

Segment #27 – Warrington Road



TECHNICAL MEMORANDUM

TO: Sarah Coakley, Regional Planner, Regional Systems Planning
DATE: 8/7/19
FROM: Bill Dougherty, JMT
PROJECT: Henlopen TID; Segment 27: Warrington Road
JMT JOB NO.: 16-0643-002
RE: Concept Assumptions and Summary
CC: Marc Cote, Mir Wahed, Brad Herb

Site Visit Date: 1/11/2018
Concurrence Meeting Date: 1/23/2018

Existing Conditions

Warrington Road (S 275) is a 0.68-mile major collector within Investment Strategy Level 2 and an ADT of 10,909 (2015). The 40' wide road is currently striped with asphalt paving and open drainage. Warrington Road is currently posted at 45 mph. Therefore, a 50-mph design speed was utilized for conceptual design. The Estates at Seachase Subdivision currently exists along the road way in addition to some vacant farm land on the east and west side of Warrington Road on the northern side of the corridor.

Road Site Conditions

- OPC Index (85.2) Level 3.
- 40' asphalt paved roadway.
- 2-11' travel lanes, 2-9' shoulders.

Design Elements

- Realign Warrington Road to tie into the proposed realignment of Plantation Road and John J Williams Highway (SR 24).
- The horizontal roadway curvature of Warrington Road between Stations 2707+00 and 2715+00 is substandard with the posted speed limit according to AASHTO's A Policy on the Geometric Design of Highways and Streets (Green Book).

Utility Conflicts

- Wood utility poles run along the west side of Warrington Road. The attached concept proposes the realignment of the utility poles as needed to be outside of the prescribed clear zone.

Potential for Future Development:

- Large open fields exist on the west and east side of Warrington Road near the intersection of John J Williams Highway (SR 24).

Multi-modal Analysis

- Delaware Bike Route 1 utilizes Warrington Road. No Bike lane striping currently exists along the road.

Recommendations

- Repave existing 40' roadway and improve the insufficient radius that currently exists.
- Construct a 5' sidewalk along the northern side of the roadway. Construct drainage swale between the sidewalk and the roadway.
- Construct drainage and BMP on the southern side of the roadway.
- Recommending signalizing Old Landing Road intersection with Warrington Road or install a roundabout.
- If roundabout alternative is selected, lighting is recommended at the roundabout at Old Landing Road.
- Realign Warrington Road to tie into realigned Plantation Road and John J Williams Highway (SR 24) by adding an additional northbound lane and eliminating a south bound lane.
- Recommending Warrington Road to be a high priority for implementation.
- Total cost of improvements (with signalized intersection) is estimated as \$3,544,040.
- Total cost of improvements (with roundabout) is estimated as \$4,022,175 (this estimate includes approximately 500' Old Landing Road reconstruction, previously included under Segment #30 with signal).
- See attached concept plans for more information.

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Henlopen TID. - Segment 27: Warrington Road 275(Sign: Sussex
Subdivision or Road Name County

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Warrington Road</u>	<u>SR24</u>	<u>Old Landing Road</u>	<u>0.68 Mi.</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation _____
Name Estimate only Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Reconstruction of 40' asphalt roadway. 2-11' travel lanes with 2-9' shoulders. Improve curvature of the roadway to match AASHTO's policy on the Geometric Design of Highways and Streets (Green Book).

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

Proposed: 2-11' lanes, 2-9' paved shoulders, and a 5' sidewalk on the north side of the road.

See concept plans for more information.

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$46,200</u>	Part I <u>Bill Dougherty, JMT</u>	<u>08/07/19</u>
b. Preliminary Engineering	<u>\$226,600</u>	Part II <u>Bill Dougherty, JMT</u>	<u>08/07/19</u>
c. Real Estate	<u>\$935,000</u>	Part III <u>Bill Dougherty, JMT</u>	<u>08/07/19</u>
d. Construction *	<u>\$2,336,240</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>08/07/19</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$3,544,040</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date _____ Assistant Director, M&O/Transportation Solutions/Planning _____ Date _____

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201769002

Project Title: Henlopen TID-Segment 27: Warrington Road (Signal)

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$ 13,751.56</u>	E. HISTORIC	<u>\$6,876</u>
B. ARCHAEOLOGY	<u>\$6,876</u>	1. Phase 1 (study)	<u>\$ 6,875.78</u>
1. Phase I (study)	<u>\$ 6,875.78</u>	2. Phase 2 (study)	<u>\$ -</u>
2. Phase 2 (study)	<u>\$ -</u>	3. Mitigation (by loc./env.)	<u>\$ -</u>
3. Phase 3 (mitigation)	<u>\$ -</u>	4. Mitigation (by design)	yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
C. WETLANDS	<u>\$13,752</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$ 6,875.78</u>	1. Studies	<u>\$ -</u>
2. Permit preparation	<u>\$ 6,875.78</u>	2. Mitigation (by design)	yes <input type="checkbox"/> no <input type="checkbox"/>
3. Mitigation (design)	<u>\$ -</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	<u>\$ -</u>
1. Phase 1 (study)	<u>\$ -</u>	2. _____	<u>\$ -</u>
2. Phase 2 (study)	<u>\$ -</u>		
3. Phase 3 (remediation)	<u>\$ -</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$42,000

CONTINGENCY COSTS 10% \$4,200
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$46,200
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 08/07/19

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201769002

Project Title: Henlopen TID-Segment 27: Warrington Road (Signal)

PART II - PRELIMINARY ENGINEERING

A. SURVEYS

	<u>\$13,752</u>
1. Inhouse	<u>\$ -</u>
2. Consultant	<u>\$ 13,751.56</u>

B. DESIGN ENGINEERING

	<u>\$192,209</u>
1. Design	<u>\$137,516</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 137,516.00</u>
2. Traffic	<u>\$13,752</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 13,751.56</u>
3. Real Estate Plan Preparation	<u>\$13,752</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ 13,751.56</u>
4. Utilities	<u>\$17,189</u>
a. Inhouse	<u>\$ 6,875.78</u>
b. Consultant	<u>\$ 6,875.78</u>
c. Test Holes	<u>\$ 3,437.89</u>
d. Utility Company	<u>\$ -</u>
5. Materials & Research	<u>\$ 5,000.00</u>
6. Borings	<u>\$ 5,000.00</u>
7. Pile Load Tests	<u>\$ -</u>

8. Subdivision	<u>\$0</u>
a. Inhouse	<u>\$ -</u>
b. Consultant	<u>\$ -</u>
c. Railroad P.E.	<u>\$ -</u>

9. Other (specify)	<u>\$0</u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

C. ENVIRON. ASSESSMENT

(use for class "II" projects only)

	<u>\$0</u>
1. Wetlands	<u>\$ -</u>
2. Hazardous Materials	<u>\$ -</u>
3. Noise	<u>\$ -</u>
4. Historic	<u>\$ -</u>
5. Archaeology	<u>\$ -</u>
6. Other	<u>\$ -</u>
a. _____	<u>\$ -</u>
b. _____	<u>\$ -</u>

Loc/Environ

Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin

Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED

\$206,000

CONTINGENCY COSTS

(normally 5% for large projects and 10% for small projects - to be approved by section head)

10% \$20,600
(% used)

TOTAL PRELIMINARY ENGINEERING

(also total for Construction Project Estimate form line 7b)

\$226,600

Estimator: Bill Dougherty, JMT

Date: 08/07/19

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201769002

Project Title Henlopen TID-Segment 27: Warrington Road (Signal)

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION

	<u>\$1,204,901</u>
1. Grading	
a. Excavation (includes SWM pond)	<u>\$145,617</u>
b. Borrow	<u>\$17,420</u>
2. Drainage	<u>\$55,006</u>
3. Pavement	
a. Surface	<u>\$366,878</u>
b. Base	<u>\$211,035</u>
c. Subbase	<u>\$103,700</u>
4. Erosion/Sed. Cont.	<u>\$34,379</u>
5. Miscellaneous	
a. Curb/Gutter	<u>\$13,694</u>
b. Sidewalk	<u>\$198,495</u>
c. Guardrail	<u>\$0</u>
d. C.P.M. Schedule	<u>\$1,800</u>
e. Clear/Grubb	<u>\$34,379</u>
f. Field Office	<u>\$22,500</u>
Other (specify)	
g. <u>Shared Use Path</u>	<u>\$0</u>
h. _____	_____
i. _____	_____
j. _____	_____
k. _____	_____
l. _____	_____
m. _____	_____

B. STRUCTURE CONSTRUCTION

	<u>\$0</u>
1. New Bridge	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____
2. Old Structure Rem.	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
3. Retaining Wall	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
4. Box Culvert	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____

