



**Gatewood Drive Outfall Ditch
Damage Survey Report**

**September 16, 2020
Hurricane Sally**



December 2020

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I. DAMAGE SURVEY

Sigma Consulting Group (SIGMA) has been placed under contract with Escambia County Engineering Department to provide a damage survey report for the Gatewood Drive Outfall Ditch to determine the extent and probable cause for the damage caused by Hurricane Sally that occurred on September 16, 2020. Unofficial rainfall total estimates for the hurricane vary from 25 to 30 inches throughout the Pensacola area. The rainfall events were unprecedented and exceeded the design rainfall events required by state, local, and federal regulatory agencies for stormwater facilities. The damage to the infrastructure listed above consists of erosion, sedimentation, and scour that occurred during Hurricane Sally. Photographs detailing the damaged areas can be found in Appendix A: Photographic Essay.

II. REVIEW

Review of the project site revealed that damages including, but not necessarily limited to, scour, erosion, sedimentation, and ditch collapse. Additionally, debris accumulation occurred throughout the outfall ditch. The review began on the east end of the concrete outfall ditch adjacent to the Essex Apartments and proceeded west to Lyric Lane, then west to Tonbridge Drive, and ended at Gatewood Drive. The review consisted of classifying the damaged areas as either “Drainage Repair” or “Drainage Improvement/Upgrades.” The drainage repair designation indicates damaged locations that are not likely to reoccur. The drainage improvement/upgrade designation indicates damaged areas that are anticipated to reoccur in the future, and pose a possible threat to the health, welfare, and safety of the adjoining residential properties. An overall map depicting the drainage repair locations is included in Appendix B. A detailed list of the Drainage Repair and Drainage Improvement/Upgrades areas that were reviewed list as follows:

ESSEX APARTMENTS [Drainage Repair (DR) #1 thru #4]

- **DR#1** – Remove/Replace Asphalt, Base, Subgrade, Fill, Grade, Sod, and Fence
- **DR#2** – Remove/Replace Concrete Ditch, Sediment Removal, Grade, and Sod
- **DR#3** – Remove/Replace Concrete Ditch, Sediment Removal, Grade, and Sod
- **DR#4** – Remove/Replace Asphalt, Base, Subgrade, Concrete Ditch, Sediment Removal, Grade, Fill, and Sod

ESSEX APARTMENT TO TONBRIDGE DRIVE [Drainage Area (DA) #5]

The drainage repairs noted in these areas list as follows:

- Clear and Grub
- Tree Removal
- Debris Removal
- Picket Fence Removal and Replacement
- Concrete Ditch Removal and Replacement
- Fill
- Grading
- Sodding

TONBRIDGE DRIVE to GATEWOOD DRIVE [Drainage Area (DA) #6]

- Clear and Grub
- Tree Removal
- Debris Removal
- Picket Fence Removal and Replacement
- Chainlink Fence Removal and Replacement
- Concrete Ditch Removal and Replacement
- Asphalt Ditch Removal and Replacement
- Fill
- Grading
- Sodding

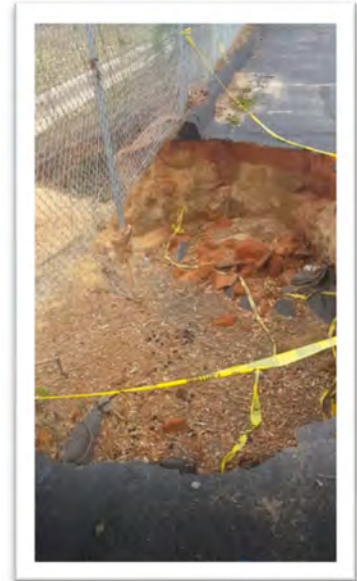
III. RECOMMENDATIONS

SIGMA recommends that drainage repairs occur to the areas denoted adjacent to Essex Apartments, Essex Apartments to Tonbridge Drive, and Tonbridge Drive to Gatewood Drive. A total of six (6) drainage repair point/areas were delineated from our field investigations. A brief description of our drainage repair recommendations for each of the locations list as follows:

ESSEX APARTMENTS

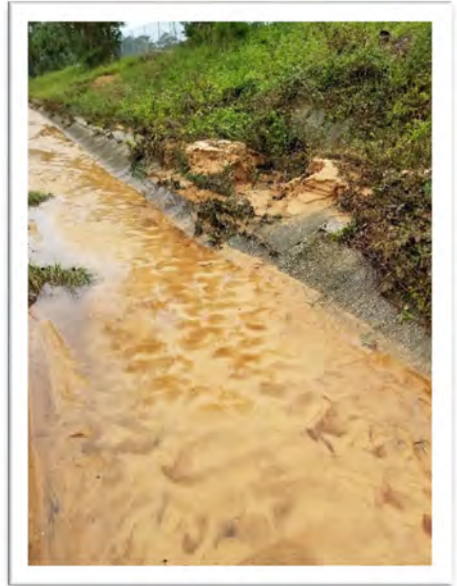
Drainage Repair #1

The concrete outfall ditch overtopped during the storm event. The atypical rain event could not be accommodated by the existing concrete ditch at this location. The rain event resulted in a substantial amount of debris and sedimentation being deposited downstream of the location. The overtopping also caused a scourhole to develop in the adjoining parking lot for the Essex Apartments and the sodded sideslope for the concrete ditch. The concrete ditch slope will need to be repaired to re-establish the design flow capacity and reduce the potential for future scour events. The parking area will need to be repaired to re-establish safe driving conditions for the residents in the apartment complex. To repair the system, it will be necessary to remove sediment and debris from the ditch system, fill/grade & sod the existing ditch slopes, and fill/grade/repave the existing parking lot.



Drainage Repair #2

The concrete outfall ditch overtopped during the storm event. The atypical rain event could not be accommodated by the existing concrete ditch at this location. The rain event resulted in a substantial amount of debris and sedimentation being deposited downstream of the location. The overtopping also caused scouring to develop along the top edges of the concrete ditch which resulted in the concrete ditch uplifting in this area. The concrete ditch section will need to be removed and replace to re-establish the design flow capacity and reduce the potential for future scour events. To repair the system, it will be necessary to remove sediment and debris from the ditch system, remove and replace the concrete ditch, and fill/grade/sod the perimeter of the new ditch section.



Drainage Repair #3

The concrete outfall ditch overtopped during the storm event. The atypical rain event could not be accommodated by the existing concrete ditch at this location. The rain event resulted in a substantial amount of debris and sedimentation being deposited downstream of the location. The

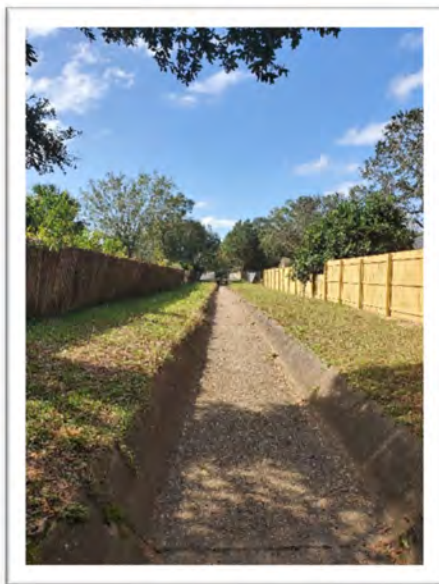
overtopping also caused scouring to develop along the top edges of the concrete ditch which resulted in the concrete ditch uplifting in this area. The concrete ditch section will need to be removed and replace to re-establish the design flow capacity and reduce the potential for future scour events. To repair the system, it will be necessary to remove sediment and debris from the ditch system, remove and replace the concrete ditch and fill/grade/sod the perimeter of the new ditch section.

