Monroe Heights Street Configurations

DRAFT Technical Memorandum

City of Riviera Beach Public Works Department

1481 15th Street
Riviera Beach, Florida 33404

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December 10, 2019

CMA Project No. 221.017

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Exhibits

1 Introduction

The City of Riviera Beach Public Works Department (City) recently conducted infrastructure improvements within the Monroe Heights Neighborhood (see Exhibit A for project location). The infrastructure improvements consisted of water main, sewer main, drainage, roadway and sidewalk. The City has requested that Chen Moore and Associates (CMA) provide this technical memorandum to present conceptual alternative roadway designs and project costs for public review and input.

2 Background

The Monroe Heights neighborhood was scheduled for improvements to be funded with the municipal bond approved by City Council Resolution No. 89-14. The City utilized Mathews and Stantec consulting firms to design the improvements. A community meeting was held during the summer of 2015 to address the possible road design sections within the available 30' right-of-way. The result of this meeting and subsequent outreach efforts were that the residents preferred one way streets with sidewalks on both sides.

In July of 2017 the City was requested to re-evaluate the design because there were concerns over elderly or unaware drivers backing up incorrectly into a one-way street. In September 2017 the City Council approved the re-design of the streets to incorporate two-way traffic, a valley gutter down the center, and sidewalk on both sides. The project design was substantially completed and was constructed by Man-Con Incorporated.

In October of 2019 the City held a workshop to discuss concerns from the residents with the valley gutter design. During this workshop the City Council directed staff to explore different roadway designs that would eliminate the valley gutter.

At the present time, the construction of the improvements is substantially complete. Since discussions on the re-design of the project had commenced, the final layer of asphalt, final pavement striping and traffic signage was cancelled to avoid re-work for these items.

3 Conceptual Design Alternatives

Design alternatives were produced that would remove the concrete valley gutter and utilize the existing 30' right-of-way, therefore not requiring property owners to give up portions of their properties. Exhibit B shows the roadways that were included for the re-design, which consist of the east-west roadways. The north-south roadways did not have a central valley gutter and therefore were not included in this design review. Exhibit C includes conceptual cross sections and plan view designs for a sample area within the project limits. A general description of the design alternatives is in the following sections.

3.1 Existing Conditions

This is the design that is currently in place, including 4' sidewalk on both sides, two (2) 10' travel lanes and valley gutter down the center.

3.2 Option 1: Two-Way Traffic with Inverted Crown

This design includes 4' sidewalk on both sides, two (2) 10' travel lanes and an asphalt gutter down the center. For this option, the concrete gutter will be removed and replaced with an asphalt gutter that will match the asphalt pavement in color and texture. The road will remain as an inverted crown, meaning that there will be a "V" shape in the middle to collect stormwater runoff. The existing drainage can stay in place.

3.3 Option 2: One-Way Traffic with Crowed Road and Curb and Gutter

This design includes 5' sidewalk on both sides, a 1' grass strip at the right-of-way line on both sides, curb and gutter and one (1) 14' travel lane. The road will be changed to a crowned section, meaning it will have the shape of an inverted "V" in the middle and stormwater will collect along the sides of the road. The existing structures along the center of the road will need to be modified with different covers. Additional drainage structures and pipe will be installed along the sides of the road to collect the stormwater runoff and connect it to the mainline system.

3.4 Option 3: Two-Way Traffic with Crowed Road and Curb and Gutter, No Sidewalk

This design includes no sidewalk, a 2' grass strip at the right-of-way line on both sides, curb and gutter and two (2) 11' travel lanes. Similar to Option 2, the road will be changed to a crowned section, the existing structures along the center of the road will need to be modified with different covers and additional drainage structures and pipe will be installed along the sides of the road to collect the stormwater runoff and connect it to the mainline system.

3.5 Option 4: Two-Way Traffic with Crowed Road and Curb and Gutter, Sidewalk on One Side

This design includes a 5' sidewalk on one side, curb and gutter and two (2) 10' travel lanes. Similar to Option 2 and 3, the road will be changed to a crowned section, the existing structures along the center of the road will need to be modified with different covers and additional drainage structures and pipe will be installed along the sides of the road to collect the stormwater runoff and connect it to the mainline system.

3.6 Option 5: Two-Way Traffic with Crowed Road, Sidewalk on Both Sides

This design includes a 5' sidewalk on both side, curb and gutter and two (2) 10' travel lanes. Similar to Option 2, 3 and 4, the road will be changed to a crowned section, the existing structures along the center

of the road will need to be modified with different covers and additional drainage structures and pipe will be installed along the sides of the road to collect the stormwater runoff and connect it to the mainline system.

