

Technical Evaluation of Potential Public Access
Alignments for the Giacomini Wetland Restoration Project
Part II: Technical Feasibility Study

4.0 CONCLUSIONS

4.1 SUMMARY

Creating suitable public access alignments and improvements in conjunction with the Giacomini Wetlands Restoration Project will be a very challenging undertaking. Most of the alignment study area is in potential wetlands, or at least in areas of riparian vegetation, except for road shoulders of varying and typically limited width. The preferred standard for a public path would be at least 8 feet wide with a paved surface and well-separated from roadways, however this would have extensive construction area/potential wetland impact, would require extensive and expensive construction, and would be inconsistent in some respects with local resident's preferences. Local residents' prefer a narrower, +/- 6' wide less formally improved pathway, such as a compacted decomposed granite surface (D.G.).

Issues of access for persons with disabilities and general use and safety standards dictate that the conceptual pathway design is wider than 6' in many locations, with a paved or boardwalk surface except where the trail would provide only recreational access. The concept design evaluated in this study is a compromise and combination of trail improvement types, including several alternatives, to aid in the detailed evaluation of environmental impacts of public access, while presenting a potentially realistic model for public access alternatives that include reasonable compromises between safe and useful public access, wetlands impacts, land use impacts, and construction cost.

The selection of the best alternatives and decisions about which alignments should be implemented will be based on weighing the interests and responsibilities of the National Park Service, the environmental and land use impacts of the alternatives, the access interests of local residents, property owners, and the general public; and the willingness/ability of Caltrans, and particularly Marin County to cooperatively plan and implement improvements that address these issues; and the ability of the agencies to fund the improvements.

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4.2 CONSTRUCTION COSTS

Table 4-1: Summary of Trail Alignment Costs

Trail Segments	TOTAL	TOTAL (w/ guardrail)
Alignment 1a	\$ 1,139,349	\$ -
Alignment 2c	\$ 1,593,855	\$ -
Alignment 2e	\$ 24,625	\$ -
Alignment 2d	\$ 11,518	\$ -
Sub-Alignment 4a-I	\$ 256,067	\$ -
Sub-Alignment 4a-II	\$ 819,649	\$ -
Sub-Alignment 4a-III	\$ 333,466	\$ -
Sub-Alignment 4a-IV		
Total w/ Option 1 (fill slopes)	\$ 392,229	\$ 435,981
Total w/ Option 2 (retaining walls)	\$ 486,496	\$ 595,946
Total w/ Option 3 (cantilevered boardwalk - Cond. C has retaining walls)	\$ 568,688	\$ 608,211
Sub-Alignment 4a-V		
Total w/ Option 1 (fill slopes)	\$ 260,421	\$ 368,864
Total w/ Option 2 (retaining walls)	\$ 594,540	\$ 884,142
Total w/ Option 3 (cantilevered boardwalk - Cond. C has retaining walls)	\$ 794,109	\$ 923,948
Alignment 4b	\$ 998,251	\$ -
Alignment 4c		
Total w/ Option 1 (fill slopes)	\$ 690,816	\$ 836,988
Total w/ Option 2 (retaining walls)	\$ 1,052,028	\$ 1,380,203
Total w/ Option 3 (cantilevered boardwalk - Cond. C has retaining walls)	\$ 1,239,131	\$ 1,416,962
Alignment 4d		
Total w/ Option 1 (fill slopes)	\$ 729,476	\$ 858,579
Total w/ Option 2 (retaining walls)	\$ 950,147	\$ 1,198,172

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Table 4-2: Summary of Potential Construction Area Impacts

	Total Square Footage for Impacted Area	3'W Construction Access Impact Area	Total Square Footage of Construction Impact	Total Square Footage of Construction Impact w/ Optional Guardrail
Alignment 1a	10,225	6,195	16,420	
Alignment 2c	55,630	18,906	76,867	
Alignment 2e	15,072	7,536	22,608	
Alignment 4a				
Sub-Alignment 4a-I	14,568	7,359	21,927	
Sub-Alignment 4a-II	2,080	1,500	3,580	
Sub-Alignment 4a-III	400	150	550	
Sub-Alignment 4a-IV				
Total w/ Option 1 (fill slopes)	7,588	3,687	11,275	12,313
Total w/ Option 2 (retaining walls)	4,160	3,687	7,847	8,885
Total w/ Option 3 (cantilevered boardwalk - Cond. C has retaining walls)	3,900	3,687	7,587	8,625
Sub-Alignment 4a-V				
Total w/ Option 1 (fill slopes)	18,814	4,932	23,746	26,930
Total w/ Option 2 (retaining walls)	8,411	4,932	13,343	16,527
Total w/ Option 3 (cantilevered boardwalk - Cond. C has retaining walls)	7,615	4,932	12,547	15,731
Alignment 4b	17,944	6,729	24,673	
Alignment 4c				
Total w/ Option 1 (fill slopes)	27,662	9,831	37,493	42,070
Total w/ Option 2 (retaining walls)	15,898	9,831	25,729	26,747
Total w/ Option 3 (cantilevered boardwalk - Cond. C has retaining walls)	15,161	9,831	24,992	25,767
Alignment 4d				
Total w/ Option 1 (fill slopes)	22,203	8,997	31,200	38,693
Total w/ Option 2 (retaining walls)	14,075	8,997	23,072	30,051

