


Submitted to:
City of Gahanna
March 2005



*Founders Ridge Drive & Lily Road Ct.
Intersection, Looking Southeast*

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104 Mill Street
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I. INTRODUCTION

The City of Gahanna authorized GGC Engineers Inc. to investigate the existing pavement problems on Founders Ridge Drive and Lily Pond Court. Founders Ridge Drive runs northeasterly between North Stygler Road and Ridenour Road. Lily Pond Court is a cul-de-sac which runs southeasterly off of Founders Ridge Drive (see Figure 1, Page 2 for Study Location Map).

II. METHOD OF STUDY

The City Engineer provided improvement plans of both roadways. A field, location and topographical survey to verify the improvement plans and grades was conducted. Preparation of typical sections with both existing and proposed conditions will be generated as well as various cost options for the proposed improvements.

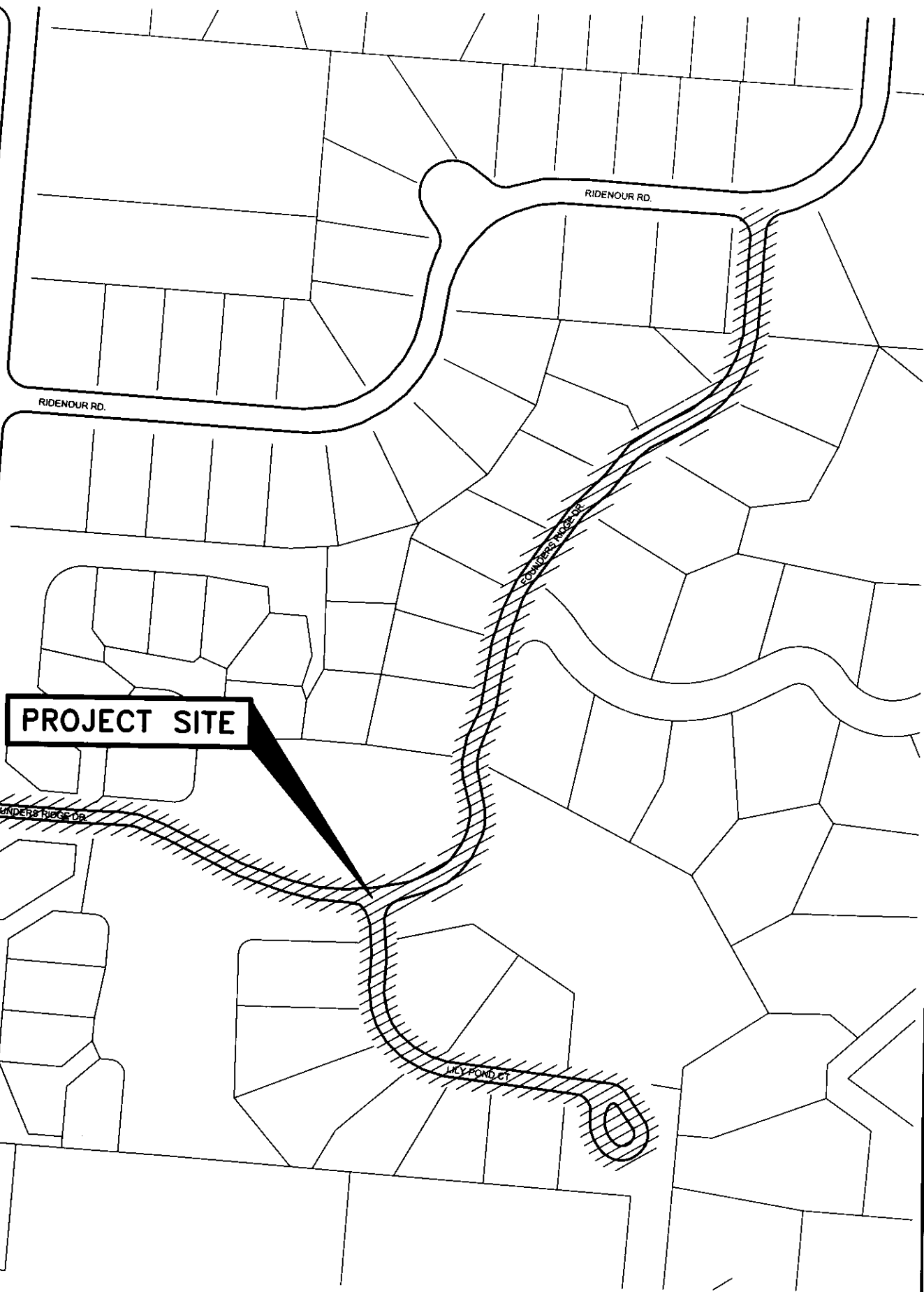
III. EXISTING CONDITIONS

The field and location survey verified that the inverted roadway crown that was shown on the improvement plans does exist. The inverted roadway crown allows for to existing pavement to drain from the curbs to the center of the pavement (see Figure 2, for existing typical section).