4 Opinion of Probable Costs

Each design alternative was reviewed for probable project costs including engineering, permitting, construction administration, legal, administrative, and construction costs. All unit prices were based on the Man-Con Incorporated bid for the original Avenue O project. These unit prices are expected to escalate and are dependent on the time at which the City bids the work.

The construction costs were estimated based on a general assumption of the length of roadways to be improved (see Exhibit B). A summary of the cost per option is shown in Table 4.1 below. A detailed breakdown of the opinion of probable cost is presented in Exhibit D.

Table 4.1 Estimated Project Cost Summary

Design Option	Estimated Project Cost
Completion of Existing Design	$144,355.59
OPTION 1	$1,064,464.82
OPTION 2	$4,667,962.73
OPTION 3	$4,492,413.11
OPTION 4	$5,703,284.25
OPTION 5	$3,824,062.89

5 Conclusion

This technical memorandum presents alternatives for the purpose of removing the central valley gutter within the Monroe Heights Neighborhood. Each alternative, including the existing design, will provide the desired level of flood protection and adequate roadway circulation.

Exhibits

Exhibit A

Project Location Map

Legend

Project Boundary

MONROE HEIGHTS STREET CONFIGURATIONS
EXHIBIT A: PROJECT LOCATION MAP

CMA Project Number: 221.017

Exhibit B

Streets Included in Evaluation

Legend

Areas Included in Evaluation

MONROE HEIGHTS STREET CONFIGURATIONS
EXHIBIT B: STREETS INCLUDED IN EVALUATION

W 26TH COURT - W 26TH STREET - W 25TH STREET - W 24TH STREET - W 23RD STREET

CMA Project Number: 221.017

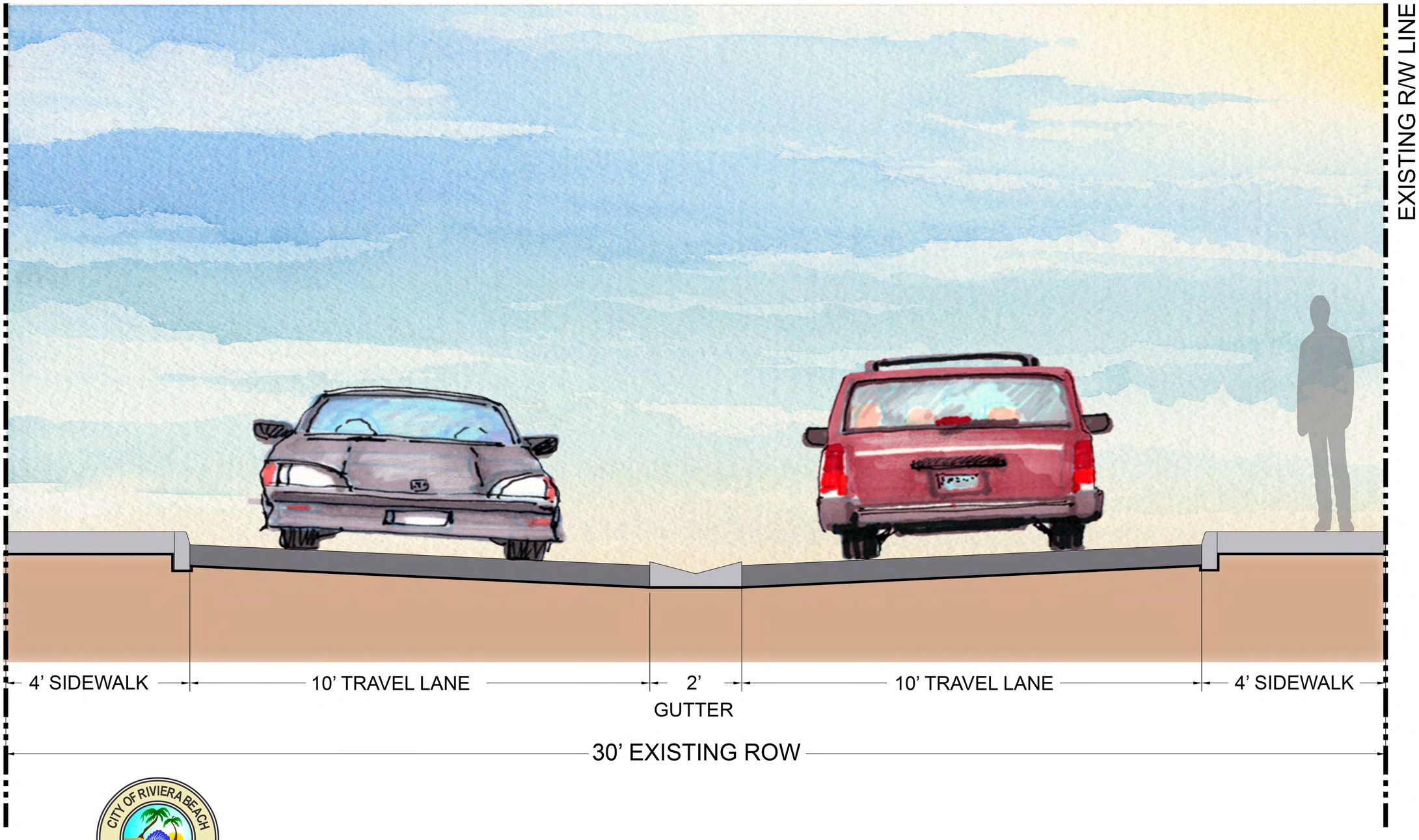
Exhibit C

Conceptual Designs

MONROE HEIGHTS STREET DESIGN

N.T.S.

EXISTING CONDITIONS - TYPICAL ROADWAY SECTION



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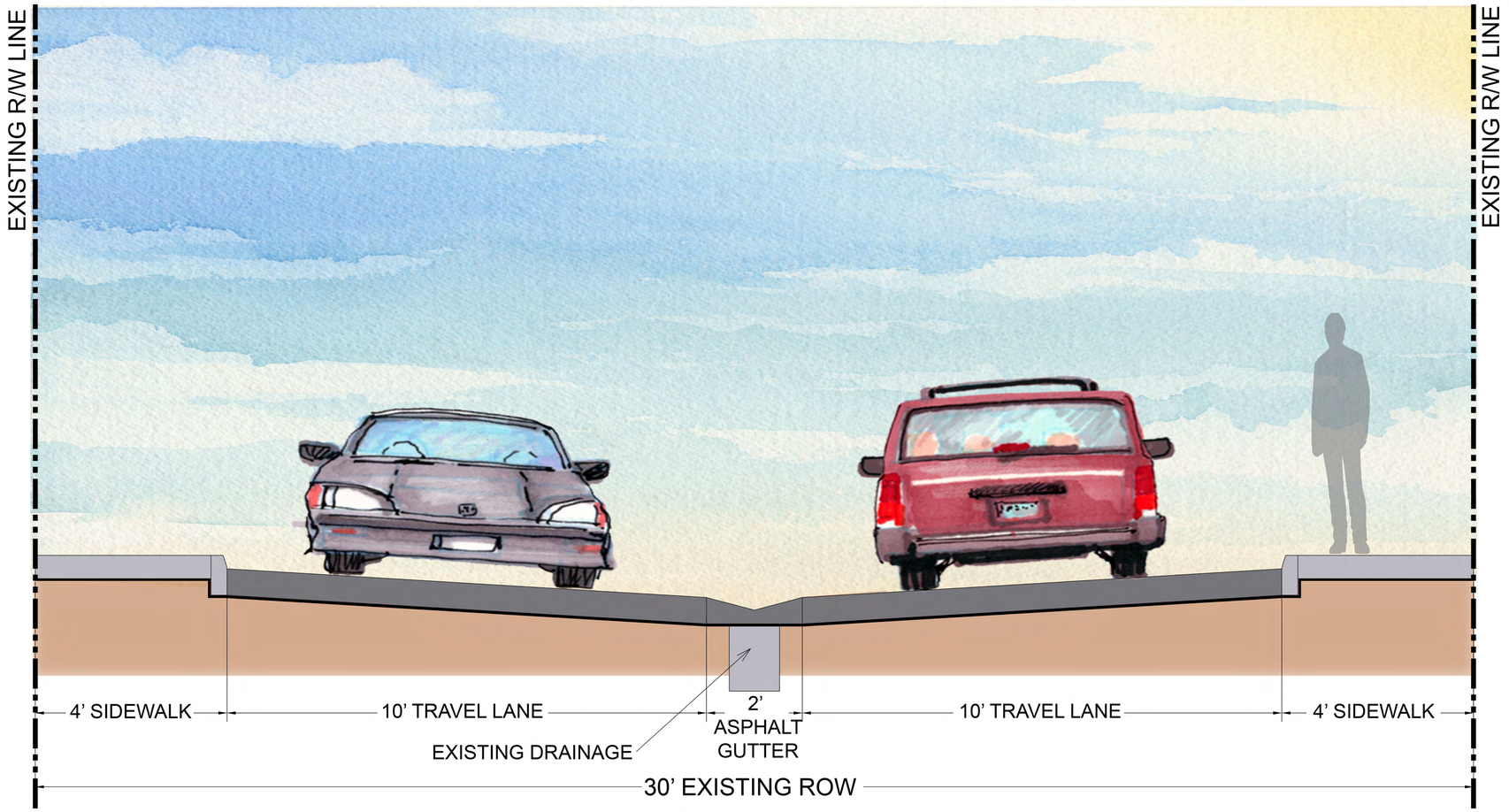
COST TO COMPLETE PROJECT AT EXISTING DESIGN: $144,355.59

MONROE HEIGHTS STREET DESIGNS

N.T.S.