Drainage Repair #4

The concrete outfall ditch overtopped during the storm event. The atypical rain event could not be accommodated by the existing concrete ditch at this location. The rain event resulted in a substantial amount of debris and sediment accumulating at this location. An existing support column for an aerial sewer crossing created a vertical obstruction that caused debris to accumulate at this location resulting in ditch overtopping. The overtopping also caused scouring to develop along the top edges of the concrete ditch which resulted in the concrete ditch uplifting in this area. The overtopping also caused a scourhole to develop in the adjoining parking lot for the Essex Apartments and the sodded sideslopes for the concrete ditch. The damaged concrete ditch section will need to be removed and replaced to re-establish the design flow capacity and reduce the potential for future scour events. The parking area will need to be repaired to re-establish safe driving conditions for the residents in the apartment complex. To repair the system, it will be necessary to remove sediment and debris from the ditch system, remove and replace the concrete ditch, fill/grade/sod the perimeter of the new ditch section and fill/grade/repave the existing parking lot.



Drainage Area #5 - ESSEX APARTMENT TO TONBRIDGE DRIVE



The concrete outfall ditch overtopped during the storm event. The atypical rain event could not be accommodated by the existing concrete ditch through this area. The ditch overtopping caused scour, sedimentation, ditch upheaval/lift, tree overtopping, fence damage, debris accumulation and flooding to the adjacent houses. The damaged concrete ditch sections will need to be removed and replaced to re-establish the design flow capacity and reduce the potential for future scour events. To repair the system, it will be necessary to remove sediment and debris, remove trees causing ditch upheaval, remove and replace damaged sections of concrete ditch, fill/grade/sod the perimeter of the new ditch section, and remove/replace damaged fencing.

Drainage Area #6 - TONBRIDGE DRIVE TO GATEWOOD DRIVE (Drainage Area #6)

The concrete outfall ditch overtopped during the storm event. The atypical rain event could not be accommodated by the existing concrete ditch through this area. The ditch overtopping caused scour, sedimentation, ditch upheaval/lift, tree overtopping, fence damage, debris accumulation and flooding to the adjacent houses. The damaged concrete ditch sections will need to be removed and replaced to re-establish the design flow capacity and reduce the potential for future scour events.



To repair the system, it will be necessary to remove sediment and debris, remove trees causing ditch upheaval, remove and replace damaged sections of concrete ditch, remove, and replace damaged sections of asphalt ditch, fill/grade/sod the perimeter of the new ditch section, and remove/replace damaged fencing.

SIGMA recommends that drainage improvements/upgrades occur to prevent the repetitive damage/losses that occur throughout this project area. A total of 3 drainage upgrades/improvements were determined from our field investigations. A brief description of each of these recommendations list as follows:

DRAINAGE IMPROVEMENTS/UPGRADES

1. Concrete Ditch Widening

Increase the existing concrete ditch width to 20' from Station 90+90 to 125+00 for 3,410 LF

2. Lyric Lane Bridge Removal

Remove the Lyric Lane private bridge and a new 24' wide x 330' long County maintained roadway that connect directly to Johnson Avenue.

3. Tonbridge Drive Bridge Removal and Replacement

Remove and replace the existing bridge system with a new bridge that provides additional flow capacity and debris clearance.

IV. OPINION OF PROBABLE CONSTRUCTION COSTS

The opinion of probable cost to construct the recommendations from section III list as follows:

A. Drainage Repairs 1 thru 4 and Drainage Areas 5 & 6

The total probable construction cost estimate for Drainage Repairs and Areas is *\$217,000.00*. The probable cost of engineering and permitting these repairs is *\$30,000.00*. A more detailed breakdown of each of these repairs is listed in Appendix C.

B. Drainage Improvements/Upgrades

The total probable construction cost estimate for all of the drainage improvements/upgrades is *\$827,000.00*. The probable cost of engineering and permitting these mitigations is *\$100,000.00*. A more detailed breakdown of each of these mitigation options is listed in Appendix C.

APPENDIX A:
PHOTOGRAPHIC ESSAY



Tonbridge Drive Bridge – Facing West: DA#6



Ditch Upheaval and TOD Scour – 100' West of Tonbridge Drive – Facing West: DA#6

Gatewood Outfall

Hurricane Sally – Preliminary Engineering Assessment

Photographic Essay

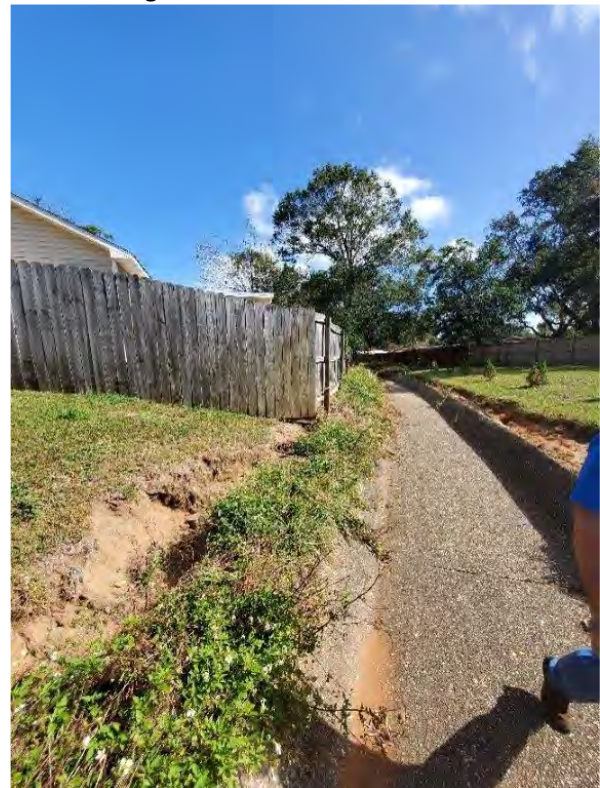
November 2020



TOD Scour and Ditch Upheaval – 500' West of Tonbridge Drive – Facing West: DA#6



TOD Scour and Ditch Upheaval – 600' West of Tonbridge Drive – Facing West: DA#6



TOD Scour and Ditch Upheaval – 650' West of Tonbridge Drive – Facing East: DA#6

Prepared by Sigma Consulting Group, Inc.

Gatewood Outfall

Hurricane Sally – Preliminary Engineering Assessment Photographic Essay November 2020



TOD Scour and Ditch Upheaval – 700' West of Tonbridge Drive – Facing West: DA#6



TOD Scour and Ditch Upheaval – 750' West of Tonbridge Drive – Facing West: DA#6



20' to 8' ditch transition – TOD Scour – 800' West of Tonbridge Drive – Facing West: DA#6



20' to 8' ditch transition – TOD Scour & Ditch Upheaval – 800' West of Tonbridge Drive Facing West: DA#6

Gatewood Outfall

Hurricane Sally – Preliminary Engineering Assessment

Photographic Essay

November 2020



20' to 8' ditch width reduction – TOD Scour & Ditch Upheaval – 800' West of Tonbridge Drive Facing East: DA#6



Asphalt Ditch Upheaval/ Failure – 900' West of Tonbridge Drive – Facing West: DA#6



Asphalt Ditch Upheaval/ Failure – 900' West of Tonbridge Drive – Facing West: DA #6



