TORREY PINES ROAD PRELIMINARY ENGINEERING STUDY

FOR

PROJECT SCHEDULING

By

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I. TOPIC DESCRIPTION

In this study, scheduling of the improvement project along Torrey Pines Road between Prospect Place and La Jolla Shores Drive is being evaluated to identify efficient and effective segments and scheduling sequences using monetary and non-monetary criteria. Improvements will include road widening, retaining wall, guardrail, fences, repaving, striping, etc. Within the project area there must be a certain level of scheduling to minimize community impacts and properly budgeting the project, while effectively completing the work and protecting public safety.

II. PROJECT SCHEDULING

II.1. Why Project Scheduling?

Torrey Pines Road is a congested alignment; the road is the primary means of access to the La Jolla Village area, a highly desirable visitor destination and business hub, and the surrounding area is the location of numerous residences. Public safety requires that the work be properly staged and sequenced for least impact to motorists and to maintain the highest level of public safety, this generally means that a detour that involves little change and is in use for a longer time is safer for the commuter since he can become accustomed to the change in alignment and therefore travel through the work area in a safer manner. This does not relieve the contractor of his obligation to provide traffic control that notifies the traveler well in advance of a temporary realignment of the road. In addition, local residents usually want work completed as soon as possible.

Improvements to this corridor will involve use of features to enhance the local environment which can be costly, therefore scheduling the project so it is constructed over a somewhat longer time period will stagger funding allowing the project to be properly budgeted by the City without significantly affecting other important public improvements in the city.

II.2. Standards for Scheduling

Scheduling road improvements should consider scheduling portions of the project with the highest crash incidents and keeping traffic control transitions back to existing roadways out of areas of high crash incident. Crash incident data was not available to TCE at the time of this report however the final design engineer should request this information for this purpose.

Another criterion is effective scheduling of the segments. For example, if there are areas of right of way that must be acquired from local resident's property, these segments should be performed last or later to provide time for right of way acquisition (temporary or permanent easement or right of way in fee).

Scheduling of segments should consider affects by ongoing litigation that should allow for settlement of the litigation and conclusion of the verdict before progressing with the affected segment construction.

The City established a standard for the project to limit each project segment to $5 Million to allow for proper funding. The costliest project features are the retaining wall units. The road is located above and below expensive homes close to the alignment and geology is challenging, containing active and inactive faults that in some areas result in soil sloughing off of the bluff, therefore retaining walls of varying cost are necessary. A discussion of the geologic hazards is shown in the Report of Geotechnical Reconnaissance as part of the documentation for this project.

II.3. Scheduling Criteria

Scheduling can be flexible however ideally there should be as few segments as possible while satisfying criteria. The following criteria were evaluated in this study:

- **Community Impacts**
- **Financing Constraints**

II.3.1. Community Impacts

The community usually wants the project complete as soon as possible so they can return to their normal routines. The project is best constructed such that as many issues as possible are addressed in this project and future capital improvements construction in the alignment will not take place for a long time. Important to the scheduling of the work is that construction should be scheduled to provide construction of all improvements in the same area at the same time, that advocates a more controlled project area of work. These goals advocate scheduling where work is efficiently carried out to complete all work quickly; a good contractor's construction sequence usually addresses completion ASAP since the contractor is motivated to complete work as quickly and efficiently as possible. As is the case on City of San Diego projects, the work is inspected for quality assurance and quality control.

Safety

The goal of the conceptual design is to improve the safety of the community and to meet the City's standards and requirements for safety

During construction, the design engineer should prepare the bid documents to protect the public's health and safety concerns.

The design engineer shall materialize all applicable standards and requirements on the contract documents so that after construction, all of the constructed work shall meet the City's safety requirements and standards

Traffic

The Traffic engineer for traffic control will make every attempt minimize traffic disturbances. When necessary the traffic engineer may design lane closures, however they shall avoid traffic detours because of the high Average Daily Traffic loads on Torrey Pines Road. Traffic loads on this road cannot be safely diverted to any local street. In all circumstances the construction of all segments will, more or less, create some traffic impacts. Therefore scheduling will be grouped separately for each section of road so that the work will not have to impact the community in the same area again and again.

Noise

To minimize noise impacts, the construction work is best performed during working hours. However for the same reason as described in traffic above, the scheduling should be grouped by alignment segment so the same resident doesn't have to be impacted by the construction noise over several construction periods.

