Alternative 2B	Site Alternative 2C	Site Alternative 3A	Site Alternative 3B	Site Alternative 4
<b>Permitting</b>	<ul style="list-style-type: none"> <li>Avoids Caltrans and Coastal Commission permitting</li> </ul>	<ul style="list-style-type: none"> <li>Permit from Caltrans required for Highway 1 crossing.</li> <li>Coordination and possible permit from the Coastal Commission for diversion pipeline.</li> <li>Avoids Coastal Commission permitting for basin<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>Avoids Caltrans and Coastal Commission permitting</li> </ul>	<ul style="list-style-type: none"> <li>Avoids Caltrans and Coastal Commission permitting</li> </ul>	<ul style="list-style-type: none"> <li>Permit from Caltrans required for Highway 1 crossing.</li> <li>Coordination and possible permit from the Coastal Commission for diversion pipeline.</li> <li>Avoids Coastal Commission permitting for basin<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>Avoids Caltrans and Coastal Commission permitting<sup>a</sup></li> </ul>	<ul style="list-style-type: none"> <li>Basin would require review and likely permitting from the Coastal Commission for basin, pipelines, and associated facilities.</li> </ul>
<b>Construction Completion Date<sup>b</sup></b>	<ul style="list-style-type: none"> <li>Construction estimated to be complete on 6/30/2018</li> <li>6 months prior to regulatory requirement</li> </ul>	<ul style="list-style-type: none"> <li>Construction estimated to be complete on 12/31/2018</li> <li>0 months prior to regulatory requirement</li> </ul>	<ul style="list-style-type: none"> <li>Construction estimated to be complete on 6/30/2018</li> <li>6 months prior to regulatory requirement</li> </ul>	<ul style="list-style-type: none"> <li>Construction estimated to be complete on 6/30/2018</li> <li>6 months prior to regulatory requirement</li> </ul>	<ul style="list-style-type: none"> <li>Construction estimated to be complete on 12/31/2018</li> <li>0 months prior to regulatory requirement</li> </ul>	<ul style="list-style-type: none"> <li>Construction estimated to be complete on 6/30/2018</li> <li>6 months prior to regulatory requirement</li> </ul>	<ul style="list-style-type: none"> <li>Construction estimated to be complete on 6/30/2019</li> <li>6 months after regulatory requirement</li> </ul>
<b>Other Considerations</b>	<ul style="list-style-type: none"> <li>This site is relatively close to existing and past gas stations, increasing the risk for soil contamination.</li> <li>This site has a joint use as a bus station that may need to be relocated during construction based on final siting.</li> <li>Unknown timeframe for acquisition.</li> </ul>	<ul style="list-style-type: none"> <li>This site would require construction under and next to a natural area. This could lead to additional environmental precautions.</li> <li>Basin requires more than one day to empty due to current sewer capacity restrictions.</li> </ul>	<ul style="list-style-type: none"> <li>This site would require construction next to a natural area. This could lead to additional environmental precautions.</li> <li>Basin requires more than one day to empty due to current sewer capacity restrictions.</li> </ul>	<ul style="list-style-type: none"> <li>Supplemental deep boring to approximately 100 feet required to achieve equal geotechnical confidence as other site alternatives.</li> <li>Property owner of parcel to the east may have objections based on unknown development plans.</li> <li>This site would require construction next to a natural area. This could lead to additional environmental precautions.</li> <li>Basin requires more than one day to empty due to current sewer capacity restrictions.</li> </ul>	<ul style="list-style-type: none"> <li>This site would require construction next to a natural area. This could lead to additional environmental precautions.</li> <li>Basin requires more than one day to empty due to current sewer capacity restrictions.</li> <li>Unknown timeframe for acquisition.</li> </ul>	<ul style="list-style-type: none"> <li>This site would require construction next to a natural area. This could lead to additional environmental precautions.</li> <li>Basin requires more than one day to empty due to current sewer capacity restrictions.</li> <li>Unknown timeframe for acquisition.</li> </ul>	<ul style="list-style-type: none"> <li>This site may require additional geotechnical work to prepare the ground for construction.</li> <li>Basin requires more than one day to empty due to current sewer capacity restrictions.</li> </ul>