Discharge from Ridgefield – Facing West, SW corner of Essex Apartments: DA#5



Debris Clogging outfall flume under fence – East Side – Facing North: DA#5



Trees down, blocking ditch – 150 east of Lyric Lane Bridge – Facing West: DA#5



Trees down, blocking ditch – 150 east of Lyric Lane Bridge – Facing East: DA#5



Concrete ditch uplift 100' east of Lyric Lane Bridge – Facing West: DA#5

Gatewood Outfall

Hurricane Sally – Preliminary Engineering Assessment Photographic Essay November 2020



Concrete ditch scour – 100' east of Lyric Lane Bridge – Facing East: DA#5



Fence Damage and Debris – 100' east of Lyric Lane Bridge – Facing East: DA#5



Lyric Lane Bridge – Facing West: DA#5



Debris at Lyric Lane Bridge Crossing – Facing SE – Upstream: DA#5



Debris at Lyric Bridge Crossing – Facing SE – Upstream: DA#5



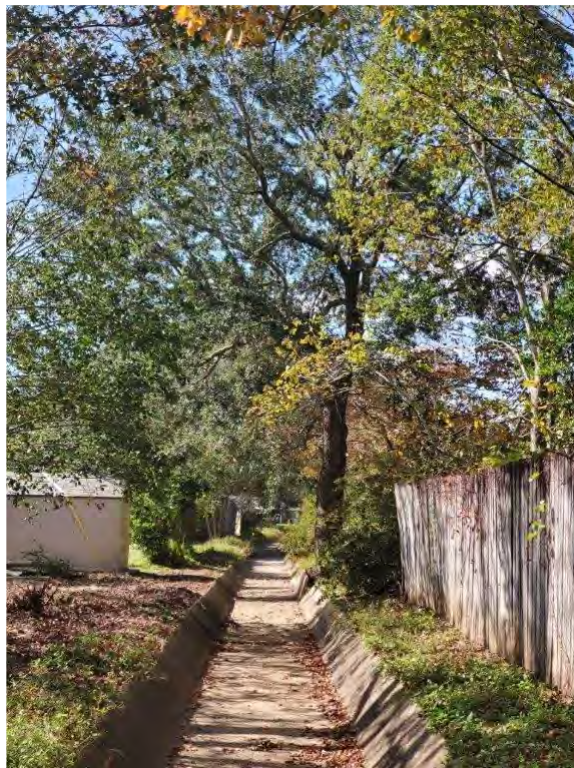
Debris at Lyric Lane Bridge Crossing – Facing East – Upstream: DA#5



Tonbridge Drive Bridge – Facing West: DA#5



8' Wide concrete ditch – Facing West – Tonbridge Drive: DA#5



Ditch Upheaval and TOD Scour – 100' West of Tonbridge Drive – Facing West: DA#5



Essex Apartments – Scour hole, Concrete Upheaval: DR#4



Essex Apartments – Concrete Outfall Ditch - Scour hole, Concrete Upheaval: DR#4



Essex Apartments – Concrete Outfall Ditch: Sedimentation, Concrete Upheaval: DR#3



Essex Apartments – Concrete Outfall Ditch: Sedimentation, Concrete Upheaval: DR#2



Essex Apartments – Scour, Erosion, and Sedimentation – Expanding – DR#1



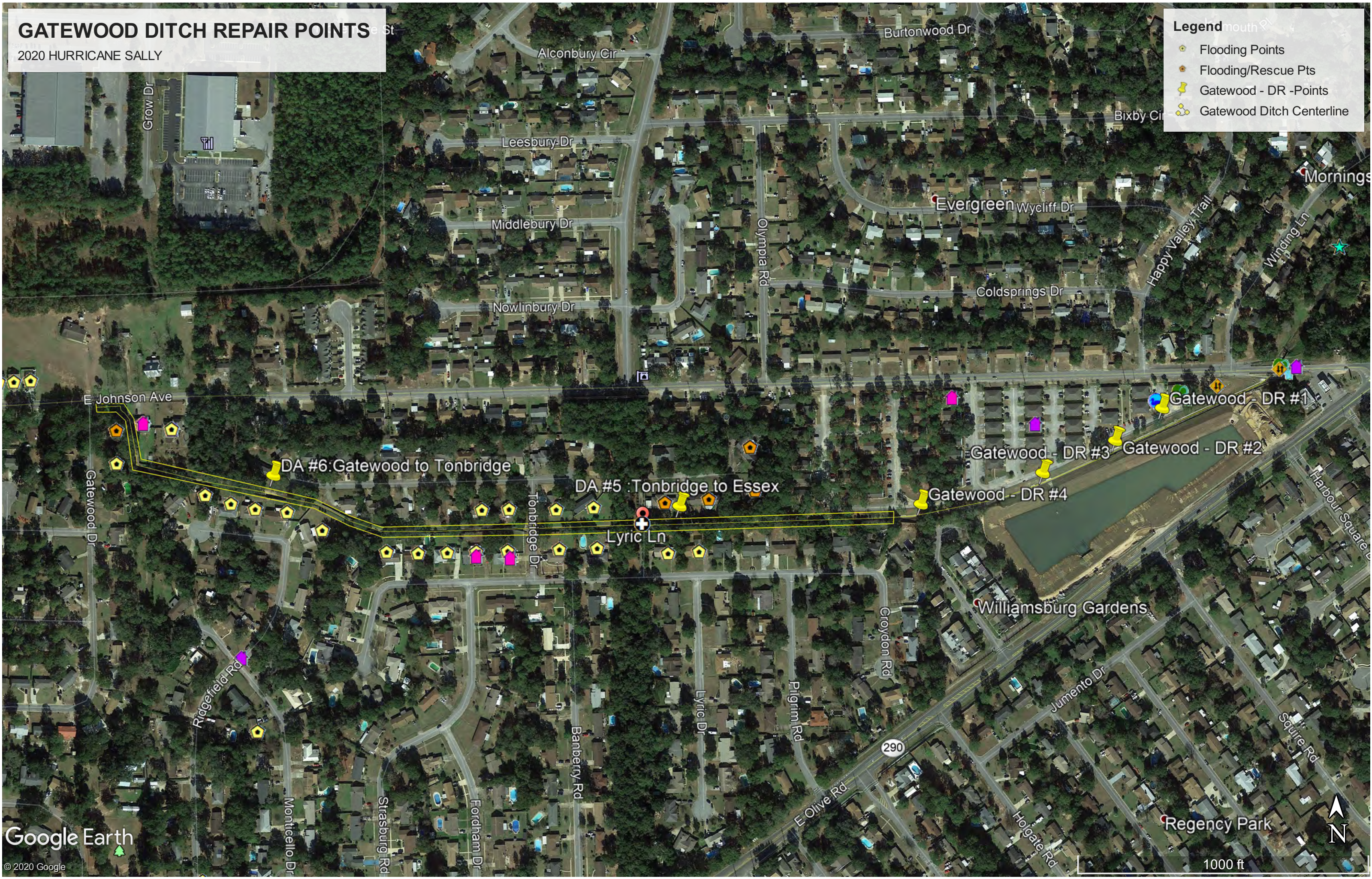
Essex Apartments – Scour, Erosion, and Sedimentation –
Expanding – DR#1

APPENDIX B:
OVERALL MAP

GATEWOOD DITCH REPAIR POINTS

2020 HURRICANE SALLY

- Legend**
- Flooding Points
 - Flooding/Rescue Pts
 - Gatewood - DR -Points
 - Gatewood Ditch Centerline