C. LANDSCAPING

	<u>\$96,002</u>
1. Beautification	<u>\$82,250</u>
2. Noise Mitigation	<u>\$0</u>
3. Visual Mitigation	<u>\$0</u>
4. Tree Mitigation	<u>\$13,752</u>

D. MAINTENANCE OF TRAFFIC \$ 27,503.12

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201769002

Project Title Henlopen TID-Segment 27: Warrington Road (Signal)

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$30,750</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ -
3. Pavement Markings	\$ 30,750.00
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT	<u>\$16,000</u>
1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. <u>Elec Pole Relocation</u>	<u>\$ 16,000.00</u>

H. SUBTOTAL (A thru G) ROUNDED \$1,376,000

I. MISC. ITEMS	<u>\$206,400</u>
(15% of H for large projects and 20% for small)	
(At SF submission use 10% and 5%)	
	<u>15%</u>
	(% used)

J. CONTRACTOR'S CONST. ENG.	<u>\$68,800</u>
(normally 5% of H)	
	<u>5%</u>
	(% used)

K. INITIAL EXPENSE	<u>\$68,800</u>
(normally 5% of H)	
	<u>5%</u>
	(% used)

L. CONSTRUCTION CONTINGENCY	<u>\$137,600</u>
(normally 10% of H)	
	<u>10%</u>
	(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$1,857,600
(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) \$278,640
(Enter on PNR funding line 4) 15%
(% used)

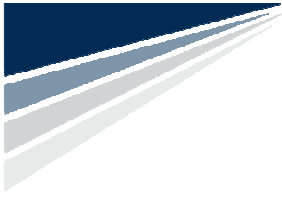
O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$2,136,240
(use this total + Q + P for Construction Project Estimate from line 7d)

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	<u>\$0</u>
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	
Utilities	
Estimator:	Date:

Q. TRAFFIC SECTION ITEMS	<u>\$200,000</u>
(Enter on PNR funding line 6)	
1. Signing	
2. Signals	<u>\$200,000</u>
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	
Traffic	
Estimator:	Date:

Estimator: Bill Dougherty, JMT

Date: 8/7/2019



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



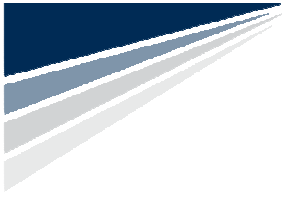
DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (SIGNAL)

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.0%	\$ 13,752
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 6,876
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 6,876
2. Permit Preparation	0.5%	\$ 6,876
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 6,876
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (SIGNAL)

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	1.0%	\$ 13,752
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	10.0%	\$ 137,516
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	1.0%	\$ 13,752
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.0%	\$ 13,752
4. Utilities		
a. Inhouse	0.5%	\$ 6,876
b. Consultant	0.5%	\$ 6,876
c. Test Holes	0.25%	\$ 3,438
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



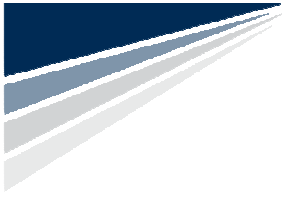
DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (SIGNAL)

Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 5.74	\$ 3.450
Agricultural Residential AR-2R Residential	AR-2R	\$ 5.74	\$ 3.450
General Residential - GR	GR	\$ 5.74	\$ 3.450
Medium Residential	MR	\$ 5.74	\$ 3.450
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)		
334-12.00-187.00	AR-1R	N		106.79	\$ 612.98	656.11	\$ 3,766.06				
334-12.00-125.00	AR-1R	N		4,645.16	\$ 26,663.23	3,063.39	\$ 17,583.84				
334-12.00-115.00	AR-1R	N		442.71	\$ 2,541.18	2,046.14	\$ 11,744.82				
334-12.00-116.00	AR-1R	N		3,219.80	\$ 18,481.65	20,183.51	\$ 115,853.34				
334-12.00-125.01	AR-1R	N		8,832.46	\$ 50,698.34	-	\$ -				
334-12.00-127.04	AR-1R	N		2,395.58	\$ 13,750.64	-	\$ -				
334-12.00-127.02	AR-1R	N		1,116.84	\$ 6,410.69	-	\$ -				
334-12.00-127.05	AR-1R	N		1,106.83	\$ 6,353.21	188.38	\$ 1,081.27				
334-12.00-117.00	AR-1R	N		900.91	\$ 5,171.25	1,424.67	\$ 8,177.58				
334-12.00-118.00	AR-1R	N		1,777.49	\$ 10,202.82	1,654.07	\$ 9,494.37				
334-12.00-118.02	AR-1R	N		2,682.11	\$ 15,395.29	2,081.71	\$ 11,949.03				
334-12.00-118.01	AR-1R	N		3,006.04	\$ 17,254.66	2,119.71	\$ 12,167.12				
334-12.00-122.03	AR-1R	N		2,976.28	\$ 17,083.84	119.59	\$ 686.44				
334-12.00-119.00-1	AR-1R	N		3,049.92	\$ 17,506.52	-	\$ -				
334-12.00-124.01	AR-1R	N		326.68	\$ 1,875.17	1,272.46	\$ 7,303.95				
334-12.00-124.00	AR-1R	N		2,214.99	\$ 12,714.04	5,661.19	\$ 32,495.25				
334-12.00-122.00	AR-1R	N		4,304.08	\$ 24,705.43	-	\$ -				
334-12.00-121.01	AR-1R	N		10,278.15	\$ 58,996.56	-	\$ -				
334-13.00-263.00	AR-1R	N		2,527.77	\$ 14,509.38	331.41	\$ 1,902.29				
334-12.00-178.00	AR-1R	N		2,030.57	\$ 11,655.49	1,282.70	\$ 7,362.70				
334-12.00-192.00	AR-1R	N		1,568.44	\$ 9,002.84	324.47	\$ 1,862.47				
334-12.00-191.00	AR-1R	N		1,059.72	\$ 6,082.81	-	\$ -				
334-12.00-121.02	AR-1R	N		1,404.10	\$ 8,059.51	-	\$ -				
334-12.00-121.00	AR-1R	N		612.75	\$ 3,517.16	-	\$ -				
Total:			0	Total:		359,244.70	Total:		243,430.51	Total:	0

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Appraisal Fees: \$ 24,000.00 Number of Parcels Impacted X \$1,000
 Staff: \$ 60,000.00 Number of Parcels Impacted X \$2,500
 Settlement: \$ 13,200.00 Number of Parcels Impacted X \$550



Appendix C

Backup Calculations for Part IV - Construction

DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (SIGNAL)

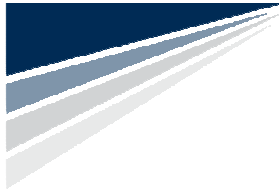
General Roadway Data					
General Data		Roadway Box		Asphalt Unit Wt. (lb./CF)	
Length of Road Segment (LF)	3525	Type C Depth (in)	2	Type C	151.3
Existing Roadway Width (LF)	40	Type B Depth (in)	4	Type B	153.5
Proposed Roadway Width (LF)	40	BCBC Depth (in)	6	BCBC	151.5
Widening Width (LF)	0	GABC Depth (in)	8	Project Duration (Assume 12 Mo/Mile)	
Overlay Area (SF)	144117				
Widening/Reconstruction Area (SF)	68811	SUP Pavement Box		Duration (Month)	9
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2		
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8		
Length of 5' Wide Sidewalk (LF)	3609	SW Pavement Box			
Area of 5' Wide Sidewalk (SF)	18045	Concrete Depth (in) (Typ 4")	4		
Length of Curb/Gutter	537	GABC Depth (in) (Typ 4")	4		
Area of Triangular Concrete Islands	0				
Length of Ditch Runs (LF)	6543				
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11				

CELLS IN BLUE SHADE ARE AUTOMATED.
EDITING IS NOT REQUIRED.