OPTION 1: TWO WAY TRAFFIC WITH INVERTED CROWN ROAD

N

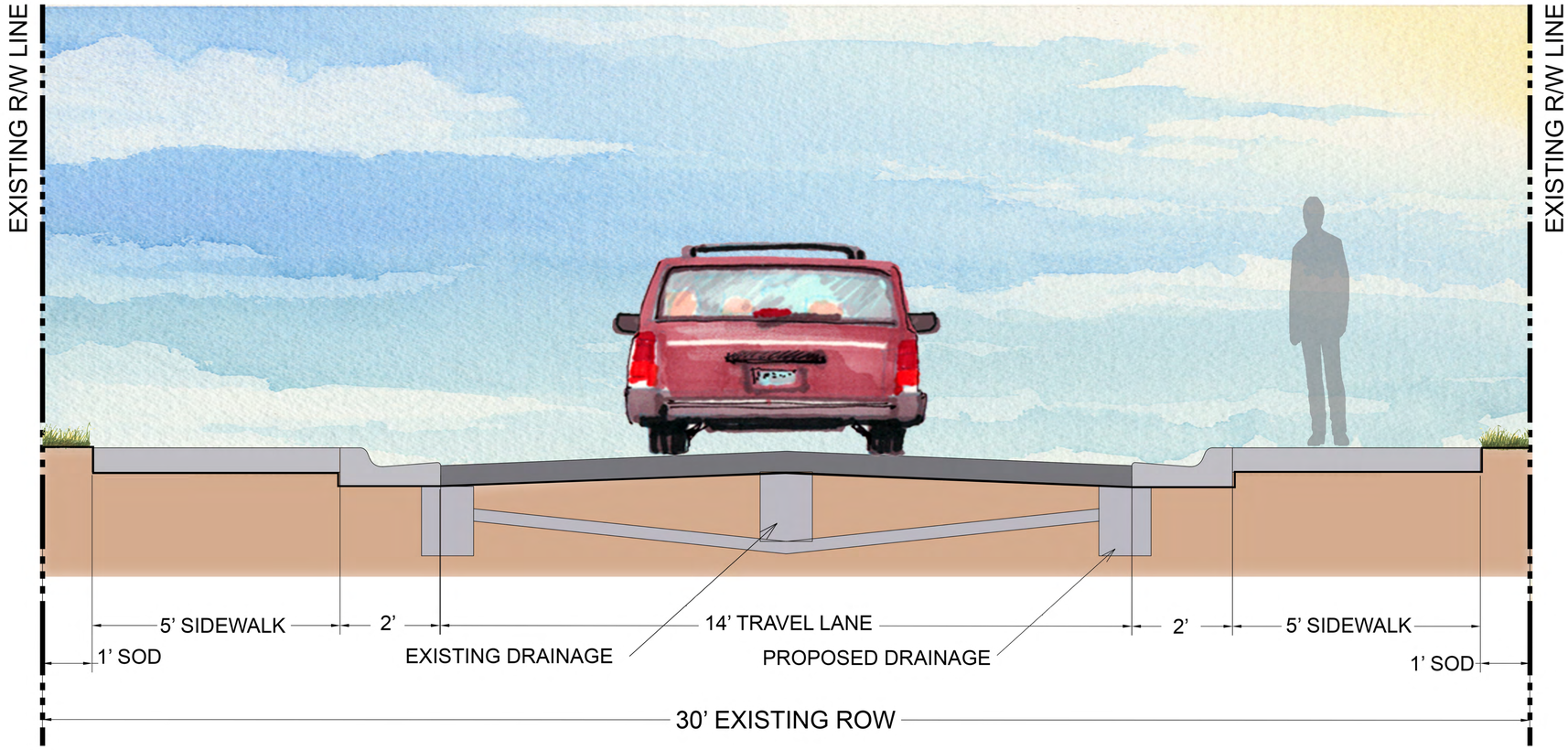


PROJECT TOTAL: $1,064,464.82

MONROE HEIGHTS STREET DESIGNS

N.T.S.

OPTION 2: ONE WAY TRAFFIC WITH CROWNED ROAD AND CURB & GUTTER



PROJECT TOTAL: $4,667,962.73

MONROE HEIGHTS STREET DESIGNS

N.T.S.