APPENDIX C:
OPINION OF PROBABLE
CONSTRUCTION COSTS

Gatewood DSR Preliminary Cost Estimate Drainage Improvements 1 thru 3																											
		PD16-17.081 General Paving and Drainage Pricing Agreement			Chavers Construction, Inc.		Panhandle Grading & Paving, Inc.		Roads, Inc. of NWF		12%	Totals Rounded	Drainage Improvements #1 : Concrete Ditch Widening					Drainage Improvements #2 : Lyric Lane Bridge Removal					Drainage Improvements #3 Tonbridge Removal & Replacement				
		Valid From December 1, 2018 to November 30, 2019											Length	Width	Depth	Area	Volume	Length	Width	Depth	Area	Volume	Length	Width	Depth	Area	Volume
Section	Category	Sub-Category	Quantity	Units	Unit Price	Ext Cost	Unit Price	Ext Cost	Unit Price	Ext Cost			(feet)	(feet)	(feet)	(SY)	(CY)	(feet)	(feet)	(feet)	(SY)	(CY)	(feet)	(feet)	(feet)	(SY)	(CY)
02100-	00104	Mobilization, 46 + Miles	8	EA	\$3,500.00	\$28,000.00	\$3,400.00	\$27,200.00	\$3,500.00	\$28,000.00	4	4															
03100-	00102	Clearing and Grubbing (Including Trees UNDER 12" dia.), per County Specifications 2230	15364	SY	\$2.45	\$37,641.80	\$2.00	\$30,728.00	\$2.00	\$30,728.00	15363.91111	13717.7778	3410	26		9851.111		330	60		2200		250	60		1666.66667	
04100-	00106	Earthwork Establishing Grade, County Specs 2300	15364	SY	\$1.90	\$29,191.60	\$1.50	\$23,046.00	\$1.45	\$22,277.80	15363.91111	13717.7778	3410	26		9851.111		330	60		2200		250	60		1666.66667	
05200-	00107	2" County Spec 2500 Type SP 12.5 Asphalt, less than 1500sy	1733	SY	\$10.00	\$17,330.00	\$8.15	\$14,123.95	\$8.05	\$13,950.65	1732.266667	1546.66667						330	24		880		250	24		666.666667	
05600-	00105	Remove Existing Asphalt, 2" Average Depth	1494	SY	\$3.23	\$4,825.62	\$2.00	\$2,988.00	\$2.00	\$2,988.00	1493.333333	1333.33333						300	20		666.6667		250	24		666.666667	
05600-	00108	Saw cut Existing Asphalt	135	LF	\$2.00	\$270.00	\$2.00	\$270.00	\$1.90	\$256.50	134.4	120						60					60				
06100-	00105	12" Stabilized Subgrade, County Spec 2300, less than 1000sy	1733	SY	\$3.75	\$6,498.75	\$2.20	\$3,812.60	\$2.20	\$3,812.60	1732.266667	1546.66667						330	24		880		250	24		666.666667	
06200-	00103	6" Graded aggregate Base "Min. LBR 100 at 100% Modified Proctor", County Spec 2400, less than 1000sy	1733	SY	\$14.50	\$25,128.50	\$13.00	\$22,529.00	\$14.50	\$25,128.50	1732.266667	1546.66667						330	24		880		250	24		666.666667	
08400-	00102	FDOT Type Reinforced Concrete Ditch Paving w/ Weep Holes, FDOT Index 281, Min 3.5" thick	11034	SY	\$38.00	\$419,292.00	\$42.00	\$463,428.00	\$37.95	\$418,740.30	11033.24444	9851.11111	3410	26		9851.111											
08500-	00102	Remove Concrete Swale	3395	SY	\$4.75	\$16,126.25	\$5.00	\$16,975.00	\$4.50	\$15,277.50	3394.844444	3031.11111	3410	8		3031.111											
13100-	00101	Centipede Sod, Staked	4261	SY	\$2.55	\$10,865.55	\$2.80	\$11,930.80	\$2.30	\$9,800.30	4260.977778	3804.44444	3410	6		2273.333		330	26		953.3333		200	26		577.777778	
13300-	00102	Silt Fence Type IV	896	LF	\$4.25	\$3,808.00	\$4.25	\$3,808.00	\$4.50	\$4,032.00	896	800	300					400					100				
			Sub Totals			\$599,220.32		\$622,114.35		\$575,221.65																	
07900-	00100	MOT Based on section 07900-00100 and sub total of project				\$0.00		\$0.00		\$0.00																	
01100-	00100	Performance and Payment Bond (Required for projects over \$25,000.00)				\$11,984.41		\$7,154.32		\$6,039.83																	
			Grand Total			\$611,204.73		\$629,268.67		\$581,261.48																	
			Balance of Line (may not exceed 25% of total cost)		Qty	Units																					
Bridge Demolition			2	EA	\$20,000.00	\$40,000.00		\$80,000.00	\$40,000.00	\$80,000.00																	
Bridge System (includes installation)			1	EA	\$115,000.00	\$115,000.00		\$115,000.00	\$115,000.00	\$115,000.00																	
Balance of Line Total						\$155,000.00		\$195,000.00		\$195,000.00																	
Additional Performance and Payment Bond						\$3,100.00		\$2,242.50		\$2,047.50																	
Revised Grand Total with BOL						\$769,304.73		\$826,511.17		\$778,308.98																	