Cost Derivation							
				%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading							
202000	Excavation and Embankment						
	Roadway Box Excavation	CY	NA	4248	\$ 19.75	\$ 83,898.00	
	SUP Excavation	CY	NA	0	\$ 19.75	\$ -	
	Sidewalk Excavation	CY	NA	90	\$ 19.75	\$ 1,777.50	
	Ditch Excavation	CY	NA	2666	\$ 19.75	\$ 52,653.50	
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	369	\$ 19.75	\$ 7,287.75	
Total:						\$ 145,616.75	
A.1.b: Borrow							
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	1106	\$ 15.75	\$ 17,419.50	
A.2: Drainage							
	General Drainage of project cost	LS	4%	1	\$ 55,006.24	\$ 55,006.24	
A.3.a: Pavement Surface							
401006	Superpave Type C, PG 70-22	Ton	NA	2686	\$ 82.50	\$ 221,595.00	
401015	Superpave Type B, PG 70-22	Ton	NA	1761	\$ 82.50	\$ 145,282.50	
Total:						\$ 366,877.50	
A.3.b: Pavement Base							
401021	Superpave Type BCBC, PG 64-22	Ton	NA	2607	\$ 75.00	\$ 195,525.00	
762000	Sawcutting, Bituminous Concrete	LF	NA	7050	\$ 2.20	\$ 15,510.00	
Total:						\$ 211,035.00	
A.3.c: Pavement Subbase							
301001	Graded Aggregate Base Course, Type B	CY	NA	1700	\$ 61.00	\$ 103,700.00	
A.4: Erosion/Sediment Control							
	General E&S (2.5%) of Overall Project Cost	LS	2.5%	1	\$ 34,378.90	\$ 34,378.90	

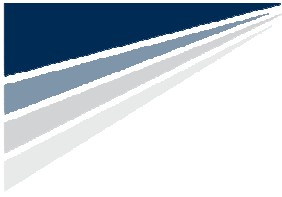
DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (SIGNAL)

A.5.a: Miscellaneous Curb/Gutter						
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA	537	\$ 25.50	\$ 13,693.50
702000	Triangular Channelizing Islands	SF	NA	0	\$ 70.00	\$ -
Total:						\$ 13,693.50
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	18045	\$ 11.00	\$ 198,495.00
Total:						\$ 198,495.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ -	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ -	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	9	\$ 200.00	\$ 1,800.00
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (2.5%) of project cost	LS	2.5%	1	\$ 34,378.90	\$ 34,378.90
A.5.f: Field Office						
		EAMO	NA	9	\$ 2,500.00	\$ 22,500.00
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 82.50	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 61.00	\$ -
Total:						\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	11750	\$ 1.00	\$ 11,750.00
908004	Topsoil, 6" Depth	SY	NA	11750	\$ 6.00	\$ 70,500.00
Total:						\$ 82,250.00
C.2: Noise Mitigation			0%	1	\$ -	\$ -
C.3: Visual Mitigation			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost			1%	1	\$ 13,751.56	\$ 13,751.56
D: Maintenance of Traffic						
801000	Maintenance of Traffic (2.5%) of project cost	LS	1.0%	1	\$ 13,751.56	\$ 13,751.56
	Detour Route (1%) of project cost	LS	1%	1	\$ 13,751.56	\$ 13,751.56
Total:						\$ 27,503.12
E.1.a: Signing Structures: Overhead Bridges		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports		LS			\$ -	\$ -



DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (SIGNAL)

E.2: Roadway Lighting						
Intersection Lighting		LS		0	\$ 25,000.00	\$ -
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5"	LF		21150	\$ 1.00	\$ 21,150.00
	Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	Each		60	\$ 160.00	\$ 9,600.00
Total:						\$ 30,750.00
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Elec. Pole Relocation		EA		8	\$ 2,000.00	\$ 16,000.00
H: Subtotal						\$ 1,375,155.97



Appendix D Concept Plans

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Henlopen TID-Seg 27: Warrington Rd (w/roundabout) Sussex
County
Subdivision or Road Name

2. LIMITS

Street Name or Road Number	From	To	Length
<u>Warrington Road</u>	<u>SR24</u>	<u>Old Landing Road</u>	<u>0.68 Mi.</u>

3. ESTIMATE REQUESTED BY: DelDOT Planning for (check one) Project initiation Estimate only
Name Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

Reconstruction of 40' asphalt roadway. 2-11' travel lanes with 2-9' shoulders. Improve curvature of the roadway to match AASHTO's policy on the Geometric Design of Highways and Streets (Green Book).

Install roundabout at Old Landing Road and Warrington road intersection.

4. PROJECT IN C.I.P. Yes No If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

6. STATE MAINTAINED CITY MAINTAINED PRIVATE OTHER (specify) _____

7. COST ESTIMATE:	from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	<u>\$55,000</u>	Part I <u>Bill Dougherty, JMT</u>	<u>08/07/19</u>
b. Preliminary Engineering	<u>\$269,500</u>	Part II <u>Bill Dougherty, JMT</u>	<u>08/07/19</u>
c. Real Estate	<u>\$1,167,100</u>	Part III <u>Bill Dougherty, JMT</u>	<u>08/07/19</u>
d. Construction *	<u>\$2,530,575</u>	Part IV <u>Bill Dougherty, JMT</u>	<u>08/07/19</u>
e. TOTAL ESTIMATED PROJECT COST	<u>\$4,022,175</u>		

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ Date Assistant Director, M&O/Transportation Solutions/Planning _____ Date

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part I of V

Contract No. T201769002

Project Title: Henlopen TID-Seg 27: Warrington Rd (w/roundabout)

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)	<u>\$ 16,458.32</u>	E. HISTORIC	<u>\$8,229</u>
B. ARCHAEOLOGY	<u>\$8,229</u>	1. Phase 1 (study)	<u>\$ 8,229.16</u>
1. Phase I (study)	<u>\$ 8,229.16</u>	2. Phase 2 (study)	<u>\$ -</u>
2. Phase 2 (study)	<u>\$ -</u>	3. Mitigation (by loc./env.)	<u>\$ -</u>
3. Phase 3 (mitigation)	<u>\$ -</u>	4. Mitigation (by design)	<u>yes <input type="checkbox"/> no <input checked="" type="checkbox"/></u>
C. WETLANDS	<u>\$16,458</u>	F. NOISE	<u>\$0</u>
1. Delineation (study)	<u>\$ 8,229.16</u>	1. Studies	<u>\$ -</u>
2. Permit preparation	<u>\$ 8,229.16</u>	2. Mitigation (by design)	<u>yes <input type="checkbox"/> no <input type="checkbox"/></u>
3. Mitigation (design)	<u>\$ -</u>	G. OTHER	<u>\$0</u>
D. HAZARDOUS MATERIAL	<u>\$0</u>	1. _____	<u>\$ -</u>
1. Phase 1 (study)	<u>\$ -</u>	2. _____	<u>\$ -</u>
2. Phase 2 (study)	<u>\$ -</u>		
3. Phase 3 (remediation)	<u>\$ -</u>		

TOTAL COSTS FOR PART I (A thru G) ROUNDED \$50,000

CONTINGENCY COSTS 10% \$5,000
 (normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS \$55,000
 (also total for Construction Project Estimate form line 7a)

Estimator: Bill Dougherty, JMT

Date: 08/07/19

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part II of V

Contract No. T201769002

Project Title: Henlopen TID-Seg 27: Warrington Rd (w/roundabout)

PART II - PRELIMINARY ENGINEERING

A. SURVEYS

\$16,458

- 1. Inhouse \$ -
- 2. Consultant \$ 16,458.32

B. DESIGN ENGINEERING

\$228,074

- 1. Design \$164,584
 - a. Inhouse \$ -
 - b. Consultant \$ 164,584.00

- 2. Traffic \$16,458
 - a. Inhouse \$ -
 - b. Consultant \$ 16,458.32

- 3. Real Estate Plan Preparation \$16,458
 - a. Inhouse \$ -
 - b. Consultant \$ 16,458.32

- 4. Utilities \$20,573
 - a. Inhouse \$ 8,229.16
 - b. Consultant \$ 8,229.16
 - c. Test Holes \$ 4,114.58
 - d. Utility Company \$ -

- 5. Materials & Research \$ 5,000.00

- 6. Borings \$ 5,000.00

- 7. Pile Load Tests \$ -

- 8. Subdivision \$0
 - a. Inhouse \$ -
 - b. Consultant \$ -
 - c. Railroad P.E. \$ -

- 9. Other (specify) \$0
 - a. _____ \$ -
 - b. _____ \$ -

C. ENVIRON. ASSESSMENT

\$0

(use for class "II" projects only)

- 1. Wetlands \$ -
- 2. Hazardous Materials \$ -
- 3. Noise \$ -
- 4. Historic \$ -
- 5. Archaeology \$ -
- 6. Other
 - a. _____ \$ -
 - b. _____ \$ -

Loc/Environ

Estimator: _____ Date: _____

D. CONTRACT ADMINISTRATION

Cont/Admin

Estimator: _____ Date: _____

TOTAL COSTS FOR PART II (A thru D) ROUNDED

\$245,000

CONTINGENCY COSTS

(normally 5% for large projects and 10% for small projects - to be approved by section head)

10% \$24,500
(% used)

TOTAL PRELIMINARY ENGINEERING

(also total for Construction Project Estimate form line 7b)

\$269,500

Estimator: Bill Dougherty, JMT

Date: 08/07/19

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-A of V

Contract No. T201769002

Project Title Henlopen TID-Seg 27: Warrington Rd (w/roundabout)