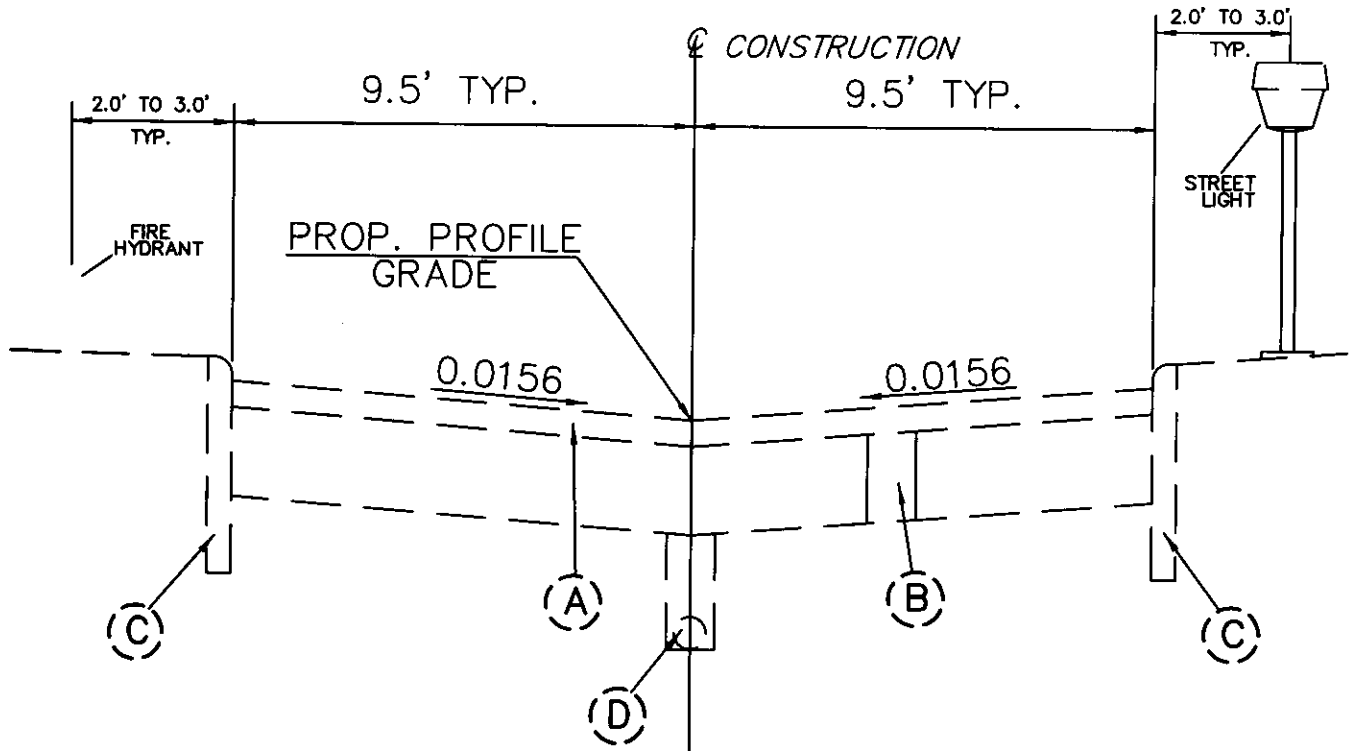
The field and location survey also showed that the pavement width averages 19 feet from face of curb to face of curb which means that the actual traveled lane in each direction is very narrow (9.5 feet) and substandard for local streets. Both the Institute of Transportation Engineers, Traffic Engineering Handbook, and the Ohio Department of Transportation, Location and Design Manual specify a minimum of 10 foot lane widths in each direction. The road follows a winding course and has much "On Street" parking which further exacerbates access problems.

Existing downspout and sump pump drains empty onto the pavement by pipes that are cut thru the existing curb line. Due to high groundwater conditions in the area, many of these sump pumps run several times a day year round. These drains add extra water onto the pavement that becomes hazardous in freezing conditions and has contributed to degradation of pavement in some areas.