Gatewood DSR
Preliminary Cost Estimate
DR #1 thru #6

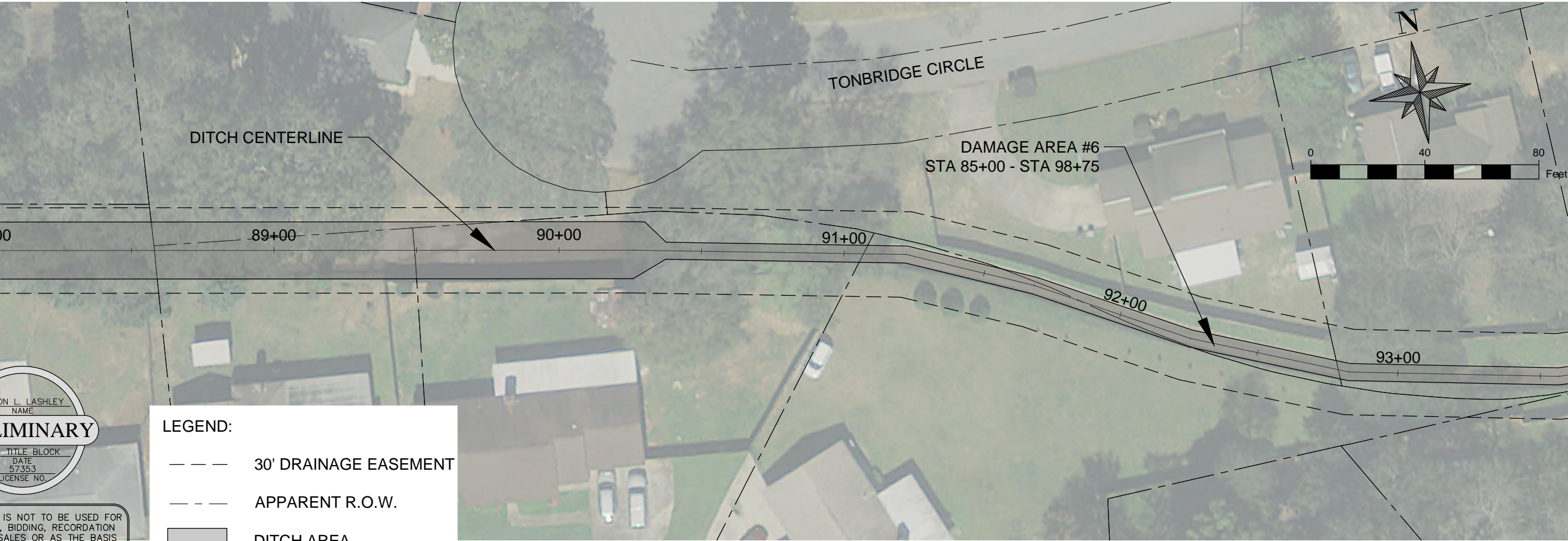
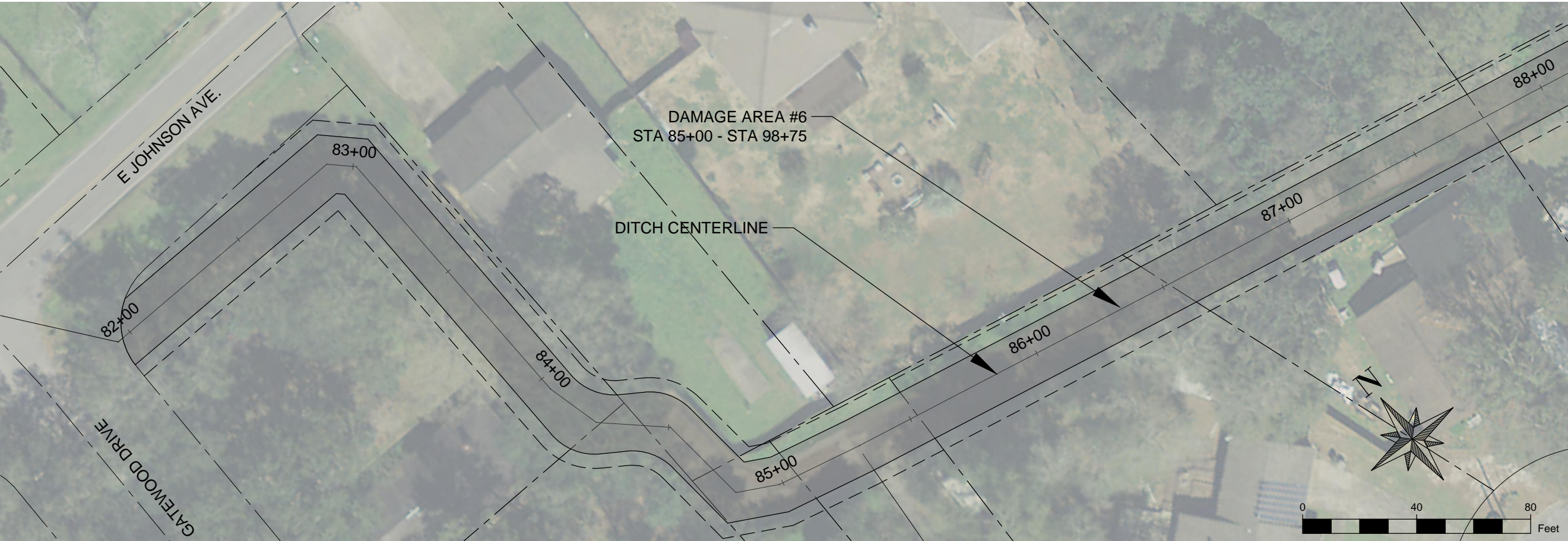
PD16-17.081 General Paving and Drainage Pricing Agreement					Chavers Construction, Inc.		Roads, Inc. of NWF		Site and Utility, LLC		12% Contingency	Totals Rounded	Essex Apartments : Drainage Repair #1				
Valid From December 1, 2018 to November 30, 2019													Length	Width	Depth	Area	Volume
Section	Category	Sub-Category	Quantity	Units	Unit Price	Ext Cost	Unit Price	Ext Cost	Unit Price	Ext Cost			(feet)	(feet)	(feet)	(SY)	(CY)
02100-	00104	Mobilization, 46 + Miles	8	EA	\$3,500.00	\$28,000.00	\$3,500.00	\$28,000.00	\$3,500.00	\$28,000.00	4	4					
03100-	00102	Clearing and Grubbing (Including Trees UNDER 12" dia.), per County Specifications 2230	3525	SY	\$2.45	\$8,636.25	\$2.00	\$7,050.00	\$2.00	\$7,050.00	3524.888889	3147.22222	35	25		97.22222	
03100-	00109	Remove Sand, Silt, & Vegetation From Existing Stormwater System	756	LF	\$12.50	\$9,450.00	\$15.00	\$11,340.00	\$20.00	\$15,120.00	756	675	50				
04100-	00104	Earthwork Borrow (Fill), FDOT Specification 120-2.2.2	153	CY	\$12.75	\$1,950.75	\$11.50	\$1,759.50	\$9.00	\$1,377.00	152.4444444	136.111111	25	15	3		41.66667
04100-	00106	Earthwork Establishing Grade, County Specs 2300	3525	SY	\$1.90	\$6,697.50	\$1.45	\$5,111.25	\$1.50	\$5,287.50	3524.888889	3147.22222	35	25		97.22222	
04100-	00108	Remove and Replace Unsuitable Materials	560	CY	\$14.55	\$8,148.00	\$13.00	\$7,280.00	\$15.00	\$8,400.00	560	500					
05200-	00107	2" County Spec 2500 Type SP 12.5 Asphalt, less than 1500sy	125	560	\$10.00	\$1,250.00	\$8.05	\$1,006.25	\$11.50	\$1,437.50	124.4444444	111.111111	25	15		41.66667	
05300-	00102	Install Asphalt Curbs	56	LF	\$15.00	\$840.00	\$10.00	\$560.00	\$15.00	\$840.00	56	50	25				
05300-	00103	Install 2" Thick Asphalt Swale	374	SY	\$35.00	\$13,090.00	\$18.00	\$6,732.00	\$25.00	\$9,350.00	373.3333333	333.333333					
05600-	00103	Remove Existing Asphalt Curbs	34	LF	\$3.45	\$117.30	\$2.00	\$68.00	\$3.00	\$102.00	33.6	30	15				
05600-	00105	Remove Existing Asphalt, 2" Average Depth	428	SY	\$3.23	\$1,382.44	\$2.00	\$856.00	\$3.00	\$1,284.00	427.7777778	381.944444	25	7.5		20.83333	
05600-	00108	Saw cut Existing Asphalt	146	LF	\$2.00	\$292.00	\$1.90	\$277.40	\$3.00	\$438.00	145.6	130	55				
06100-	00105	12" Stabilized Subgrade, County Spec 2300, less than 1000sy	125	SY	\$3.75	\$468.75	\$2.20	\$275.00	\$3.50	\$437.50	124.4444444	111.111111	25	15		41.66667	
06200-	00103	6" Graded aggregate Base "Min. LBR 100 at 100% Modified Proctor", County Spec 2400, less than 1000sy	125	SY	\$14.50	\$1,812.50	\$14.50	\$1,812.50	\$17.00	\$2,125.00	124.4444444	111.111111	25	15		41.66667	
08400-	00102	FDOT Type Reinforced Concrete Ditch Paving w/ Weep Holes, FDOT Index 281, Min 3.5" thick	1270	SY	\$38.00	\$48,260.00	\$37.95	\$48,196.50	\$55.00	\$69,850.00	1269.333333	1133.33333					
08500-	00102	Remove Concrete Swale	1270	SY	\$4.75	\$6,032.50	\$4.50	\$5,715.00	\$7.50	\$9,525.00	1269.333333	1133.33333					
08500-	00105	Remove Existing Curb	51	LF	\$4.75	\$242.25	\$4.50	\$229.50	\$5.00	\$255.00	50.4	45	20				
13100-	00101	Centipede Sod, Staked	1127	SY	\$2.55	\$2,873.85	\$2.30	\$2,592.10	\$3.50	\$3,944.50	1126.222222	1005.55556	25	20		55.55556	
13300-	00102	Silt Fence Type IV	336	LF	\$4.25	\$1,428.00	\$4.50	\$1,512.00	\$4.25	\$1,428.00	336	300	50				
14100-	00102	6' Chain Link Fence	476	LF	\$14.00	\$6,664.00	\$12.90	\$6,140.40	\$16.00	\$7,616.00	476	425	25				
14300-	00102	6' Wood Fence (Non alternating Vertical Boards)	560	LF	\$11.50	\$6,440.00	\$11.50	\$6,440.00	\$18.00	\$10,080.00	560	500					
14400-	00101	Remove Existing 6' Wood Fence	560	LF	\$3.00	\$1,680.00	\$3.00	\$1,680.00	\$4.00	\$2,240.00	560	500					
14400-	00103	Remove Existing Chain Link Fence	476	LF	\$3.00	\$1,428.00	\$3.00	\$1,428.00	\$4.00	\$1,904.00	476	425	25				
			Sub Totals			\$157,184.09		\$146,061.40		\$188,091.00							
07900-	00100	MOT Based on section 07900-00100 and sub total of project				\$1,500.00		\$4,500.00		\$5,500.00							
01100-	00100	Performance and Payment Bond (Required for projects over \$25,000.00)				\$3,173.68		\$1,580.89		\$4,839.78							
			Grand Total			\$161,857.77		\$152,142.29		\$198,430.78							
Balance of Line (may not exceed 25% of total cost)			Qty	Units													
LARGE TREE REMOVAL			6	EA	\$3,000.00	\$18,000.00		\$18,000.00		\$18,000.00	1		90				
						\$0.00		\$0.00		\$0.00							
Balance of Line Total						\$18,000.00		\$18,000.00		\$18,000.00							
Additional Performance and Payment Bond						\$360.00		\$189.00		\$450.00							
Revised Grand Total with BOL						\$180,217.77		\$170,331.29		\$216,880.78							