PART IV -CONSTRUCTION

**A. ROADWAY/APPROACH
CONSTRUCTION**

	<u>\$1,395,491</u>
1. Grading	
a. Excavation (includes SWM pond)	<u>\$118,283</u>
b. Borrow	<u>\$14,159</u>
2. Drainage	<u>\$65,833</u>
3. Pavement	
a. Surface	<u>\$233,063</u>
b. Base	<u>\$225,873</u>
c. Subbase	<u>\$0</u>
4. Erosion/Sed. Cont.	<u>\$41,146</u>
5. Miscellaneous	
a. Curb/Gutter	<u>\$386,059</u>
b. Sidewalk	<u>\$245,630</u>
c. Guardrail	<u>\$0</u>
d. C.P.M. Schedule	<u>\$1,800</u>
e. Clear/Grubb	<u>\$41,146</u>
f. Field Office	<u>\$22,500</u>
Other (specify)	
g. <u>Shared Use Path</u>	<u>\$0</u>
h. _____	_____
i. _____	_____
j. _____	_____
k. _____	_____
l. _____	_____
m. _____	_____

**B. STRUCTURE
CONSTRUCTION**

	<u>\$0</u>
1. New Bridge	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____
2. Old Structure Rem.	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
3. Retaining Wall	_____
a. Type	_____
b. Size	_____
c. \$/c.y.	_____
4. Box Culvert	_____
a. Type	_____
b. Size	_____
c. \$/s.f.	_____

C. LANDSCAPING

	<u>\$100,234</u>
1. Beautification	<u>\$83,776</u>
2. Noise Mitigation	<u>\$0</u>
3. Visual Mitigation	<u>\$0</u>
4. Tree Mitigation	<u>\$16,458</u>

D. MAINTENANCE OF TRAFFIC \$ 57,604.12

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Part IV-B of V

Contract No. T201769002

Project Title Henlopen TID-Seg 27: Warrington Rd (w/roundabout)

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	<u>\$76,502</u>
1. Signing Structures	
a. Overhead Bridges	\$ -
b. Cantilever Supports	\$ -
2. Roadway Lighting	\$ 50,000.00
3. Pavement Markings	\$ 26,502.40
Other (specify)	
4. _____	

F. WETLAND MITIGATION \$0

G. UTILITY RELOC. IN CONTRACT \$0

1. Water	\$ -
2. Sanitary Sewer	\$ -
Other (specify)	
3. _____ Elec. Pole Relocation	

H. SUBTOTAL (A thru G) ROUNDED \$1,630,000

I. MISC. ITEMS \$244,500

(15% of H for large projects and 20% for small)
(At SF submission use 10% and 5%)

15%
(% used)

J. CONTRACTOR'S CONST. ENG. \$81,500

(normally 5% of H) 5%
(% used)

K. INITIAL EXPENSE \$81,500

(normally 5% of H) 5%
(% used)

L. CONSTRUCTION CONTINGENCY \$163,000

(normally 10% of H) 10%
(% used)

M. TOTAL CONSTRUCTION COSTS (H thru L) \$2,200,500

(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% \$330,075

(Enter on PNR funding line 4) (% used)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) \$2,530,575

(use this total + Q + P for Construction Project Estimate from line 7d)

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS \$0

(Enter on PNR funding line 7)

1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7. _____	
8. _____	

Utilities
Estimator: _____ Date: _____

Q. TRAFFIC SECTION ITEMS \$0

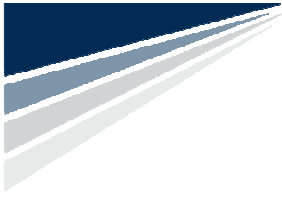
(Enter on PNR funding line 6)

1. Signing	
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5. _____	

Traffic
Estimator: _____ Date: _____

Estimator: Bill Dougherty, JMT

Date: 8/7/2019



Appendix A
Backup Calculations for
Part I-Location and Environmental Studies
Part II - Preliminary Engineering



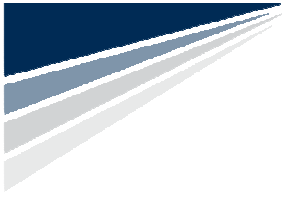
DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (WITH ROUNDABOUT)

PART 1 LOCATION AND ENVIRONMENTAL STUDIES		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Engineering (Includes NEPA)	1.0%	\$ 16,458
B. Archeology		
1. Phase 1 (study)	0.5%	\$ 8,229
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (mitigation)	0.0%	\$ -
C. Wetlands		
1. Delineation (study)	0.5%	\$ 8,229
2. Permit Preparation	0.5%	\$ 8,229
3. Mitigation (design)	0.0%	\$ -
D. Hazardous Material		
1. Phase 1 (study)	0.0%	\$ -
2. Phase 2 (study)	0.0%	\$ -
3. Phase 3 (remediation)	0.0%	\$ -
E. Historic		
1. Phase 1 (study)	0.5%	\$ 8,229
2. Phase 2 (study)	0.0%	\$ -
3. Mitigation (by loc./env.)	0.0%	\$ -
3. Mitigation (by design)	0.0%	\$ -
F. Noise		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -
G. Other		
1. Studies	0.0%	\$ -
2. Mitigation (by design)	0.0%	\$ -



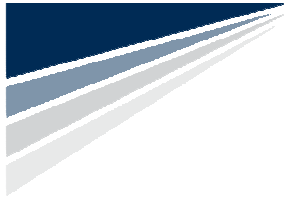
DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (WITH ROUNDABOUT)

PART 2 - Preliminary Engineering		
	Estimated % of Construction Cost (Appendix C, Item H)	
A. Surveys		
1. Inhouse	0.0%	\$ -
2. Consultant	1.0%	\$ 16,458
B. Design Engineering		
1. Design		
a. Inhouse	0.0%	\$ -
b. Consultant	10.0%	\$ 164,584
2. Traffic		
a. Inhouse	0.0%	\$ -
b. Consultant	1.0%	\$ 16,458
3. Real Estate Plan Preparation		
a. Inhouse	0.0%	\$ -
b. Consultant	1.0%	\$ 16,458
4. Utilities		
a. Inhouse	0.5%	\$ 8,229
b. Consultant	0.5%	\$ 8,229
c. Test Holes	0.25%	\$ 4,115
d. Utility Company	0.0%	\$ -
5. Materials and Research	Flat Cost	\$ 2,000
6. Borings	Flat Cost	\$ 5,000
7. Pile Test Loads	0.0%	\$ -
8. Subdivision		
a. Inhouse	0.0%	\$ -
b. Consultant	0.0%	\$ -
c. Railroad P.E.	0.0%	\$ -
9. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -
C. Environ. Assessment (Use for Class II Projects only)		
1. Wetlands	0.0%	\$ -
2. Hazardous Materials	0.0%	\$ -
3. Noise	0.0%	\$ -
4. Historic	0.0%	\$ -
5. Archaeology	0.0%	\$ -
6. Other		
a.	0.0%	\$ -
b.	0.0%	\$ -



Appendix B

Backup Calculations for Part III-Real Estate



DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (WITH ROUNDABOUT)

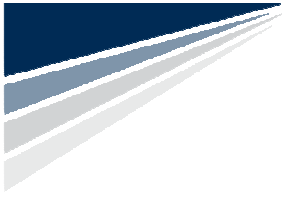
Zoning (In Henlopen Study Area)	Zoning Code	Fee Acquisition Cost/SF	Permanent Easement Acquisition Cost/SF
Agricultural Residential AR-1F Farmland	AR-1F	\$ 1.10	\$ 0.660
Agricultural Residential AR-1R Residential	AR-1R	\$ 5.74	\$ 3.450
Agricultural Residential AR-2R Residential	AR-2R	\$ 5.74	\$ 3.450
General Residential - GR	GR	\$ 5.74	\$ 3.450
Medium Residential	MR	\$ 5.74	\$ 3.450
Marine - M	M	\$ -	\$ -
Neighborhood Business - B-1	B-1	\$ -	\$ -
Neighborhood Business - B-2	B-2	\$ -	\$ -
General Commercial - C-1	C-1	\$ -	\$ -

