

Technical Memorandum

To: Robert Companion, PE
From: Dow Peters, PE (Peters and Yaffee)
Date: July 2, 2021
Re: 14th Street Improvements Project – Guardrail, Drainage and Mid-Block Improvement Options

Introduction

On the east side of 14th Street at Mystic Lane is a section of existing guardrail that is currently shielding a 24" cross drain (RCP). This cross drain does present a drop-off hazard that is within the roadway clear zone. In addition, there is existing ditch pavement at this location that is providing erosion control and the existing roadside ditches from the north and south are draining to this cross drain. East of this drainage area, is an existing sidewalk with handrail that provides back of sidewalk drainage that flows from an existing residential development from the east to west and ultimately to the 24" cross drain.

The initial recommendation was to shield this drop-off with guardrail during the recent roadway improvement project for 14th Street. This guardrail solution has created a barrier and two options are being presented in order to resolve the issue.

Attached with this Technical Memorandum are cost estimates for both options along with a Mid-Block Crossing on 14th Street within the vicinity of Mystic Lane.

Option #1-Guardrail Modifications

Option #1 includes providing a break in the existing guardrail along the north bound travel lane on 14th Street across from Mystic Lane. The cost estimate includes guardrail, end treatments, required miscellaneous asphalt and shoulder treatment. Additional services include subsurface utility exploration to identify all existing utilities.

The guardrail installation will include General, TL-3 Guardrail for design speeds greater than 45 mph and will provide a minimum length of 75'.

The total cost for guardrail installation is **\$12,368**.

Option #2-Drainage Modifications

Option #2 includes providing drainage improvements that would eliminate the clear zone issue all together at the guardrail location. These drainage improvements include extending the existing 24" RCP to a proposed ditch bottom inlet to provide a closed system at this location while eliminating the drop-off condition. Additional improvements would include: relocation of the existing sidewalk, regrading the existing roadside ditches, additional embankment material and removal of the existing ditch pavement at the existing headwall. Additional services include subsurface utility exploration to identify all existing utilities and potential permitting involvement.

The total cost for the drainage modifications is **\$23,700**.

Mid-Block Crossing Improvements

The Mid-Block Crossing Improvements include a Rectangular Rapid Flashing Beacon Pedestrian Crosswalk System that will be MUTCD compliant. This crossing system will provide heightened driver awareness at this location. This improvement will also include a lighting option for pedestrian visibility at night.

The total cost for the Mid-Block Crossing is **\$37,707**.

Field Review Observations and Notes

A field review along 14th Street at Mystic Drive was conducted for the conditions of the existing guardrail and the location of the existing drainage features that are within the roadway clear zone. The following observations and notes were made:



Photo 1
14th Street at Mystic Lane

On the west side of the 14th Street at Mystic Lane looking east. There is existing guardrail adjacent to the northbound travel lane shielding the roadside hazard on 14th Street.



Photo 2
14th Street at Mystic Lane

On the west side of the 14th Street at Mystic Lane looking southbound. The existing guardrail is present on both side of the roadway shielding the roadside hazards.



Photo 3
14th Street at Mystic Lane

On the east side of 14th Street looking north across from Mystic Lane at the existing guardrail end treatment.



Photo 4
14th Street at Mystic Lane

On the east side of 14th Street across from Mystic Lane looking south at the existing headwall and ditch pavement. This existing drop-off hazard is in the clear zone and is currently being shielded by the guardrail on the northbound lane on 14th Street.



Photo 5
14th Street at Mystic Lane

On the east side of 14th Street across from Mystic Lane looking west at the existing headwall. This existing drop-off hazard is in the clear zone and is currently being shielded by the guardrail on the northbound lane on 14th Street.



Photo 6
14th Street at Mystic Lane

On the east side of 14th Street across from Mystic Lane looking north at the existing sidewalk. There is a back of sidewalk drainage feature at this sidewalk location. Offsite flow is moving from east to the west at this location.