Aesthetics

This conceptual design takes consideration of preserving the view corridor, retaining the prestige of the area and preserving the natural character of the area to the fullest extent possible

II.3.2. Financing Constraints

Monetary constraints were initially set by City staff at approximately $5 Million per segment for construction. Given this requirement, TCE prepared a construction cost estimate for the project elements. During development of the cost estimate, TCE based unit costs on City standard unit costs, Caltrans bid costs from actual projects and ebidboard costs for local projects. The cost estimate also was adjusted to local area costs for the La Jolla area and was reviewed by local contractors.

Costs exceed $5 Million on two segments primarily because of proposed retaining walls on the south side of the road. As a result of high costs for several walls, TCE utilized costs to define segments. The cost estimate assumes known project elements applying average construction costs within the last 2 years from the date of issuance of this study. A contingency of 30% was added to the subtotal of estimated costs to account for items such as overhead and profit, taxes, items not considered in conceptual design that would be selected in detailed design, etc.

Segment	Estimated Conceptual Construction Cost
1	$5.5 Million
2	$5.0 Million
3	$5.4 Million
4	$4.7 Million

II.4. Segment Locations

After development of the cost estimate, TCE evaluated costs to define how the project should be segmented (the engineer's conceptual cost estimate is attached in Appendix A). Segments were defined based on estimated costs and identified as follows:

Segment	Stationing	Description
1	10+00 – 16+80	From the intersection of Prospect St. to Coast Walk
2	16+80 – 29+50	From the intersection of Coast Walk to Viking Way/Hillside Dr.
3	29+50 – 35+00	From the intersection of Viking Way/Hillside Dr. to 200 feet west of Little St.
4	35+00 – 53+00	200 feet west of Little St intersection to La Jolla Shores Drive

Costs were proportioned to keep construction costs of segments at approximately $5 Million. This does not include costs for contract administration, planning, design, land acquisition, or operations and maintenance. The location of each segment is shown on Figure 1.

III. PRIORITIZATION OF SEGMENTS

Project sequencing is equally important and different criteria must be considered in selection of the most attractive sequence of completing the selected segments. The criteria identified are as follows:

- **Level of Achievement**
- **Scheduling of Long Lead Items**
- **Urgency of Safety Improvements**

The three criteria were used to prioritize segments 1, 2, 3 and 4. Each segment has a score for each criterion based on the scoring system. Each segment will be scored from 1 to 10 with one being a low score and ten being the best. The criteria each have different weighted factors. The one that is more important has a higher weighted factor and the less important criterion has a lower weighted factor. Each weighted factor ranges from 1 to 5. The final score for each segment is the product of the score and the weighted factor.

III.1. Level of Achievement

Segment 4 contains over 40% of the project alignment length and the cost of this segment is lower in cost than all the other segments so the segment may be completed more quickly. Completion of this segment would provide the community with a sense that the project is progressing well and would give the community the opportunity to use a large portion of improved roadway more quickly. The community would likely be more appreciative when longer sections are improved. Segments are ranked based on length of the segment relative to segment 4 (1800 feet) as follows:

Segment	Score	Notes
1	4	This segment is approximately 680 feet long
2	7	This segment is the second longest segment (1270 feet) in the project. It should be constructed second based on this criterion.
3	3	This segment is the shortest length at 550 feet.
4	10	This is the longest segment on the project and should be constructed as soon as possible based on this criterion. Completion of this segment would show significant project progress.

III.2. Scheduling of Long Lead Items

On this project, several locations will require acquisition of permanent right of way, permanent or temporary easements . Property acquisition efforts frequently delay projects because of the time required to identify, assess, and obtain approvals for work in those areas. Therefore property acquisition must be identified as early in the project as possible so proper project scheduling can take place. On Torrey Pines Road, right of way is limited so TCE identified the following locations where potential work outside the limits of the right of way may be required. TCE estimated the area of land acquisition as adequate to place retaining walls within ROW. TCE limited the right of way (ROW) area to control costs and protect the adjacent homeowner from potential future power lines, water lines or other utilities in the new ROW nearer their home. As a result of installing the wall, improvement of the adjacent homeowner's land has been accomplished by signature approval of an agreement to perform the work prior to improvements at no additional cost for land acquisition or easements.

No.	Approximate Stations	Segment	Approximate Land Acquisition, ft^2	Description
1	12+80 to 13+25	1	380	For retaining wall on embankment side of road
2	15+50 to 16+60	1	1,620	For retaining wall on cut side of road
3	17+80 to 20+80	2	3,950	For retaining wall on cut side of road
4	22+70 to 25+50	2	3,270	For retaining wall on cut side of road
5	30+70 to 33+50	3	2,300	For retaining wall on cut side of road

West of Amalfi St. intersection, pending litigation between an adjacent homeowner and the City on the south side of the road should be completed before proceeding with work in that area. Pending litigation is alleged for slope stabilization along the cliff area above Torrey Pines Road.