Parcel Number	Zoning	Total Acquisition (Y/N)	Total Acquisition Cost (\$)	Fee Acquisition Area (SF)	Fee Acquisition Cost (\$)	PE Acquisition Area (SF)	Permanent Easement Acquisition Cost (\$)	Wetland Mitigation Area (SF)	Wetland Mitigation Area Cost (\$)
334-12.00-187.00	AR-1R	N		106.79	\$ 612.98	656.11	\$ 3,766.06		
334-12.00-125.00	AR-1R	N		4,645.16	\$ 26,663.23	3,063.39	\$ 17,583.84		
334-12.00-115.00	AR-1R	N		442.71	\$ 2,541.18	2,046.14	\$ 11,744.82		
334-12.00-116.00	AR-1R	N		3,219.80	\$ 18,481.65	20,183.51	\$ 115,853.34		
334-12.00-125.01	AR-1R	N		8,832.46	\$ 50,698.34	-	\$ -		
334-12.00-127.04	AR-1R	N		2,395.58	\$ 13,750.64	-	\$ -		
334-12.00-127.02	AR-1R	N		1,116.84	\$ 6,410.69	-	\$ -		
334-12.00-127.05	AR-1R	N		935.49	\$ 5,369.72	-	\$ -		
334-12.00-117.00	AR-1R	N		900.91	\$ 5,171.25	1,424.67	\$ 8,177.58		
334-12.00-118.00	AR-1R	N		1,777.49	\$ 10,202.82	1,654.07	\$ 9,494.37		
334-12.00-118.02	AR-1R	N		2,682.11	\$ 15,395.29	2,081.71	\$ 11,949.03		
334-12.00-118.01	AR-1R	N		3,006.04	\$ 17,254.66	2,119.71	\$ 12,167.12		
334-12.00-122.03	AR-1R	N		2,976.28	\$ 17,083.84	119.59	\$ 686.44		
334-12.00-119.00-1	AR-1R	N		3,049.92	\$ 17,506.52	-	\$ -		
334-12.00-124.01	AR-1R	N		-	\$ -	-	\$ -		
334-12.00-124.00	AR-1R	N		114.55	\$ 657.52	310.67	\$ 1,783.27		
334-12.00-122.00	AR-1R	N		4,304.08	\$ 24,705.43	-	\$ -		
334-12.00-121.01	AR-1R	N		5,675.88	\$ 32,579.56	-	\$ -		
334-13.00-263.00	AR-1R	N		2,496.90	\$ 14,332.20	80.08	\$ 459.65		
334-13.00-264.00	AR-1R	N		648.33	\$ 3,721.41	-	\$ -		
334-13.00-265.00	AR-1R	N		629.93	\$ 3,615.81	-	\$ -		
334-13.00-266.00	AR-1R	N		589.30	\$ 3,382.61	-	\$ -		
334-13.00-262.00	AR-1R	Y		8,802.79	\$ 330,000.00	-	\$ -		
334-12.00-178.00	AR-1R	N		8.29	\$ 47.58	679.67	\$ 3,901.28		
334-12.00-192.00	AR-1R	N		-	\$ -	-	\$ -		
334-12.00-191.00	AR-1R	N		-	\$ -	-	\$ -		
334-12.00-121.02	AR-1R	N		-	\$ -	-	\$ -		
334-12.00-121.00	AR-1R	N		-	\$ -	-	\$ -		
Total:			0	Total:	\$ 620,184.93	Total:	\$ 197,566.79	Total:	0

23

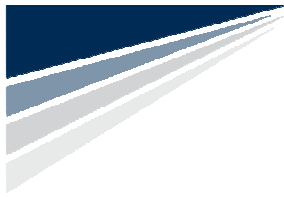
Appraisal Fees: \$ 23,000.00 Number of Parcels Impacted X \$1,000
 Staff: \$ 57,500.00 Number of Parcels Impacted X \$2,500
 Settlement: \$ 12,650.00 Number of Parcels Impacted X \$550

Additional area accounted for under Old Landing Road (segment #30)



Appendix C

Backup Calculations for Part IV - Construction



DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (WITH ROUNDABOUT)

General Roadway Data						
General Data		Roadway Box			Asphalt Unit Wt. (lb./CF)	
Length of Road Segment (LF)	3590.4	Type C Depth (in)	2		Type C	151.3
Existing Roadway Width (LF)	40	Type B Depth (in)	4		Type B	153.5
Proposed Roadway Width (LF)	40	BCBC Depth (in)	6		BCBC	151.5
Overlay Area (SF)	137027					
Widening Width (LF)	0	GABC Depth (in)	8		Project Duration (Assume 12 Mo/Mile)	
Widening/Reconstruction Area (SF)	73937	SUP Pavement Box				
Length of 10' Wide SUP (LF)	0	Type C Depth (in)	2		Duration (Month)	9
Area of 10' SUP (SF)	0	GABC Depth (in) (Typ 4")	8			
Length of 5' Wide Sidewalk (LF)	4466	SW Pavement Box				
Area of 5' Wide Sidewalk (SF)	22330	Concrete Depth (in) (Typ 4")	4			
Length of Curb/Gutter	898	GABC Depth (in) (Typ 4")	4			
Area of Triangular Concrete Islands	5188					
Length of Ditch Runs (LF)	6967					
Trapezoidal Ditch Cross-Sectional Area (including 6" Depth of topsoil) (SF)	11					

CELLS IN BLUE SHADE ARE AUTOMATED.
EDITING IS NOT REQUIRED.

Cost Derivation						
			%	QTY	Conceptual Unit Cost	Conceptual Cost
A.1.a: Grading						
202000	Excavation and Embankment					
	Roadway Box Excavation	CY	NA	2739	\$ 19.75	\$ 54,095.25
	SUP Excavation	CY	NA	0	\$ 19.75	\$ -
	Sidewalk Excavation	CY	NA	111	\$ 19.75	\$ 2,192.25
	Ditch Excavation	CY	NA	2839	\$ 19.75	\$ 56,070.25
	SWM Excavation (Say 5% of Excavation QTY)	CY	NA	300	\$ 19.75	\$ 5,925.00
Total:						\$ 118,282.75
A.1.b: Borrow						
	General Borrow (15%) of Excavation and Embankment (202000) QTY	CY	NA	899	\$ 15.75	\$ 14,159.25
A.2: Drainage						
	General Drainage of project cost	LS	4%	1	\$ 65,833.28	\$ 65,833.28
A.3.a: Pavement Surface						
401006	Superpave Type C, PG 70-22	Ton	NA	933	\$ 82.50	\$ 76,972.50
401015	Superpave Type B, PG 70-22	Ton	NA	1892	\$ 82.50	\$ 156,090.00
Total:						\$ 233,062.50
A.3.b: Pavement Base						
401021	Superpave Type BCBC, PG 64-22	Ton	NA	2801	\$ 75.00	\$ 210,075.00
762000	Sawcutting, Bituminous Concrete	LF	NA	7181	\$ 2.20	\$ 15,797.76
Total:						\$ 225,872.76
A.3.c: Pavement Subbase						
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 61.00	\$ -
A.4: Erosion/Sediment Control						
	General E&S (2.5%) of Overall Project Cost	LS	2.5%	1	\$ 41,145.80	\$ 41,145.80

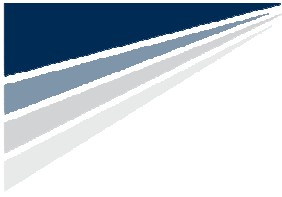
DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (WITH ROUNDABOUT)

A.5.a: Miscellaneous Curb/Gutter						
701016	I.P.C.C. Curb and Gutter, Type 1-4	LF	NA	898	\$ 25.50	\$ 22,899.00
702000	Triangular Channelizing Islands	SF	NA	5188	\$ 70.00	\$ 363,160.00
Total:						\$ 386,059.00
A.5.b: Miscellaneous Sidewalk						
705001	PCC Sidewalk, 4" (Item includes GABC)	SF	NA	22330	\$ 11.00	\$ 245,630.00
Total:						\$ 245,630.00
A.5.c: Guardrail						
720021	Galvanized Steel Beam Guardrail, Type 1-31	LF	NA	0	\$ -	\$ -
721000	Guardrail End Treatment, Type 1-31, Test Level 2	EACH	NA	0	\$ -	\$ -
Total:						\$ -
A.5.d: CPM Schedule						
763509	CPM Schedule Updates and/or Revised Updates	EAMO	NA	9	\$ 200.00	\$ 1,800.00
A.5.e: Clearing/Grubbing						
201000	Clearing And Grubbing (2.5%) of project cost	LS	2.5%	1	\$ 41,145.80	\$ 41,145.80
A.5.f: Field Office						
		EAMO	NA	9	\$ 2,500.00	\$ 22,500.00
A.5.g: Shared Use Path						
401006	Superpave Type C, PG 70-22	Ton	NA	0	\$ 82.50	\$ -
301001	Graded Aggregate Base Course, Type B	CY	NA	0	\$ 61.00	\$ -
Total:						\$ -
B.1: Structure Construction: New Bridge						
		LS	NA	0	\$ -	\$ -
B.2: Structure Construction: Old Structure Removal						
		LS	NA	0	\$ -	\$ -
B.3: Structure Construction: Retaining Wall						
		LS	NA	0	\$ -	\$ -
B.4: Structure Construction: Box Culvert						
		LS	NA	0	\$ -	\$ -
C.1: Landscaping Beautification						
908014	Permanent Grass Seeding, Dry Ground	SY	NA	11968	\$ 1.00	\$ 11,968.00
908004	Topsoil, 6" Depth	SY	NA	11968	\$ 6.00	\$ 71,808.00
Total:						\$ 83,776.00
C.2: Noise Mitigation						
			0%	1	\$ -	\$ -
C.3: Visual Mitigation						
			0%	1	\$ -	\$ -
C.4: Tree Mitigation (1%) of project cost						
			1%	1	\$ 16,458.32	\$ 16,458.32
D: Maintenance of Traffic						
801000	Maintenance of Traffic (2.5%) of project cost	LS	3%	1	\$ 41,145.80	\$ 41,145.80
	Detour Route (1%) of project cost	LS	1%	1	\$ 16,458.32	\$ 16,458.32
Total:						\$ 57,604.12
E.1.a: Signing Structures: Overhead Bridges						
		LS			\$ -	\$ -
E.1.b: Signing Structures: Cantilever Supports						
		LS			\$ -	\$ -