14th Street at Mystic Lane, Nassau County, Florida

ENGINEER'S ESTIMATE OF PROBABLE COST

Option #1: Guardrail Modifications

14th Street at Mystic Lane

East side of 14th St, across from Mystic Lane

Item Number	Description	Raw Qty	Unit	Unit Price	Subtotal
536-1-1	GUARDRAIL -ROADWAY, GENERAL TL-3	75	LF	\$ 37.38	\$ 2,803.50
536-73	GUARDRAIL REMOVAL	50	LF	\$ 50.00	\$ 2,500.00
536-85-24	GUARDRAIL END TREATMENT- PARALLEL APPROACH TERMINAL	3	EA	\$ 2,259.08	\$ 6,777.24
570-1-2	PERFORMANCE TURF, SOD	50	SY	\$ 5.75	\$ 287.50
				Sub-total:	\$ 12,368

Option #2: Drainage Modifications

14th Street at Mystic Lane

East side of 14th St, north of Mystic Lane

Item Number	Description	Raw Qty	Unit	Unit Price	Subtotal
110-1-1	CLEARING & GRUBBING	0.25	AC	\$ 25,000.00	\$ 6,250.00
110-4-10	REMOVAL OF EXISTING CONCRETE	30	SY	\$ 62.38	\$ 1,871.40
120-6	EMBANKMENT	12	CY	\$ 37.74	\$ 452.88
430-175-124	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 24"CD	8	LF	\$ 165.00	\$ 1,320.00
570-1-2	PERFORMANCE TURF, SOD	70	SY	\$ 5.75	\$ 402.50
425-1-541	INLETS, DT BOT, TYPE D, <10'	1	EA	\$ 6,500.00	\$ 6,500.00
425-1-531	INLETS, DITCH BOTTOM, TYPE C MODIFIED- BACK OF SIDEWALK, <10'	1	EA	\$ 5,928.00	\$ 5,928.00
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK	15	SY	\$ 65.00	\$ 975.00
				Sub-total:	\$ 23,700

Mid-block Crossing Improvements

430-175-118	PIPE CULVERT,OPTIONAL MATERIAL,ROUND, 18"S/CD	8	LF	\$ 185.00	\$ 1,480.00
430-982-125	MITERED END SECTION, OPTIONAL ROUND, 18" CD	2	EA	\$ 1,690.00	\$ 3,380.00
0522 1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	17	SY	\$ 65.00	\$ 1,105.00
570-1-2	PERFORMANCE TURF, SOD	10	SY	\$ 5.75	\$ 57.50
0630 2 11	CONDUIT, F& I, OPEN TRENCH	85	LF	\$ 10.00	\$ 850.00
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	75	LF	\$ 19.75	\$ 1,481.25
0635 2 11	PULL & SPLICE BOX, F&I, 13" x 24"	3	EA	\$ 795.00	\$ 2,385.00
0639 1123	ELECTRICAL POWER SRV,F&I, UG,PUR,NOT REQ	1	EA	\$ 2,030.00	\$ 2,030.00
0639 2 1	ELECTRICAL SERVICE WIRE, F&I	126	LF	\$ 7.00	\$ 882.00
0641 2 12	PREST CNC POLE,F&I,TYP P-II SRV POLE	1	EA	\$ 1,315.00	\$ 1,315.00
0654 2 11	RECT RAPID FLASH BCN, F&I AC, 1 SIGN	2	EA	\$ 6,825.00	\$ 13,650.00
0700 1 11	SINGLE POST SIGN, F&I GM, <12 SF	4	EA	\$ 390.00	\$ 1,560.00
0711 11123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	120	LF	\$ 3.25	\$ 390.00
0711 11125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	70	LF	\$ 5.25	\$ 367.50
0711 14160	THERMOPLASTIC, PREFORMED, WHITE, MESSAGE	2	EA	\$ 229.00	\$ 458.00
0715 4 11	LIGHT POLE COMPLETE, F&I- STD, 30'	1	EA	\$ 5,040.00	\$ 5,040.00
0715 11211	LUMINAIRE ,F&I-REP EXIST, RDWY, COBRA H	1	EA	\$ 1,276.00	\$ 1,276.00
				Sub-total:	\$ 37,707