OPTION 3: TWO WAY TRAFFIC WITH CROWNED ROAD AND CURB & GUTTER - NO SIDEWALK

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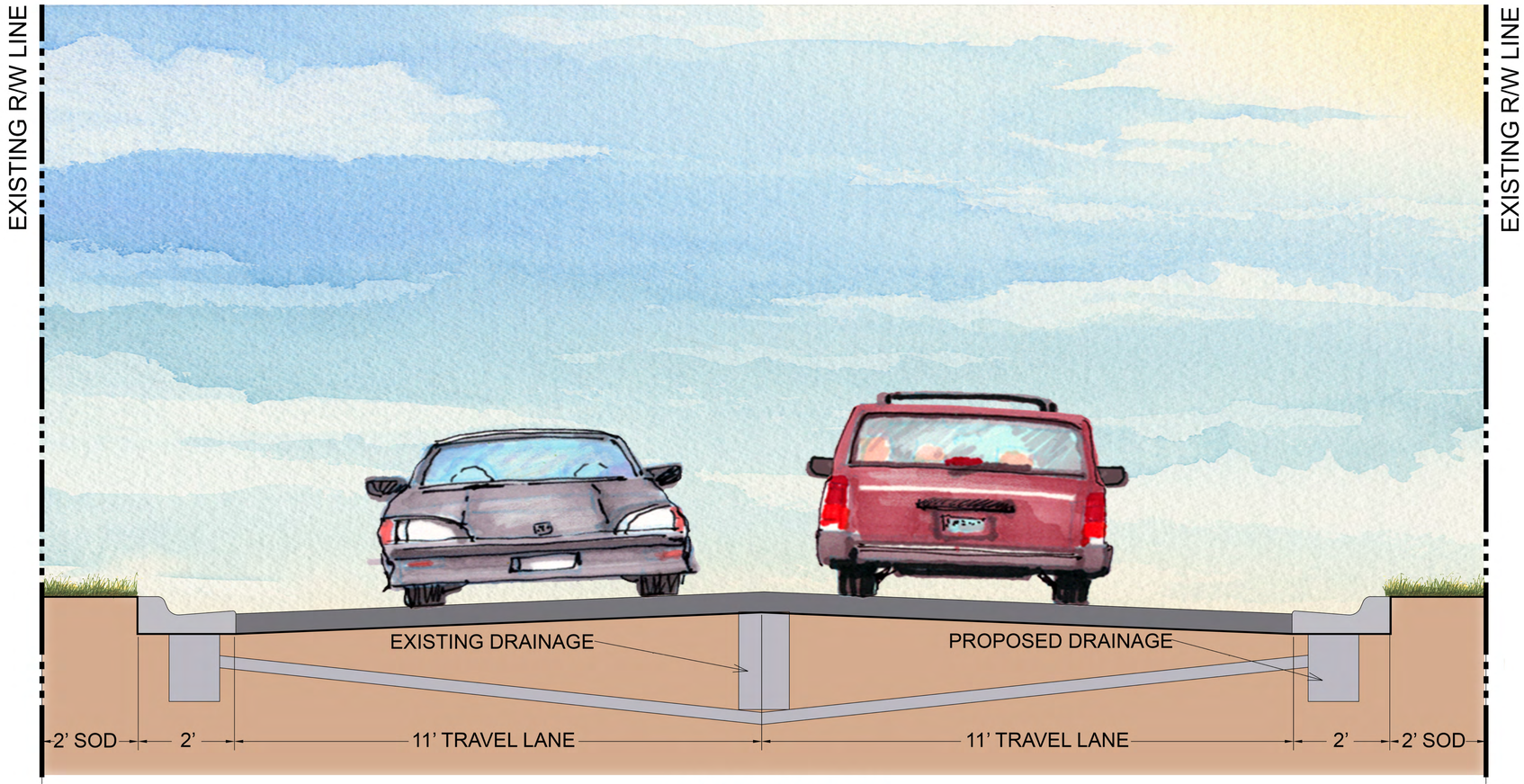
N