DELDOT PROJECT: T201769002 - HENLOPEN TID CTP COST DEVELOPMENT
SECTION 27: WARRINGTON ROAD (WITH ROUNDABOUT)

E.2: Roadway Lighting						
	Intersection Lighting	LS		1	\$ 50,000.00	\$ 50,000.00
E.3: Pavement Markings						
817013	Permanent Pavement Striping, Epoxy Resin Paint, White/Yellow, 5" Striping Symbols (Assume 20SF Per Symbol, \$8 per SF)	LF		21542	\$ 1.00	\$ 21,542.40
		Each		31	\$ 160.00	\$ 4,960.00
Total:						\$ 26,502.40
F: Wetland Mitigation		LS			\$ -	\$ -
G: Utility Relocation in Contract		LS			\$ -	\$ -
G.1: Water		LS			\$ -	\$ -
G.2: Sanitary Sewer		LS			\$ -	\$ -
G.3: Electric Pole Relocation		EA		8	\$ 2,000.00	\$ 16,000.00
H: Subtotal						\$ 1,645,831.98

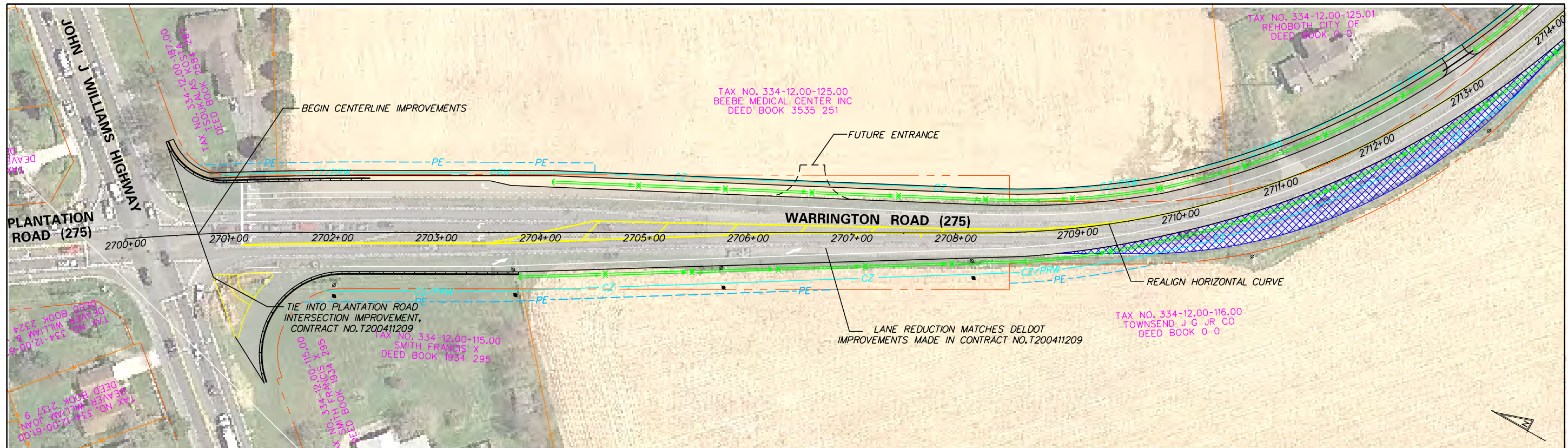
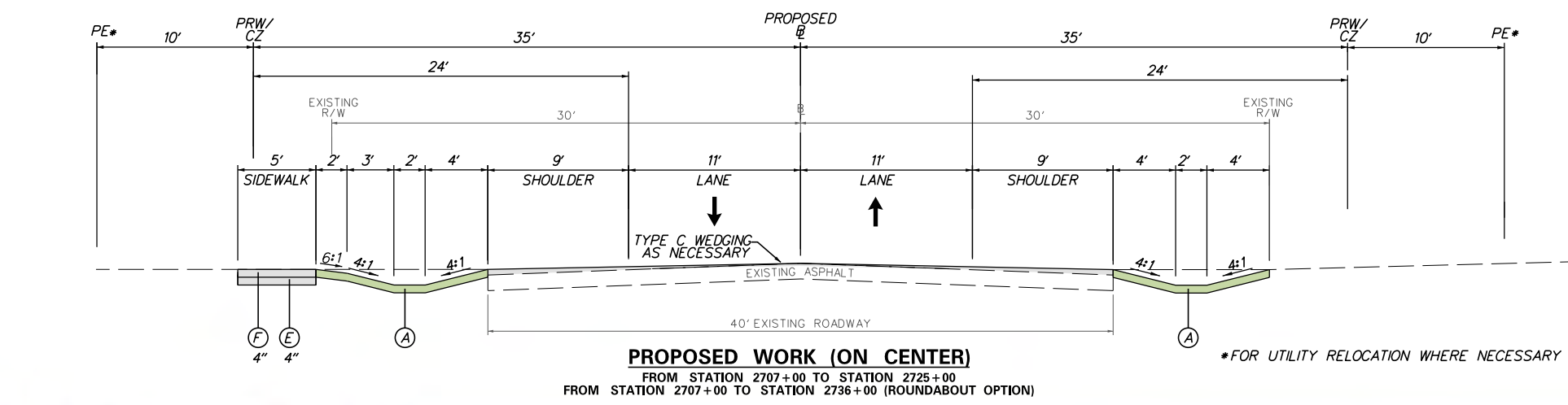
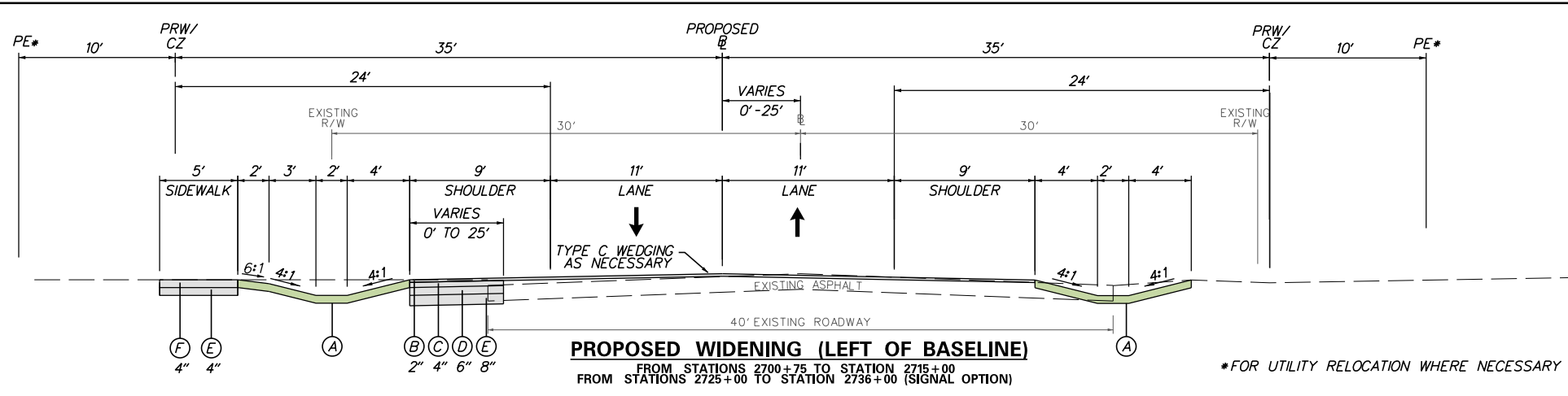