Item	Site Alternative 1A	Site Alternative 2A	Site Alternative 2B	Site Alternative 2C	Site Alternative 3A	Site Alternative 3B	Site Alternative 4
<b>Basin Dimensions (internal)</b>	81 ft diam x 70 ft depth	95 ft diam x 55 ft depth	95 ft diam x 55 ft depth	78 ft diam x 74 ft depth	100 ft diam x 52 ft depth	100 ft diam x 51 ft depth	100 ft diam x 51 ft depth
<b>Basin Cost</b>	\$3.4M	\$3.7M	\$3.7M	\$3.3M	\$3.8M	\$3.8M	\$3.8M
<b>Associated Improvements Cost</b>	\$2.1M	\$4.0M	\$4.0M	\$4.1M	\$4.0M	\$4.2M	\$2.0M
<b>Professional Services and Contractor Costs</b>	\$2.9M	\$4.0M	\$4.0M	\$3.8M	\$4.0M	\$4.1M	\$3.1M
<b>Contingency</b>	\$2.1M	\$2.9M	\$2.9M	\$2.8M	\$3.0M	\$3.0M	\$2.2M
<b>Land and Replacement Costs</b>	\$1.8M	\$0	\$0	\$0	\$2.2M	\$2.2M	\$6.0M <sup>c</sup>
<b>Estimated Total Project Cost, in 2013\$<sup>d, e</sup></b>	<b>\$12.3M</b>	<b>\$14.5M</b>	<b>\$14.6M</b>	<b>\$14.1M</b>	<b>\$16.9M</b>	<b>\$17.3M</b>	<b>\$17.1M</b>
<b>Estimated Total Project Cost in 2016\$<sup>f</sup></b>	<b>\$13.0M</b>	<b>\$15.3M</b>	<b>\$15.4M</b>	<b>\$14.9M</b>	<b>\$17.9M</b>	<b>\$18.3M</b>	<b>\$18.1M</b>

Footnotes:

<sup>a</sup> City experience has been that Coastal Commission does not require consultation or permits for projects east of Highway 1.

<sup>b</sup> See Attachment D in *2015 Feasibility Evaluation* for additional detail regarding project schedule input provided by City Staff.

<sup>c</sup> Cost reflects estimated abandonment and replacement cost due to sea level rise at this location.

<sup>d</sup> Estimated total project cost may not reflect sum of above components due to rounding errors.

<sup>e</sup> Costs reflect the same unit costs as originally estimated in 2013 for previous draft versions of the *2015 Feasibility Evaluation*.

<sup>f</sup> Costs in 2016 \$ reflect inflation escalation to a presumed mid-point of construction of June 2016





### 3.2 Site Comparisons

The matrix shown below in Table 3-2 quantifies how well each site meets the evaluation criteria used in this analysis. Rather than a detailed ranking of sites, project tiers are presented to focus attention on those sites that best meet the City’s technical criteria while recognizing the high level nature of this assessment. The criteria and scoring system are described in the *2015 Feasibility Evaluation*. As can be seen in the weightings presented in Table 3-2, the following criteria are considered to be primary drivers in identifying they top tier alternatives:

- *Long-term Impact to Residents and Local Amenities,*
- *Construction Impact to Residents and Local Amenities,*
- *Willing Landowner,*
- *Vulnerability to Sea Level Rise and Flooding,*
- *Cost, and*
- *Schedule*

**Table 3-2: Site Tier Decision Matrix**

Criteria	Weighting Factor	Relative Importance	Site Alternatives						
			1A	2A	2B	2C	3A	3B	4
Long-term Impact to Residents and Local Amenities	4	12%	-1	0	0	1	1	1	1
Construction Impact to Residents and Local Amenities	4	12%	1	-1	-1	-1	0	-1	0
Willing Landowner	4	12%	1	2	2	2	1	1	2
Vulnerability to Sea Level Rise and Flooding	4	12%	0	0	0	0	1	2	-2
Cost	4	12%	2	1	1	1	0	-1	-1
Schedule*	4	12%	1	0	1	1	0	1	-2
Compatibility with Existing and Planned Landuse	1	3%	-1	1	1	1	1	1	2
Impact on City Revenue	2	6%	0	0	0	0	-1	-1	0
Permitting	3	9%	1	-2	1	1	-2	0	-2
Exposure to Salt and Sand Impacts	1	3%	2	2	2	2	1	1	-1
Geotechnical Considerations	2	6%	2	2	2	2	2	2	1
Sum of Weighting Factors	33	100%							
Constructable			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Score			24	9	22	26	10	16	-11
Tier			1	2	1	1	2	1	2

\* Schedule ratings based on input provided by City staff and included in Attachment D of the *2015 Feasibility Evaluation*.