There is a Storm Sewer System that collects the water in catch basins positioned along the center of the pavement and drains the water to various outlets. This situation allows water to collect on the pavement and then drain to the catch basins. This condition can contribute to deterioration of the pavement around the catch basins due to freezing and thawing conditions (see Appendix "A" pictures of existing deteriorated pavement and deteriorating areas around various catch basins).



PROJECT SITE



LEGEND

EXISTING

- (A) 2 1/2" ASPHALT CONCRETE
- (B) 7" CONCRETE BASE
- (C) ODOT TYPE 6 CURB
- (D) 4" PIPE UNDERDRAIN

IV. PROPOSED OPTIONS AND COSTS

Option Number 1

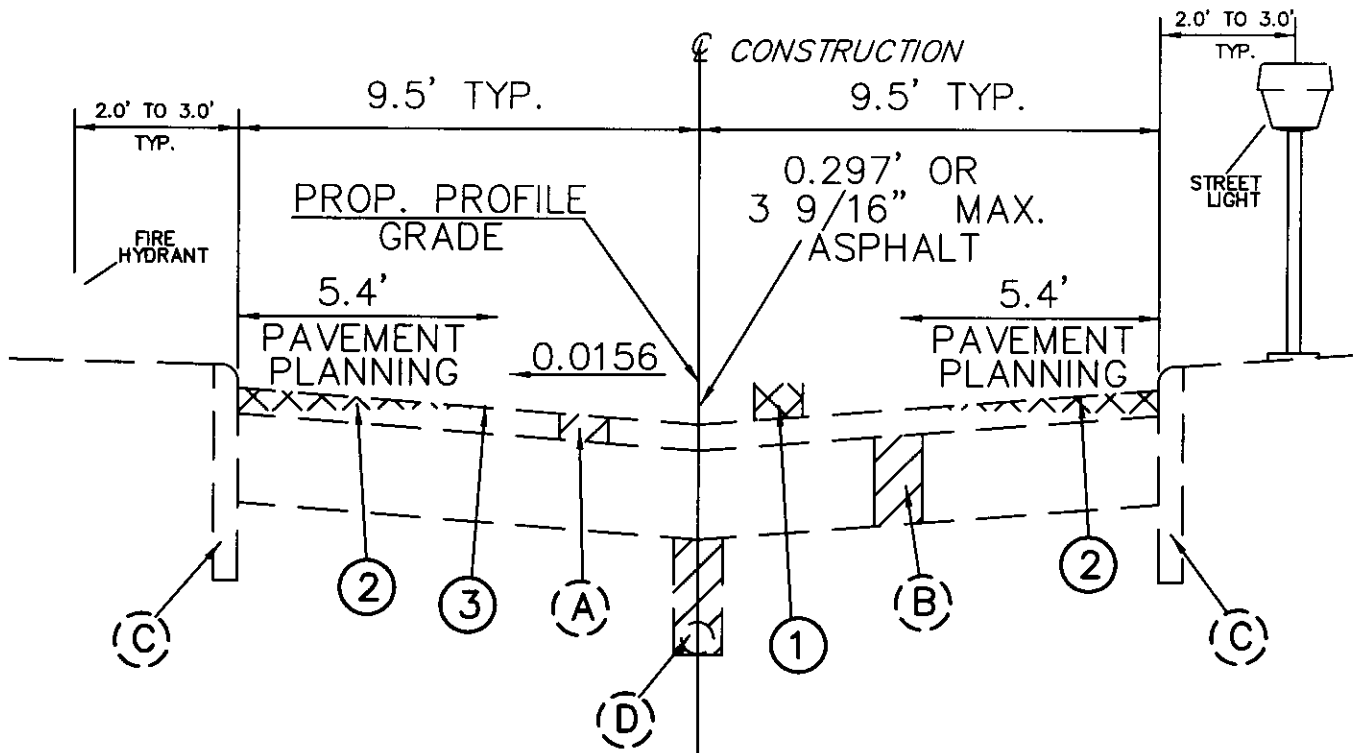
In order to help reduce the pavement deterioration in the middle of the roadway, it is proposed that the inverted roadway crown be replaced with a standard Ohio Department of Transportation (O.D.O.T.) pavement cross section, with a standard centerline crown and slope. This would involve planing 2 inches of the existing 2 1/2 inch asphalt overlay off of the existing pavement for a distance of 5.4 feet inward from the existing curb on each side of the pavement (see Figure 3 for the Option Number 1, Proposed Typical Section).