Appendix D Concept Plans

LEGEND

- PROPOSED PERMANENT EASEMENT - - - - - PE
- PROPOSED RIGHT-OF-WAY / CLEAR ZONE — — — — — CZ/PRW
- PROPOSED RIGHT-OF-WAY — — — — — R/W
- EXISTING RIGHT-OF-WAY - - - - -
- REQUIRED CLEAR ZONE — — — — — CZ
- PROPOSED UTILITY POLE ●
- EXISTING UTILITY POLE ∅
- PROPOSED FENCE ○ ○ ○ ○ ○
- PROPOSED LINEAR BMP — x — x — x — x —
- PROPOSED ROADWAY
- PROPOSED SHARED-USE PATH
- PROPOSED SIDEWALK
- PAVEMENT REMOVAL - TOPSOIL, SEED AND MULCH

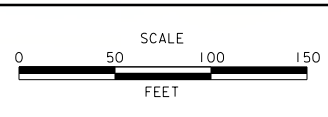
- (A) TOPSOIL, 6" DEPTH PERMANENT GRASS SEEDING, DRY GROUND
- (B) BITUMINOUS CONCRETE, SUPERPAVE TYPE C
- (C) BITUMINOUS CONCRETE, SUPERPAVE TYPE B
- (D) BITUMINOUS CONCRETE, SUPERPAVE BITUMINOUS CONCRETE BASE COURSE
- (E) GRADED AGGREGATE BASE COURSE, TYPE B
- (F) CONCRETE SIDEWALK



PLOTTED BY: LBERZINA DATE: 2/26/2019
 FILE LOCATION: Q:\160643_002_HENLOPEN_TID_CADD\27-WARRINGTON RD\CP.DGN [SHEET: CP01]



ADDENDUMS / REVISIONS	

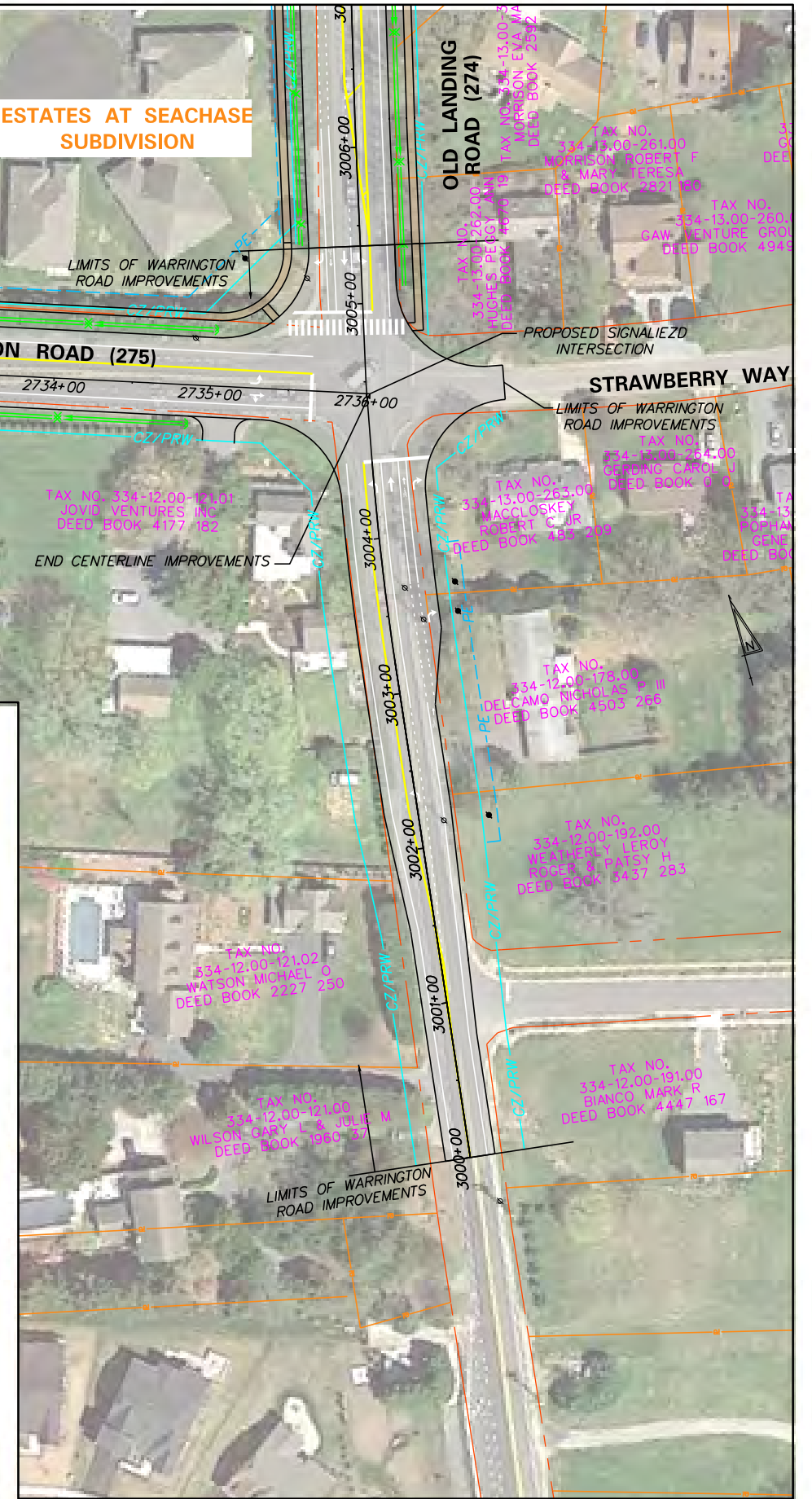
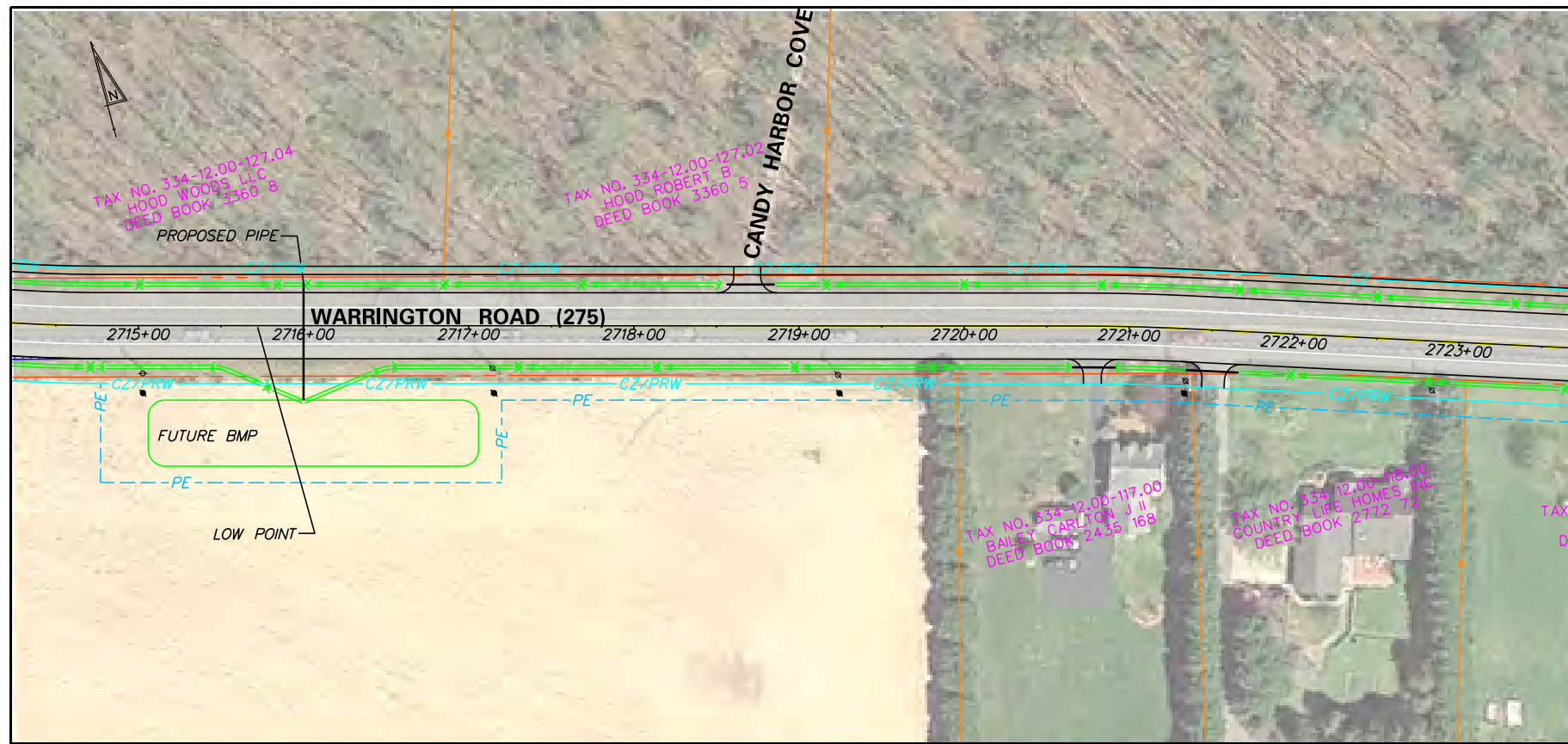
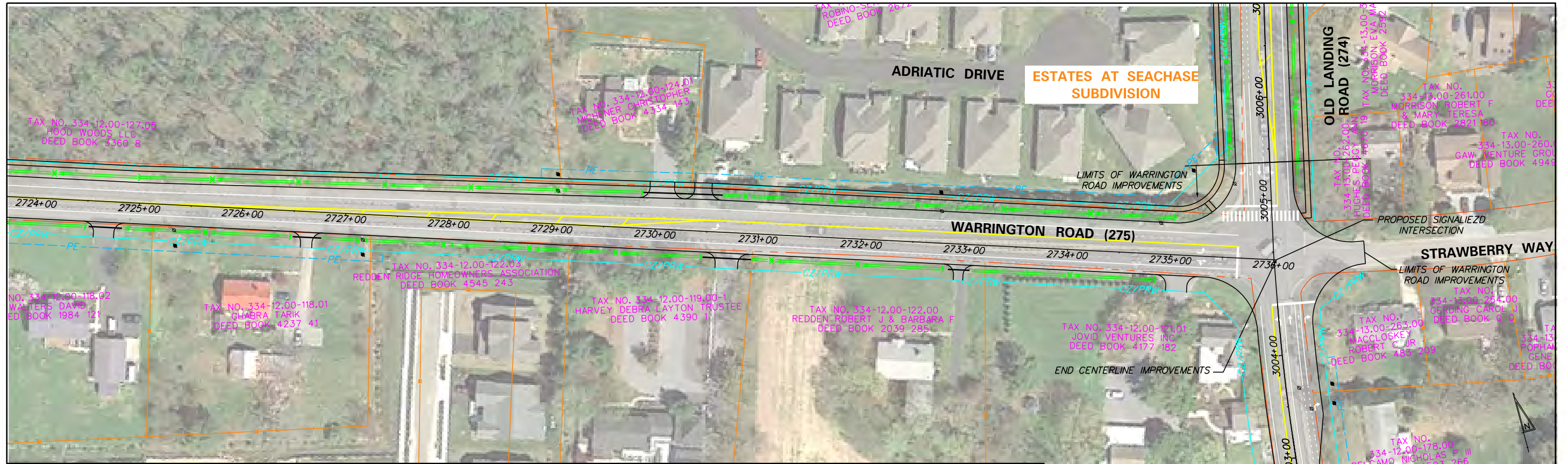