Based on the evaluation of the sites against the identified criteria, the following alternatives appear to provide the best combination of benefits for the City:

- Site Alternative 1A,
- Site Alternative 2B,
- Site Alternative 2C, and
- Site Alternative 3B

To further evaluate and ‘short-list’ these top tier alternatives, City staff have created an additional scoring matrix, shown in Table 3-3. This matrix compares sites using criteria particularly important to the City as well as some criteria not reflected in the matrix shown in Table 3-2. In the site prioritization matrix below, site alternatives are rated one through four for each criteria, with four indicating the best

achievement of the criterion and one indicating the poorest achievement of the criterion. As can be seen in Table 3-3, Site Alternative 2B and Site Alternative 2C have both scored highest.

**Table 3-3: Site Prioritization Matrix**

Criteria	Site 1A	Site 2B	Site 2C	Site 3B
Completion Date / Degree of City Control Over Schedule	2	3	3	1
Total Project Cost	4	2	3	1
Distance to Residences (Further is Favorable)	1	2	3	4
Ease of Basin Maintenance	2	3	2	4
Pipe and Basin Maintenance	4	2	2	1
Avoidance of Wetlands Maintenance	4	3	3	1
Preservation of Parking and Transportation Amenities	1	4	3	2
Total	18	19	19	14

### 3.3 Discussion of Recommended Project Sites

Based on the comparison provided above, there are four top tier project site/pipeline alignment combinations:

- **Site Alternative 1A** – West End of Linda Mar Park-and-Ride;
- **Site Alternative 2B** – Skate Park Parking Lot with Pipeline Alignments that Avoid Highway 1;
- **Site Alternative 2C** – Upper Skate Park Parking Lot with Pipeline Alignments that Avoid Highway 1; and
- **Site Alternative 3B** – Crespi Parking Lot with Pipeline Alignments that Avoid Highway 1.

Site Alternative 1A has the lowest project cost due to the simpler, shorter pipeline connections associated with these sites. For similar reasons, long term operations and maintenance will likely be easier as well.

Site Alternative 2B and Site Alternative 2C are \$2.4 million (2016\$) and \$1.9 million (2016\$) respectively more expensive than the least cost project alternative (Site Alternative 1A), but are on City-owned land and are farther away from residences than Site Alternative 1A.

Site Alternative 3B is the farthest site from residential neighbors. This benefit reflects the feedback received at a prior public meeting where the general sentiment from attendees was that the basin should be located as far as possible from private residences. Additional capital expenditure on longer pipelines and land purchase is required to achieve this benefit.

Of these four site alternatives, City staff recommends that the City Council select Site 2 as the location for the equalization basin recommended in the October 2011 *Collection System Master Plan*. Within Site 2, the preferred alternative would be Site Alternative 2C, contingent upon the findings of an exploratory geotechnical boring to the construction depth of this alternative.

Advantages of Site 2 include:

- No requirement to acquire additional land for the basin, basin appurtenances, or pipelines. This reduces schedule uncertainty and avoids associated land acquisition costs; and

- No requirement to consult with or obtain a permit from the Coastal Commission. This reduces schedule uncertainty and reduces project cost.

Advantages of Site Alternative 2C over Site Alternative 2B include:

- Farther basin distance from private residences (approximately 150 feet vs. approximately 45 feet). This is consistent with feedback obtained during a public meeting.
- Lower estimated cost. While additional factors may be identified during design, it appears that the City may save approximately \$500,000 by selecting Site Alternative 2C instead of Site Alternative 2B.

The relatively restricted footprint of Site Alternative 2C compared to Site Alternative 2B is considered a disadvantage. The smaller surface area available at the Site Alternative 2C basin location makes construction more difficult, especially due to limited access, and it drives the basin deeper to achieve the required storage volume. This greater depth limits pump selection and potentially creates the perception of a more hazardous work environment.

As suggested above, some additional geotechnical work is required to confirm the recommendation for Site Alternative 2C. The boring at Site 2 was completed to a depth appropriate for Site Alternative 2B but is not deep enough to confirm sub-surface conditions at Site Alternative 2C. This is because Site Alternative 2C was identified and evaluated to be feasible only after the boring was complete and results in basin construction that would be approximately 16 feet deeper than contemplated for Site Alternative 2B. It is recommended that a boring be completed at the basin location of Site Alternative 2C to an appropriate depth to achieve the same confidence in that basin location as the others. This geotechnical information should be obtained at the start of design, should Site Alternative 2C be selected by the City. Should the test boring show that the basin location is infeasible, the City can implement the project at Site Alternative 2B.