Gatewood DSR
Preliminary Cost Estimate
DR #1 thru #6

Essex Apartments : Drainage Repair #2					Essex Apartments : Drainage Repair #3					Essex Apartments : Drainage Repair #4					Essex Apartment to Tonbridge : Drainage Area #5					Tonbridge to Gatewood Drive Drainage Area #6				
Length	Width	Depth	Area	Volume	Length	Width	Depth	Area	Volume	Length	Width	Depth	Area	Volume	Length	Width	Depth	Area	Volume	Length	Width	Depth	Area	Volume
(feet)	(feet)	(feet)	(SY)	(CY)	(feet)	(feet)	(feet)	(SY)	(CY)	(feet)	(feet)	(feet)	(SY)	(CY)	(feet)	(feet)	(feet)	(SY)	(CY)	(feet)	(feet)	(feet)	(SY)	(CY)
100	14		155.5556		125	14		194.4444		32	100		355.5556		150	14		233.3333		950	20		2111.111	
100					125					100					150					150				
										25	25	3		69.44444	150	6	0.75		25					
100	14		155.5556		125	14		194.4444		32	100		355.5556		150	14		233.3333		950	20		2111.111	
										25	25		69.44444											
										25														
																				150	20		333.3333	
										15														
										25	10		27.77778							150	20		333.3333	
										75														
										25	25		69.44444											
										25	25		69.44444											
100	8		88.88889		125	8		111.1111		100	8		88.88889		150	8		133.3333		800	8		711.1111	
100	8		88.88889		125	8		111.1111		100	8		88.88889		150	8		133.3333		800	8		711.1111	
										25														
100	6		66.66667		125	6		83.33333		100	6		66.66667		150	6		100		950	6		633.3333	
50					50					50					50					50				
																				400				
										100										400				
										100										400				
																				400				

APPENDIX D:
REPAIR PLAN SHEETS

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PRELIMINARY

JASON L. LASHLEY
NAME

SEE TITLE BLOCK
DATE
57353
LICENSE NO.

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CONVEYANCE, SALES OR AS THE BASIS
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LEGEND:

--- 30' DRAINAGE EASEMENT

--- APPARENT R.O.W.

□ DITCH AREA

SIGMA
CONSULTING
GROUP, INC.

3298 SUMMIT BOULEVARD, SUITE 32
PENSACOLA, FLORIDA 32503
PHONE: (850) 332-7812
CERTIFICATE OF AUTHORIZATION #26889

BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

**GATEWOOD DITCH
CONCEPTUAL DAMAGE
REPAIRS
DAMAGE AREA #6**

NO.	REVISION	DATE

Project Number:
180406

Date:
DECEMBER 2020

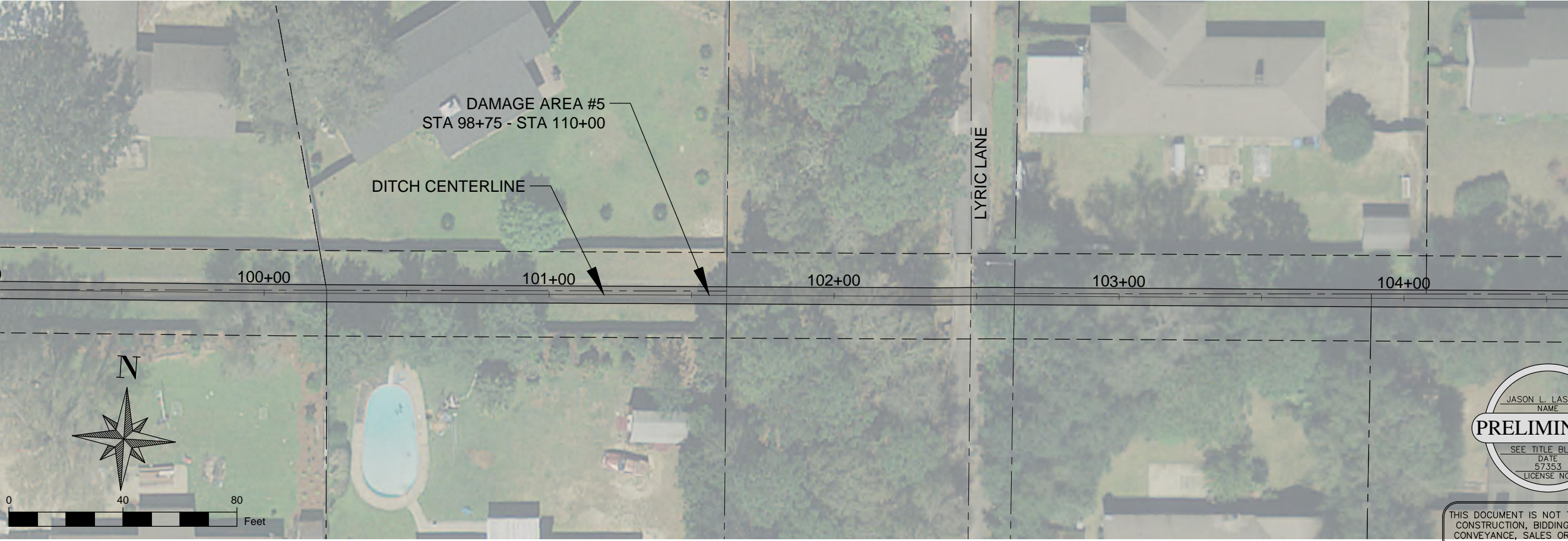
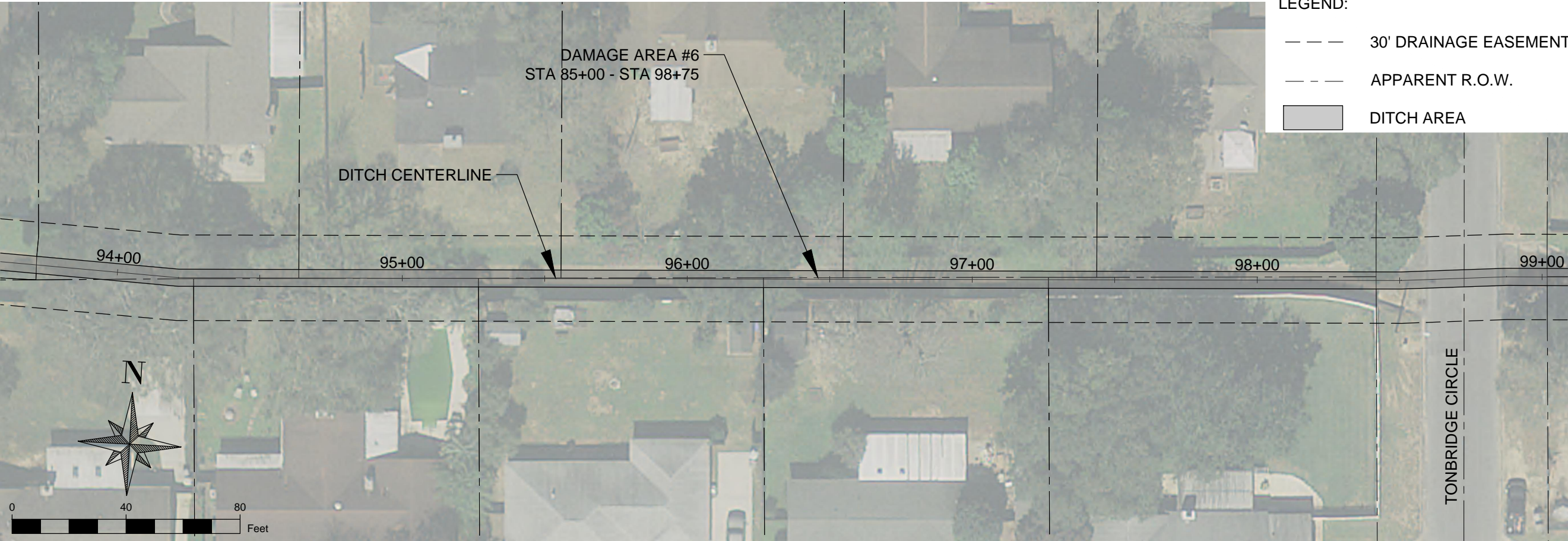
Drawn By:
F.E.A.