PROJECT TOTAL: $4,492,416.11

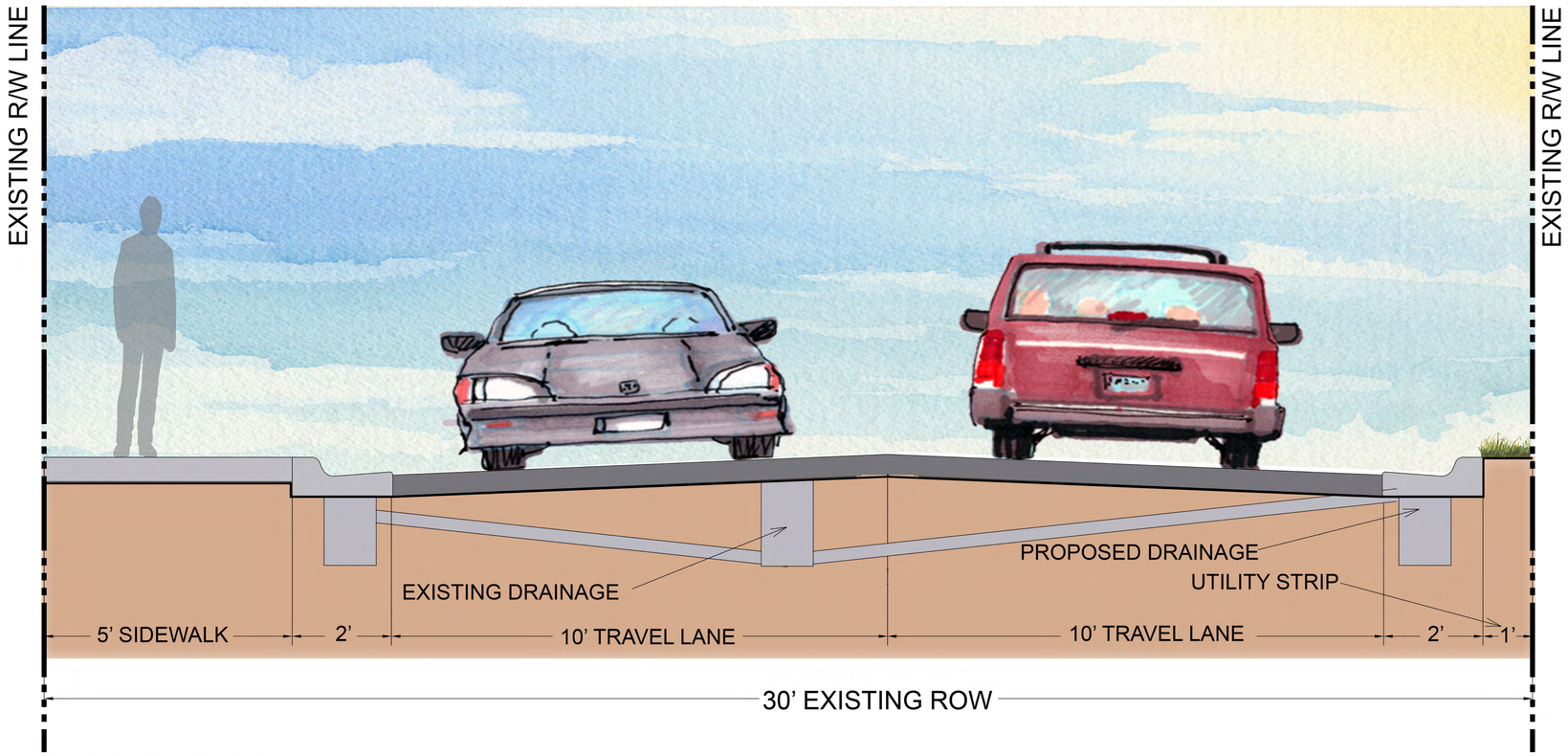
MONROE HEIGHTS STREET DESIGNS

N.T.S.