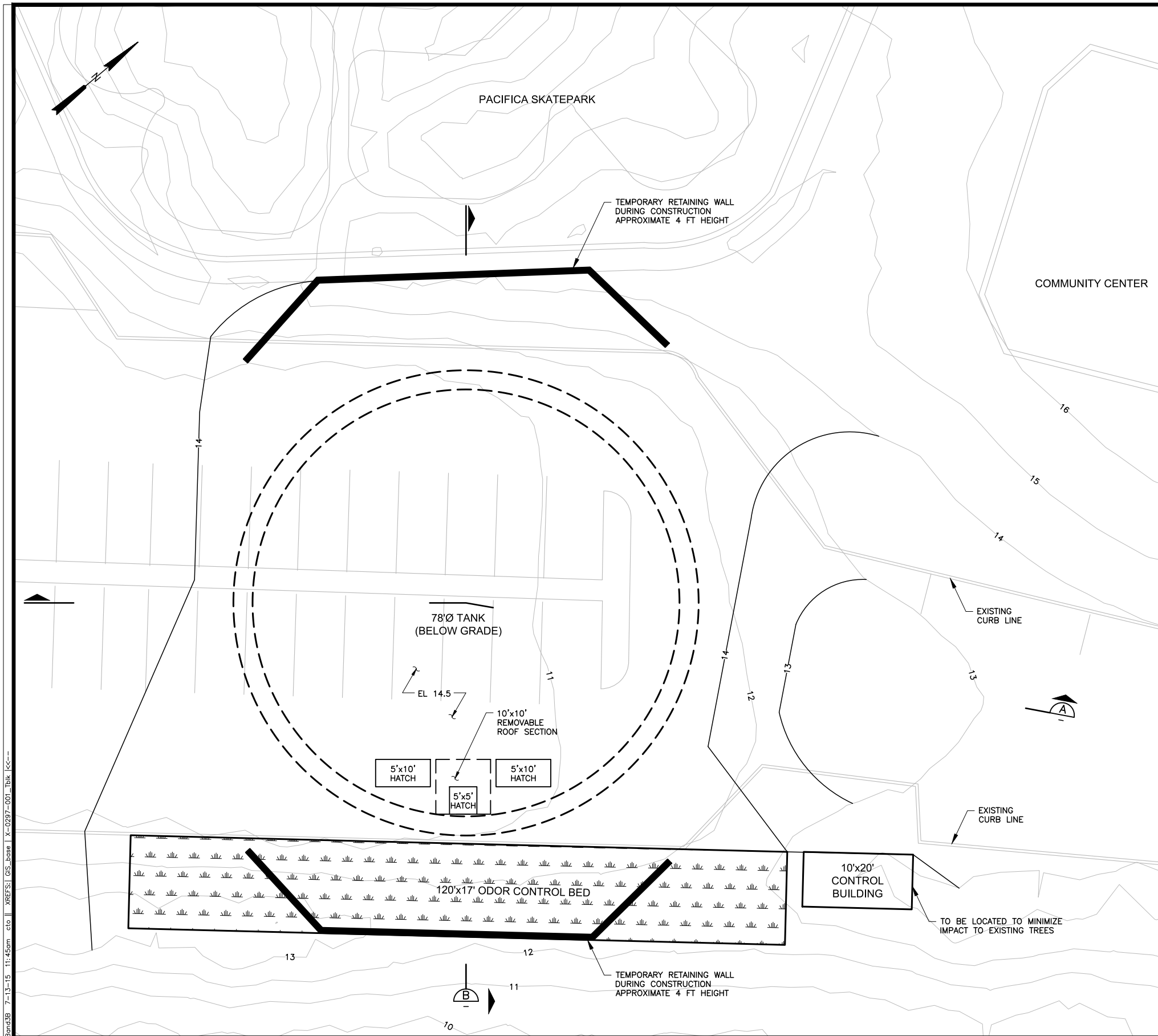




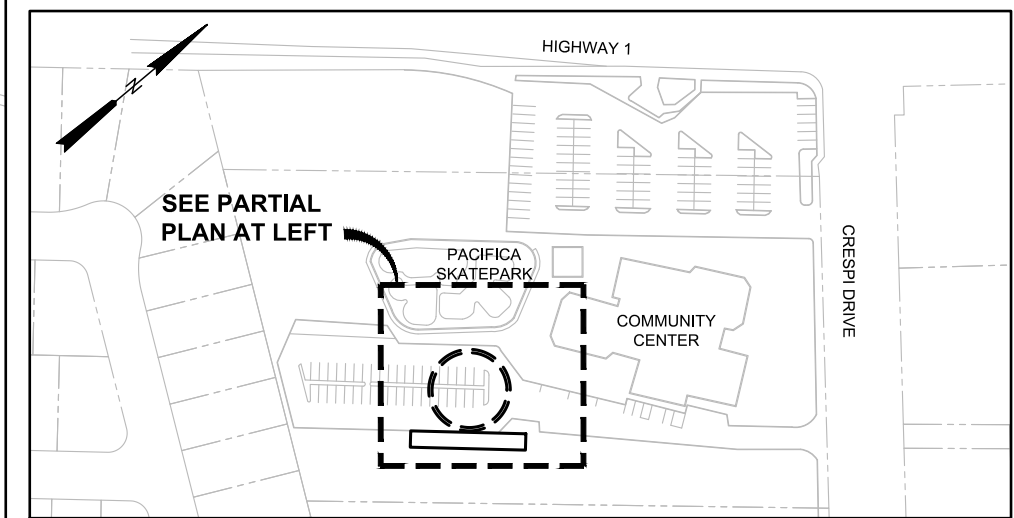
**Appendix A – Surface Layout Figure for Site Alternative 2C**