**HENLOPEN TID
 WARRINGTON ROAD
 (SEGMENT 27)**

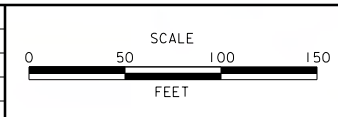
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T201769002	DESIGNED BY:	WJD
COUNTY	CHECKED BY:	BPH
NEW CASTLE		

CONCEPT PLAN	
SHEET NO.	1
TOTAL SHTS.	3

PLOTTED BY: LBERZINA DATE: 2/26/2019
 FILE LOCATION: Q:\2016\160643_002_HENLOPEN_TID_VCADD\27-WARRINGTON RD\CP.DGN [SHEET: CP01]



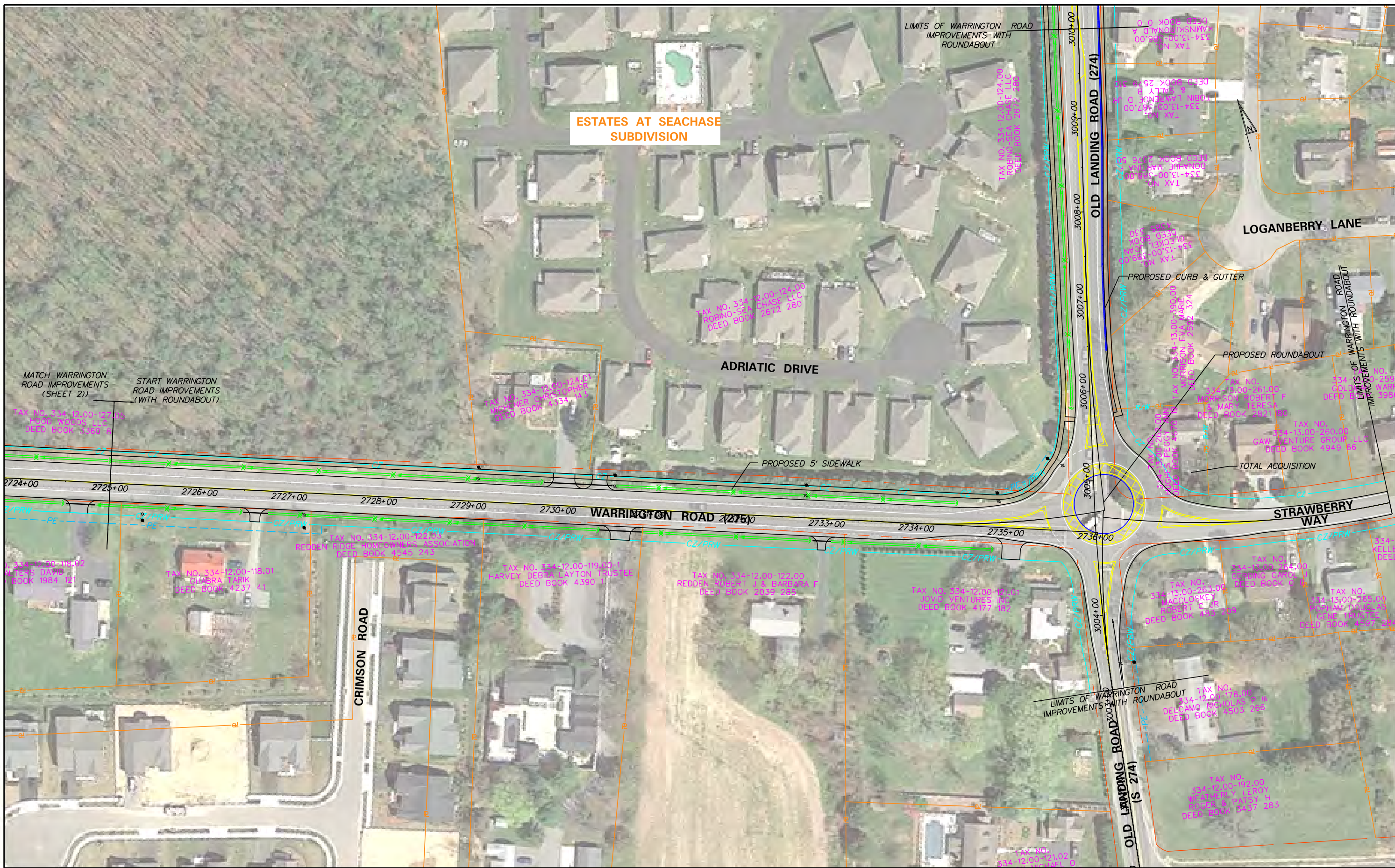
ADDENDUMS / REVISIONS	



**HENLOPEN TID
 WARRINGTON ROAD
 (SEGMENT 27)**

CONTRACT	BRIDGE NO.	NA
T201769002	DESIGNED BY: WJD	
COUNTY	CHECKED BY: BPH	
NEW CASTLE		

CONCEPT PLAN	SHEET NO.
	2
	TOTAL SHTS.
	3



**ESTATES AT SEACHASE
SUBDIVISION**

WARRINGTON ROAD

OLD LANDING ROAD (274)

ADRIATIC DRIVE

LOGANBERRY LANE

STRAWBERRY WAY

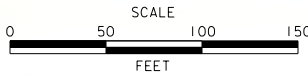
CRIMSON ROAD

OLD LANDING ROAD (S 274)

PLOTTED BY: LBERZINA DATE: 2/26/2019 FILE LOCATION: Q:\2016\160643_002_HENLOPEN_TID_VCADD_27-WARRINGTON_RD\CP.DGN [SHEET: CP01]



ADDENDUMS / REVISIONS	



**HENLOPEN TID
WARRINGTON ROAD
(SEGMENT 27)**

CONTRACT	BRIDGE NO.	NA
T201769002	DESIGNED BY: WJD	
COUNTY	CHECKED BY: BPH	
NEW CASTLE		

CONCEPT PLAN	
OPTION WITH ROUNDABOUT	

SHEET NO.	3
TOTAL SHTS.	3