OPTION 4: TWO WAY TRAFFIC WITH CROWNED ROAD/ CURB & GUTTER/ SIDEWALK ON ONE SIDE

CITY OF RIVIERA BEACH PALM BEACH COUNTY, FL

N

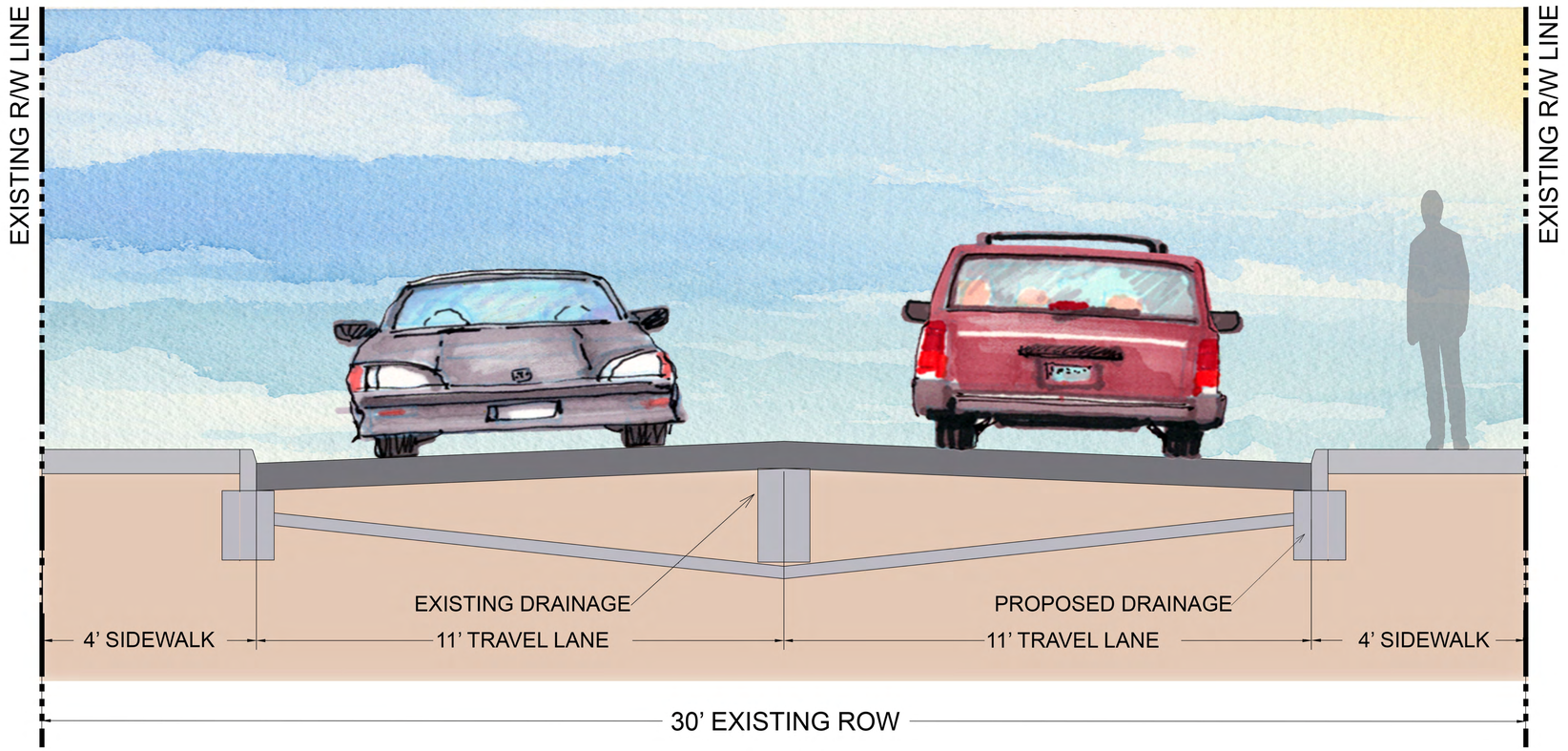


PROJECT TOTAL: $5,703,284.25

MONROE HEIGHTS STREET DESIGNS

N.T.S.