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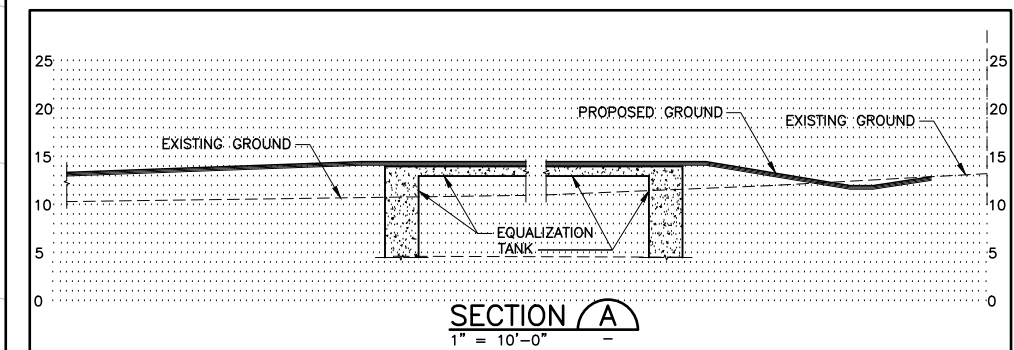




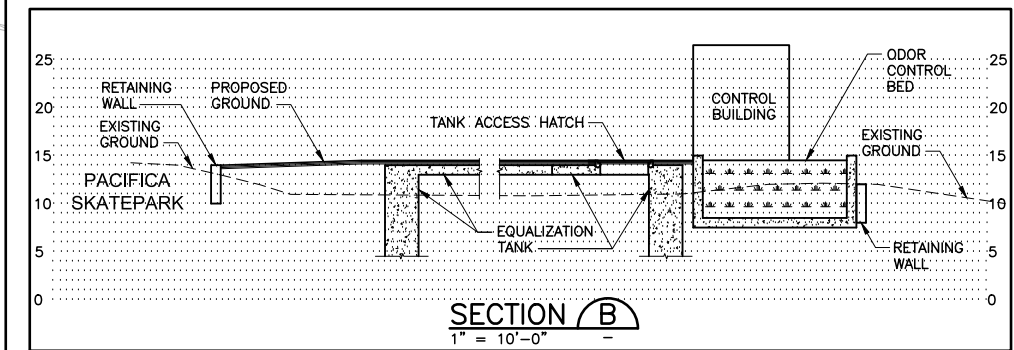
**PARTIAL SITE PLAN**  
1" = 10'-0"



**KEYPLAN**  
1" = 100'-0"



**SECTION A**  
1" = 10'-0"



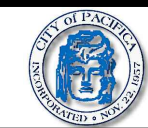
**SECTION B**  
1" = 10'-0"

FILENAME: 0297-001-Fig-28end3B 7-13-15 11:45am cto XREFS: GIS\_base X-0297-001.tbl cto

0" = 1" — VERIFY SCALES — BAR IS ONE INCH LONG ON FULL SIZE DRAWING. IF NOT ONE INCH LONG ON THIS DRAWING, ADJUST SCALES ACCORDINGLY

<b>RMC</b> Water and Environment				DESIGNED	SUBMITTED:
REV	DATE	BY	APVD	DESCRIPTION	RMC PROJ ENGR C
					APPROVED:
					RMC ENGR C

DESIGNED	SUBMITTED:
DRAWN	RMC PROJ ENGR C
CHECKED	APPROVED:
	RMC ENGR C



WET WEATHER EQUALIZATION BASIN SITE FEASIBILITY EVAL.  
**SITE 2C**  
**EQUALIZATION BASIN**  
**PLAN AND SECTIONS**

DWG NO	
SHEET NO	OF
PROJ NO	0297-001
DATE	July 2015