Designed By:
F.E.A.

Checked By:
J.L.L.

Sheet:
1

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JASON L. LASHLEY
NAME

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Project Number:	180406
Date:	DECEMBER 2020
Drawn By:	F.E.A.
Designed By:	F.E.A.
Checked By:	J.L.L.
Sheet:	2

GATEWOOD DITCH
CONCEPTUAL DAMAGE
REPAIRS

DAMAGE AREA #5/6

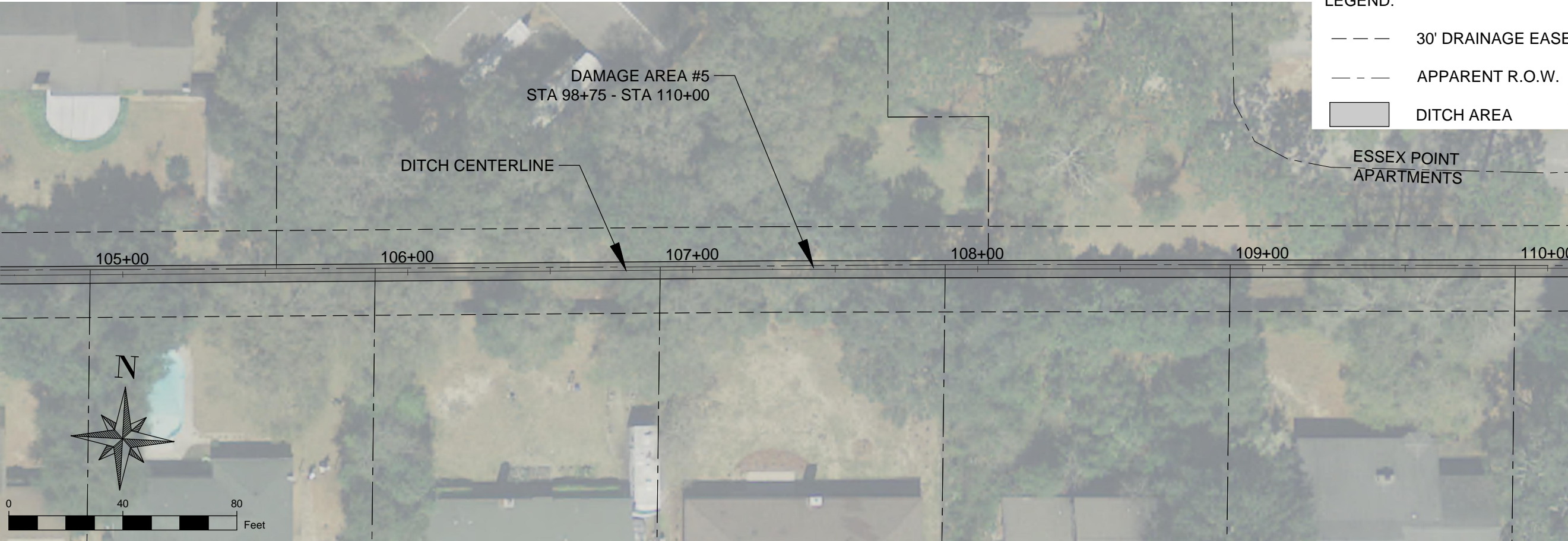


BOARD OF COUNTY COMMISSIONERS
ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