OPTION 5: TWO WAY TRAFFIC WITH CROWNED ROAD - NO CURB & GUTTER



PROJECT TOTAL: $3,824,062.89

Exhibit D

Opinion of Probable Costs

MONROE HEIGHTS STREET DESIGNS

OPINION OF PROBABLE CONSTRUCTION COST

				COMPLETION OF EXISTING DESIGN		OPTION 1		OPTION 2		OPTION 3		OPTION 4		OPTION 5	
Item No.	**Description**	**Unit**	**Unit Price**	**Quantity**	**Total**	**Quantity**	**Total**	**Quantity**	**Total**	**Quantity**	**Total**	**Quantity**	**Total**	**Quantity**	**Total**
Overhead Items															
1	Mobilization (Max 10%)	LS	-		$9,800.00	1	$56,750.00	1	$252,230.00	1	$242,680.00	1	$308,530.00	1	$206,340.00
2	Bonds and Insurance (Max 5%)	LS	-		$4,900.00	1	$28,375.00	1	$126,115.00	1	$121,340.00	1	$154,265.00	1	$103,170.00
3	Maintenance of Traffic (Max 5%)	LS	-		$4,900.00	1	$28,375.00	1	$126,115.00	1	$121,340.00	1	$154,265.00	1	$103,170.00
4	Monthly As-Built Record Drawings	LS	-			1	$4,000.00	1	$10,000.00	1	$10,000.00	1	$10,000.00	1	$10,000.00
5	Erosion and Turbidity Control. NPDES Compliance	LS	-			1	$5,000.00	1	$5,000.00	1	$5,000.00	1	$5,000.00	1	$5,000.00
6	Permit Fee (Reimbursement)	LS	-		$2,940.00	1	$17,030.00	1	$75,670.00	1	$72,810.00	1	$92,560.00	1	$61,900.00
7	Professional Audio/Video of Construction Site	LS	-		$5,000.00	1	$5,000.00	1	$5,000.00	1	$5,000.00	1	$5,000.00	1	$5,000.00
SUBTOTAL OVERHEAD ITEMS					$27,540.00		$144,530.00		$600,130.00		$578,170.00		$729,620.00		$494,580.00
ROADWAY & UTILITIES															
8	Removal of Existing Concrete Valley Gutter	LF	$10.00			9,390	$93,900.00	9,390	$93,900.00	9,390	$93,900.00	9,390	$93,900.00	9,390	$93,900.00
9	Removal of Existing Sidewalk (Including D Curb)	SY	$12.00					3,779	$45,348.00	3,779	$45,348.00	3,779	$45,348.00	160	$1,920.00
10	Limerock Base Course (4" Under Curb)	SY	$11.40					4,173	$47,576.00	4,173	$47,576.00	4,173	$47,576.00		
11	Driveway Rebuild (6" Concrete) (Outside R/W)	SY	$67.90					2,440	$165,676.00	1,490	$101,171.00	9,440	$640,976.00	630	$42,777.00
12	1" Type S-III Surface Course	SY	$7.40	7,640	$56,536.00	7,640	$56,536.00	7,640	$56,536.00	7,640	$56,536.00	7,640	$56,536.00	7,640	$56,536.00
13	Mill & Overbuild w/ Type S-III (Assume 2" average)	SY	$55.00					14,610	$803,550.00	22,960	$1,262,800.00	20,870	$1,147,850.00	21,910	$1,205,050.00
14	Asphalt Gutter	LF	$40.00			9,390	$375,600.00								
15	Type C - 37x24 Curb Inlet W/ Grate	EA	$3,812.00					34	$129,608.00	34	$129,608.00	34	$129,608.00	34	$129,608.00
16	Core and Connect to Existing Drainage Structure (2 Sides)	EA	$1,500.00					17	$25,500.00	17	$25,500.00	17	$25,500.00	17	$25,500.00
17	Modify Existing Inlet to MH	EA	$1,000.00					17	$17,000.00	17	$17,000.00	17	$17,000.00	17	$17,000.00
18	Concrete Pipe Culvert (15" Solid) (Include Trenching & Backfilling)	LF	$81.00					204	$16,524.00	204	$16,524.00	204	$16,524.00	204	$16,524.00
19	Concrete Curb and Gutter (Type F)	LF	$27.50					18,780	$516,450.00	18,780	$516,450.00	18,780	$516,450.00		
20	Concrete Curb and Gutter (Type D)	LF	$20.00											18,780	$375,600.00
21	4" Thick Concrete Sidewalk (Includes Thickened Edge For 4' Sidewalk)	SY	$46.60					10,440	$486,504.00			5,220	$243,252.00	160	$7,456.00
22	Detectable Warning Surface (28 Locations)	SF	$31.60					480	$15,168.00			240	$7,584.00		
23	Sod (Match Existing) (Include Watering and Maintenance)	SY	$8.75					1,310	$11,462.50	2,620	$22,925.00	655	$5,731.25		
24	Pavement Marking and Signage	LS	-	1	$35,450.60	1	$35,450.60	1	$35,450.60	1	$35,450.60	1	$35,450.60	1	$35,450.60
25	Speed Hump	EA	$3,000.00	2	$6,000.00	2	$6,000.00	2	$6,000.00	2	$6,000.00	2	$6,000.00	2	$6,000.00
26	Adjust Existing Utility Fixtures (Incl Valve Boxes, Fire Hydrants, SS MH)	EA	$500.00					100	$50,000.00	100	$50,000.00	100	$50,000.00	100	$50,000.00
SUBTOTAL ROADWAY & UTILITIES					$97,986.60		$567,486.60		$2,522,253.10		$2,426,788.60		$3,085,285.85		$2,063,321.60
SUB-TOTAL CONSTRUCTION COST					**$125,526.60**		**$712,016.60**		**$3,122,383.10**		**$3,004,958.60**		**$3,814,905.85**		**$2,557,901.60**
CONSTRUCTION CONTINGENCY (15%)					$18,828.99		$106,802.49		$468,357.47		$450,743.79		$572,235.88		$383,685.24
TOTAL CONSTRUCTION COST					**$144,355.59**		**$818,819.09**		**$3,590,740.57**		**$3,455,702.39**		**$4,387,141.73**		**$2,941,586.84**
LEGAL AND ADMIINISTRATIVE FEES (10%)					N/A		$81,881.91		$359,074.06		$345,570.24		$438,714.17		$294,158.68
DESIGN, PERMITTING AND CONSTRUCTION ADMINISTRATION (20%)					N/A		$163,763.82		$718,148.11		$691,140.48		$877,428.35		$588,317.37
PROJECT TOTAL					**$144,355.59**		**$1,064,464.82**		**$4,667,962.73**		**$4,492,413.11**		**$5,703,284.25**		**$3,824,062.89**