As described in the evaluation above there are several impacts that could impact segments 1, 2 and 3. These include acquisition of easement or right of way in these segments. Based on the discussion above, the segments would be ranked as follows.

Segment	Score	Notes
1	6	Two locations will require acquisition of right of way or easement therefore this may take longer than a segment with one area to acquire.
2	4	There is pending litigation related to a portion of the roadway in this segment. Time required resolving litigation can be longer than easements or right of way acquisition. The segment has two areas requiring easement or right of way acquisition.
3	8	Only one affected area is located in this segment that would require easement or right of way acquisition. Therefore it may be faster to obtain agreements and start this segment.
4	10	This segment is clear of pending litigation as well as easements or right of way required to be acquired prior to construction.

III.3. Urgency of Safety Improvements

Safety improvements reduce risks to the community by installing traffic barriers for protection of pedestrians and potential of accident risks. TCE's evaluation of the segments is presented in the table below.

Segment	Rank	Notes
1	8	This segment contains guardrail along the sweeping curve on the north side of the road. This guardrail is required because a steep embankment on the outside of the curve presents a hazard. The guardrail would protect pedestrians accessing Coast Walk. Coast Walk is a walking area with sweeping coastline views.
2	10	A guardrail is proposed to protect pedestrians on the north side of the road across from the intersection with Amalfi St. An accident was reported to occur where a vehicle crossed the road and ran off the embankment at this location.
3	5	There are no guardrails in this segment and this segment is in the middle of the alignment and short in length (same approximate length as segment 1). No significant improvements to improve safety that aren't also included in other segments.
4	5	There is no guardrail in this segment. No significant improvements to improve safety that aren't also included in other segments.

IV. Conclusions and Recommendations

A Summary of the segments with weighted factors is provided below. Weighted factors were selected based on the importance to the project. Safety takes precedence. Secondary is scheduling lead items because time constraints for acquisition of the property could hold up construction of the affected project segment. Third community sensitivity, or completing the longest segment work first, is considered because it was most likely that completion of segment 4 which has the greatest positive impact to the community would most likely be constructed first.

Criteria	Weighted Factors	Segment			
		1	2	3	4
Level of Achievement	3	4	7	3	10
Scheduling of Long Lead Items	4	6	4	8	10
Urgency of Safety Improvements	5	8	10	5	5
TOTALS		76	87	66	95

TCE's final order of ranking of the segments in the table above has a good chance of providing the least impacts to the community, provide appropriate time for getting long lead items completed and install safe improvements timely. **From the perspective of retaining wall construction, the walls should be constructed within segment construction to minimize community disturbance.** Therefore the sequence for retaining wall construction is recommended to correspond with each segment's prioritization.

Figure 1 below shows an illustration of the arrangement of segments in the project alignment.