After Planing, new catch basins (20 each) would be installed along the existing curb at locations approximately perpendicular to the existing centerline, opposite the existing 10 catch basin locations. Next 12" crossover pipes would be installed from the proposed catch basin locations to the existing catch basins, which would be reconstructed into Manholes. The existing storm sewer system would then remain to function as it currently does.

Any pavement repair that is need would be performed prior to installing an asphalt surface course overlay. The asphalt overlay would consist of 2 inches of asphalt at the curbs, increasing to 3 9/16 inches at the center of the pavement. The result would be an O.D.O.T. standard pavement crown and slope (see Figure 3 for the Option Number 1, Proposed Typical Section).

The existing downspout drains still would empty onto the pavement thru the existing holes in the curb, but the new pavement crown would keep the water running along the existing curbs into the proposed catch basin locations. This configuration would help reduce hazardous pavement conditions during freezing temperatures.

The cost associated with the improvements outlined for Option Number 1, would have an estimated construction cost of Two Hundred Two Thousand Four Hundred Dollars (\$202,400). A cost breakdown for Option Number 1 is shown in Appendix "B", Page B-1.



LEGEND

EXISTING

- (A) 2 1/2" ASPHALT CONCRETE
- (B) 7" CONCRETE BASE
- (C) ODOT TYPE 6 CURB
- (D) 4" PIPE UNDERDRAIN

PROPOSED

- (1) ITEM 448 - 2" TO 3 9/16" ASPHALT CONCRETE, SURFACE COURSE, TYPE 1H
- (2) ITEM 254 - 2" TO 0" PAVEMENT PLANING BITUMINOUS
- (3) ITEM 407 - TACK COAT

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OPTION NUMBER 1
PROPOSED TYPICAL SECTION
FOUNDERS RIDGE DRIVE
AND LILY POND COURT

FIG. NO.:

3

PAGE NO.:

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Option Number 2

This option includes the new pavement crown, the new catch basins and the pavement overlay as outlined in Option Number 1 and includes several additional enhancements.

For Option 2, the downspout drains are to be cut short of the existing curbs and tied into a shallow 6 inch conduit. These conduits run behind the curbs at a depth of about 15 inches. The downspout drains are to be tied into this conduit which then drains along the back off the existing curbs into the catch basins that were installed as part of Option Number 1 (see Figure 4, Page 7 for the Option Number 2, Proposed Typical Section).

In addition to the 6 inch conduit, a 4 inch perforated, shallow pipe underdrain should be installed at a depth of about 18 inches below the existing 7 inch concrete base. This pipe will help keep underground water from working its way under the existing pavement and help extend the life of the pavement (see Figure 4 for the Option Number 2, Proposed Typical Section).

The cost associated with the improvements outlined for Option Number 2, would include all costs from Option Number 1, and have a possible construction cost of Three Hundred Thirty Four Thousand Four Hundred Dollars (\$334,400). A cost breakdown for Option Number 2 is shown in Appendix "B", Page B-2.