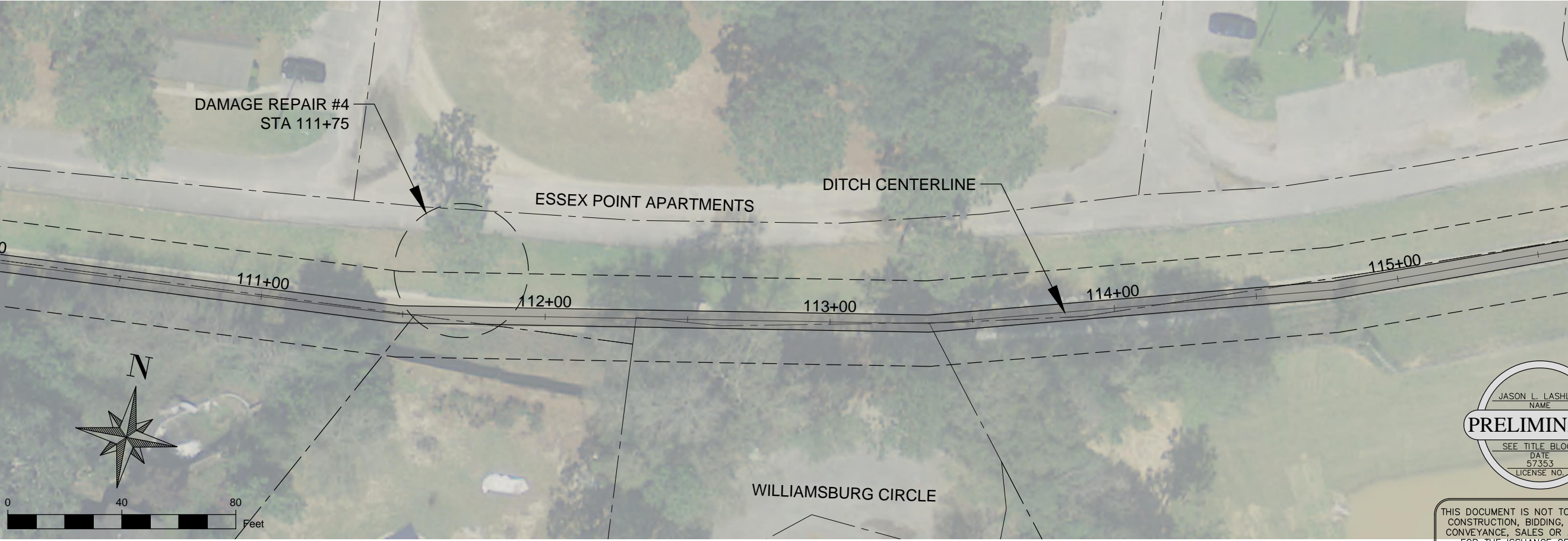


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PENSACOLA, FLORIDA 32503
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CERTIFICATE OF AUTHORIZATION #26889

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- LEGEND:
- 30' DRAINAGE EASEMENT
 - APPARENT R.O.W.
 - DITCH AREA



JASON L. LASHLEY
NAME
PRELIMINARY
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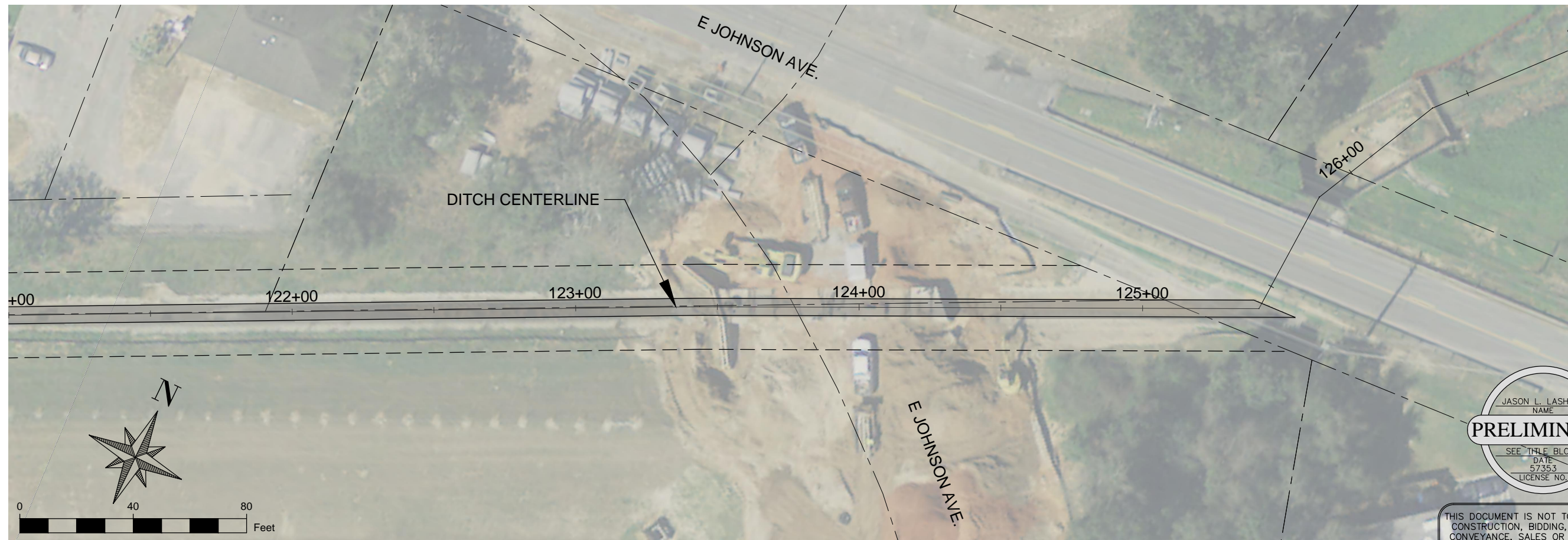
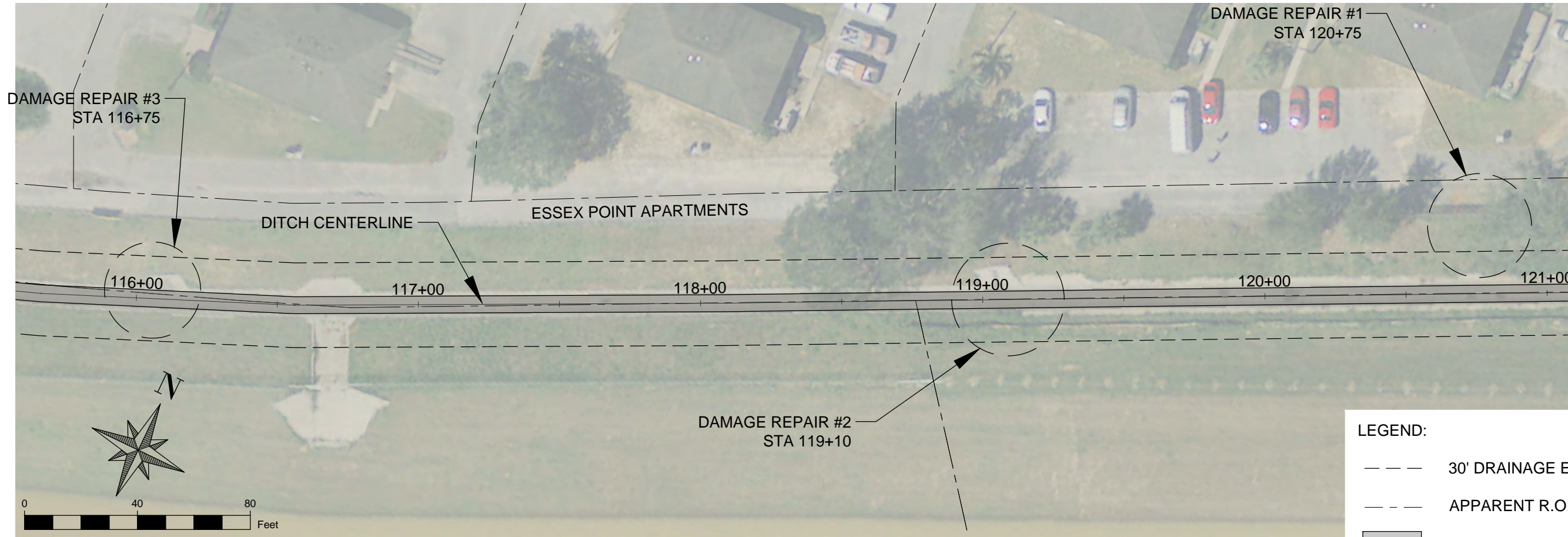
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GATEWOOD DITCH
CONCEPTUAL DAMAGE
REPAIRS
DAMAGE REPAIR/AREA #4/5

NO.	REVISION	DATE

Project Number:
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DECEMBER 2020
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ESCAMBIA COUNTY, FLORIDA
ENGINEERING DEPARTMENT

GATEWOOD DITCH
CONCEPTUAL DAMAGE
REPAIRS
DAMAGE REPAIR #1-3

NO.	REVISION	DATE

Project Number:
180406
Date:
DECEMBER 2020
Drawn By:
F.E.A.
Designed By:
F.E.A.
Checked By:
J.L.L.
Sheet:
4