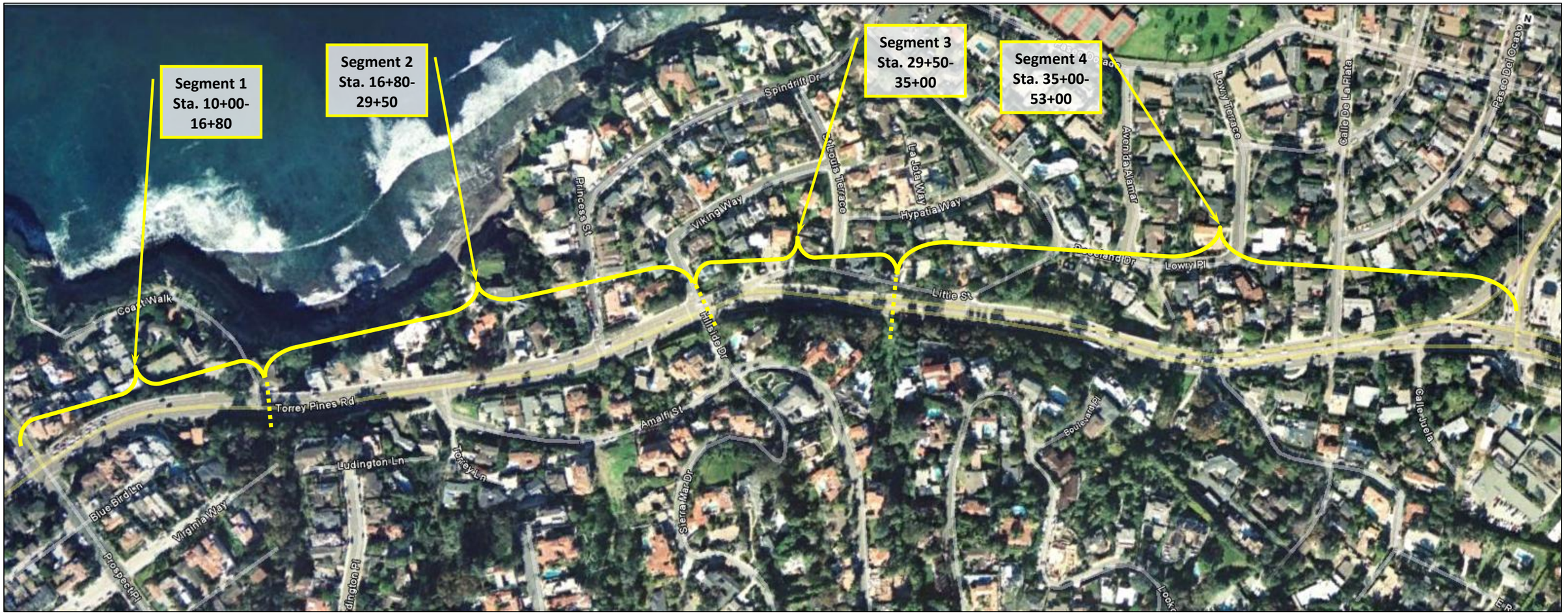

FIGURE 1

Aerial View of Project Showing Conceptual Locations of Segments

(Yellow lines represent locations of proposed segments; Line locations are approximate)