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Table 4-3: Summary of Trail Alignment Maintenance Costs

Item	Annual Cost
Alignment 1a	
A. Pre-fabricated Fiberglass Bridge 35'x6'	\$1,312
B. Elevated Boardwalk – 5' wide, 2025'	\$21,058
Subtotal Alignment 1a	\$22,371
Alignment 2c	
A. Weather-Dependant Informal Path, 2035'	\$979
B. Low Boardwalk, 3289'	\$38,281
C. Improved All-Weather Path – 6' Wide, D.G./Pine Resin Binder Surface (per 500 l.f.)	\$1,427
Subtotal Alignment 2c	\$40,687
Alignment 2d (Road functions as path, maintenance assumed to be assigned to roads budget)	
Maintain/replace signs and gates	\$209
Alignment 2e	
Weather-Dependant Informal Path, 2011'	\$979
Alignment 4a	
A. Improved All-Weather Path – 6' Wide, D.G./Pine Resin Binder Surface, 5349' (Condition A, B, C)	\$15,022
B. Concrete Retaining Walls w/48" Vinyl Coated Chain Link Fence, 1928' (Condition C, D, and E assuming retaining wall option)	\$5,587
C. Improved All-Weather Path – 6' Wide, D.G./Pine Resin Binder Surface, 1906' (Condition D, E assuming retaining wall option)	\$5,504
D. Cantilevered Boardwalk – 6' wide (1489' Condition D assuming boardwalk option - delete path item above)	\$13,984
E. Cantilevered Boardwalk – 8' wide, 417' (Condition E assuming boardwalk option - delete path item above)	\$4,421
F. Cantilevered Boardwalk – 8' wide (486' Condition F boardwalk)	\$8,867
G. Pre-Fabricated Steel Bridge 200' long	\$12,850
H. Pre-fabricated Fiberglass Bridge 35'x6'	\$1,312
I. Pre-fabricated Fiberglass Bridge 50'x6'	\$2,302
Subtotal Alignment 4a with fill slopes (option 1)	\$45,857
Subtotal Alignment 4a with retaining wall (option 2)	\$51,444
Subtotal Alignment 4a with boardwalk (option 3)	\$58,758
Alignment 4b	
Elevated Boardwalk – 8' wide, 2243' long	\$26,095
Alignment 4c	
A. Improved All-Weather Path – 6' Wide, D.G./Pine Resin Binder Surface, 1185' (condition A, B, C)	\$3,277
B. Concrete Retaining Walls w/48" Vinyl Coated Chain Link Fence, 1871' (Condition C, D, and E assuming retaining wall option)	\$5,450
C. Improved All-Weather Path – 6' Wide, D.G./Pine Resin Binder Surface, 1474' (Condition D, E assuming retaining wall option)	\$4,571
D. Cantilevered Boardwalk – 6' wide, 1085' (Condition D assuming boardwalk option - delete path item above)	\$10,654
E. Cantilevered Boardwalk – 8' wide, 389' (Condition E assuming boardwalk option - delete path item above)	\$4,032
F. Elevated Boardwalk – 8' wide, 618' (behind Lucchesi and Kostelic properties)	\$8,887
Subtotal Alignment 4c with fill slopes (option 1)	\$16,735
Subtotal Alignment 4c with retaining wall (option 2)	\$22,186
Subtotal Alignment 4c with boardwalk (option 3)	\$26,850
Alignment 4d	
A. Improved All-Weather Path – 8' Wide, A.C. Surface, 472' (from B Street to Levee Road)	\$3,370
B. Improved All-Weather Path – 6' Wide, D.G./Pine Resin Binder Surface, 1782' (Condition A, C)	\$5,236
C. Concrete Retaining Walls w/48" Vinyl Coated Chain Link Fence, 1456' (Condition C, D, and E assuming retaining wall option)	\$4,454
D. Improved All-Weather Path – 6' Wide, D.G./Pine Resin Binder Surface, 674' (Condition D, E assuming retaining wall option)	\$2,843
E. Cantilevered Boardwalk – 6' wide, 616' (Condition D assuming boardwalk option - delete path item above)	\$6,860
F. Cantilevered Boardwalk – 8' wide, 58' (Condition E assuming boardwalk option - delete path item above)	\$993
Green Bridge assumed to be part of Caltrans maintenance	-
G. Pre-fabricated Fiberglass Bridge 35'x6'	\$1,312
H. Pre-fabricated Fiberglass Bridge 50'x6'	\$2,302
Subtotal Alignment 4d with fill slopes (option 1)	\$15,064
Subtotal Alignment 4d with retaining wall (option 2)	\$19,518
Total with Fill Slopes (Option 1)	\$167,997
Total with Retaining Wall (Option 2)	\$183,489
Total with Boardwalk (Option 3)	\$175,949