APPENDIX

A. TORREY PINES ROAD CONCEPTUAL COST ESTIMATE

TORREY PINES ROAD CONCEPTUAL COST ESTIMATE

DESCRIPTION	QTY	UNIT	$/UNIT	TOTAL	Approximate Cost Breakdown per Segment: Segment 1 Sta. 10+00-16+80	Segment 2 Sta. 16+80-29+50	Segment 3 Sta. 29+50-35+00	Segment 4 Sta. 35+00-53+00
Mobilization/ Demobilization	1	LS	$600,000	$600,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000
Bond and Field Orders	1	LS	$1,000,000	$1,000,000	$ 152,809	$ 285,393	$ 123,596	$ 438,202
Stormwater Control Measures	1	LS	$1,154,000	$1,154,000	$ 176,342	$ 329,344	$ 142,629	$ 505,685
Remove & Dispose AC Pavement	17,500	SF	$4	$70,000	$ 10,697	$ 19,978	$ 8,652	$ 30,674
Cold Mill Pavement	9,100	LF	$3	$23,660	$ 3,615	$ 6,752	$ 2,924	$ 10,368
Asphalt Concrete Pavement Overlay	294,000	SF	$3	$882,000	$ 134,778	$ 251,717	$ 109,011	$ 386,494
Remove & Dispose of Sidewalk	17,200	SF	$2	$36,120	$ 5,519	$ 10,308	$ 4,464	$ 15,828
Sidewalk per G-7	35,500	SF	$6	$227,200	$ 34,718	$ 64,841	$ 28,081	$ 99,560
Remove and Dispose of Curb and Gutter	7,700	LF	$3	$25,410	$ 3,883	$ 7,252	$ 3,141	$ 11,135
Curb and Gutter Type G	8,400	LF	$24	$203,280	$ 31,063	$ 58,015	$ 25,124	$ 89,078
Remove and Dispose of Retaining Walls (shotcrete)	11,675	SF	$10	$116,750	$ 63,000	$ 7,500	$ -	$ 46,250
Remove and Dispose of Retaining Walls (Cement Block)	1,300	SF	$10	$13,000	$ -	$ 13,000	$ -	$ -
Retaining Wall Sta. 12+80-16+00 Soil Nail w/concrete façade	6,800	SF	$350	$2,380,000	$ 2,380,000	$ -	$ -	$ -
Retaining Wall Sta. 15+50-16+60 Soil Nail w/concrete façade	1,500	SF	$350	$525,000	$ 525,000	$ -	$ -	$ -
Retaining Wall Sta. 17+80-20+80 Soil Nail w/concrete façade	5,100	SF	$350	$1,785,000	$ -	$ 1,785,000	$ -	$ -
Retaining Wall Sta. 22+70-25+50 SDRSD C-11 Wall	2,100	SF	$150	$315,000	$ -	$ 315,000	$ -	$ -
Retaining Wall Sta. 27+80-29+10 SDRSD C-11 Wall	1,000	SF	$150	$150,000	$ -	$ -	$ 150,000	$ -
Soil Nail Wall Sta. 30+00-34+90	10,600	SF	$200	$2,120,000	$ -	$ -	$ 2,120,000	$ -
Retaining Wall Sta. 30+00-34+90 SDRSD C-11 w/façade	6,560	SF	$150	$984,000	$ -	$ -	$ 984,000	$ -
Soil Nail Sta. 35+80-37+50	3,830	SF	$200	$766,000	$ -	$ -	$ -	$ 766,000
Retaining Wall Sta. 35+80-37+50 SDRSD C-11 w/façade	2,640	SF	$150	$396,000	$ -	$ -	$ -	$ 396,000
Station 41+50-43+50 SDRSD C-2 block retaining wall	900	SF	$40	$36,000	$ -	$ -	$ -	$ 36,000
Station 45+00-45+80 SDRSD C-2 block retaining wall	600	SF	$40	$24,000	$ -	$ -	$ -	$ 24,000
Pavement Striping Removed	26,500	LF	$3.75	$99,375	$ 15,185	$ 28,361	$ 12,282	$ 43,546
Pavement Striping and Grooving Pavement	27,000	LF	$1.20	$32,400	$ 4,951	$ 9,247	$ 4,004	$ 14,198
Excavation	1,000	CY	$50	$50,000	$ 7,640	$ 14,270	$ 6,180	$ 21,910
Pedestrian Ramps	28	EA	$2,000	$56,000	$ 12,000	$ 14,000	$ 8,000	$ 22,000
Traffic Control	1	LS	$900,000	$900,000	$ 200,000	$ 200,000	$ 200,000	$ 300,000
Guardrail	650	LF	$300	$195,000	$ 132,000	$ 63,000	$ -	$ -
Trees	175	EA	$2,000	$350,000	$ 53,483	$ 99,888	$ 43,258	$ 153,371
Relocate Street Lights	6	EA	$10,000	$60,000	$ 20,000	$ 20,000	$ 10,000	$ 10,000
Relocate Water line AVAR valves & blowoff assemblies	5	EA	$10,000	$50,000	$ -	$ 20,000	$ -	$ 30,000
Fence: Parapet and Plexiglas type	650	LF	$230	$149,500	$ 92,000	$ 57,500	$ -	$ -
Fence: Wood and Metal fence	900	LF	$30	$27,000	$ -	$ -	$ 9,000	$ 18,000
Privacy Fence	60	LF	$50	$3,000	$ -	$ -	$ -	$ 3,000
	Subtotal All Items			$15,804,695	$ 4,208,684	$ 3,830,365	$ 4,144,347	$ 3,621,299
	Contingency		30%	$4,741,409	$1,262,605	$1,149,110	$1,243,304	$1,086,390
	Total			$20,546,104	$5,471,289	$4,979,475	$5,387,651	$4,707,689
Construction Cost Grand Total (rounded to nearest $100,000)				**$20,500,000**	**$5,500,000**	**$5,000,000**	**$5,400,000**	**$4,700,000**
Additional Project Costs:			Planning	$500,000	$125,000	$125,000	$125,000	$125,000
			Design, Construction Management & Administration	$3,800,000	$1,000,000	$900,000	$1,000,000	$900,000
			Land Acquisition Administration	$200,000	$100,000	$100,000	$0	$0
			Land Acquisition @ $120/Square Foot and 11600 sq. ft.	$1,400,000	$700,000	$400,000	$300,000	$0
			TOTAL	$26,446,104				
TOTAL PROJECT COSTS (rounded to nearest $100,000)				**$26,500,000**	$7,400,000	$6,500,000	$6,800,000	$5,700,000

Notes:

1 Trees include retaining wall plantings and irrigation systems, root barriers, and 1 year maintenance contract. Assumes corrosion proof attachments insect/decay resistant trellis. Trellis will be from 4' to 15' height however cost is an average.
2 Retaining wall height from Coastal Comission and City Department of Planning and Land Use
3 Estimate excludes retaining wall constructed by others at approx. stations 37+40 - 40+70
4 Soil Nail wall costs are based on the difference between the $350/sf wall with soil nails and the $150/SF SDRSD C-11 retaining wall without soil nails
5 4-foot wide sidewalk is assumed for the project. Remaining available width to be utilized for parkway strip behind sidewalk.
6 Land Acquisition assumes 2000 sq ft Segment 1, 7220 sq ft Segment 2, and 2300 sq ft Segment 3.
7 Land acquisition administration or effort to acquire land is based on the estimated no. of properties affected.
8 Design and Administration includes costs for detailed design, bidding and awarding contract, and City construction management and office management during design
9 Land acquisition costs were based on actual real estate prices averages of $100 per foot. A 20% contingency was added.

APPENDIX A