Option Number 2A

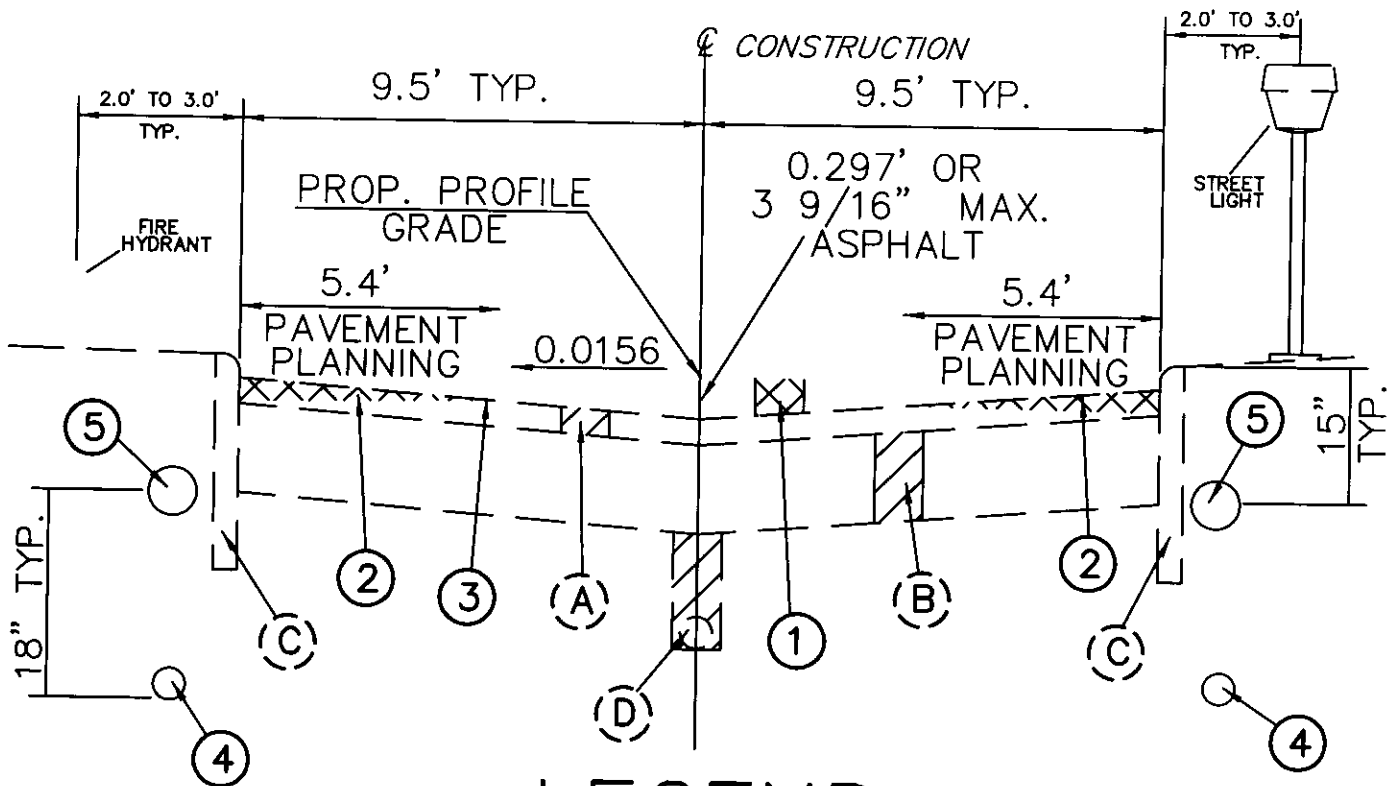
This Option is a combination of Options 1 and 2. The Option targets the largest problem areas along Founders Ridge Drive and installs an interceptor line (6 inch conduit) behind the curbs to connect the downspout and sump pump lines from the houses from Ridenour Road south the park area. This will remove substantial quantities of water from the surface of the road. These sump pumps were observed running at every site visit while compiling this report. The pavement by these outlets along Founders Ridge Drive has actually grown algae and mold along with contributing to pavement deterioration.

The cost associated with the improvements outlined for Option Number 2A, would include all costs from Option Number 1, and have a possible construction cost of Two Hundred Fifty Four Thousand One Hundred Dollars (\$254,100). A cost breakdown for Option Number 2A is shown in Appendix "B", Page B-2A.

Option Number 3

This option includes the new pavement crown, the new catch basins, the pavement overlay, the 6 inch conduit for draining the downspouts, and the 4" shallow pipe underdrain as outlined in Option Numbers 1 & 2. It also addresses the substandard pavement width as outlined under existing conditions on Page 1 of this study.

The existing O.D.O.T. Type 6 curbs, need to be removed and replaced with a combination curb and gutter 18 inches wide sitting on 6 inches of aggregate base (see Figure 5, for the



LEGEND

EXISTING

- (A) 2 1/2" ASPHALT CONCRETE
- (B) 7" CONCRETE BASE
- (C) ODOT TYPE 6 CURB
- (D) 4" PIPE UNDERDRAIN

PROPOSED

- (1) ITEM 448 - 2" TO 3 9/16" ASPHALT CONCRETE, SURFACE COURSE, TYPE 1H
- (2) ITEM 254 - 2" TO 0" PAVEMENT PLANING BITUMINOUS
- (3) ITEM 407 - TACK COAT
- (4) ITEM 605 4" SHALLOW PIPE UNDERDRAIN
- (5) ITEM 603 6" CONDUIT TYPE B

OPTION NUMBER 2
 PROPOSED TYPICAL SECTION
 FOUNDERS RIDGE DRIVE
 AND LILY POND COURT

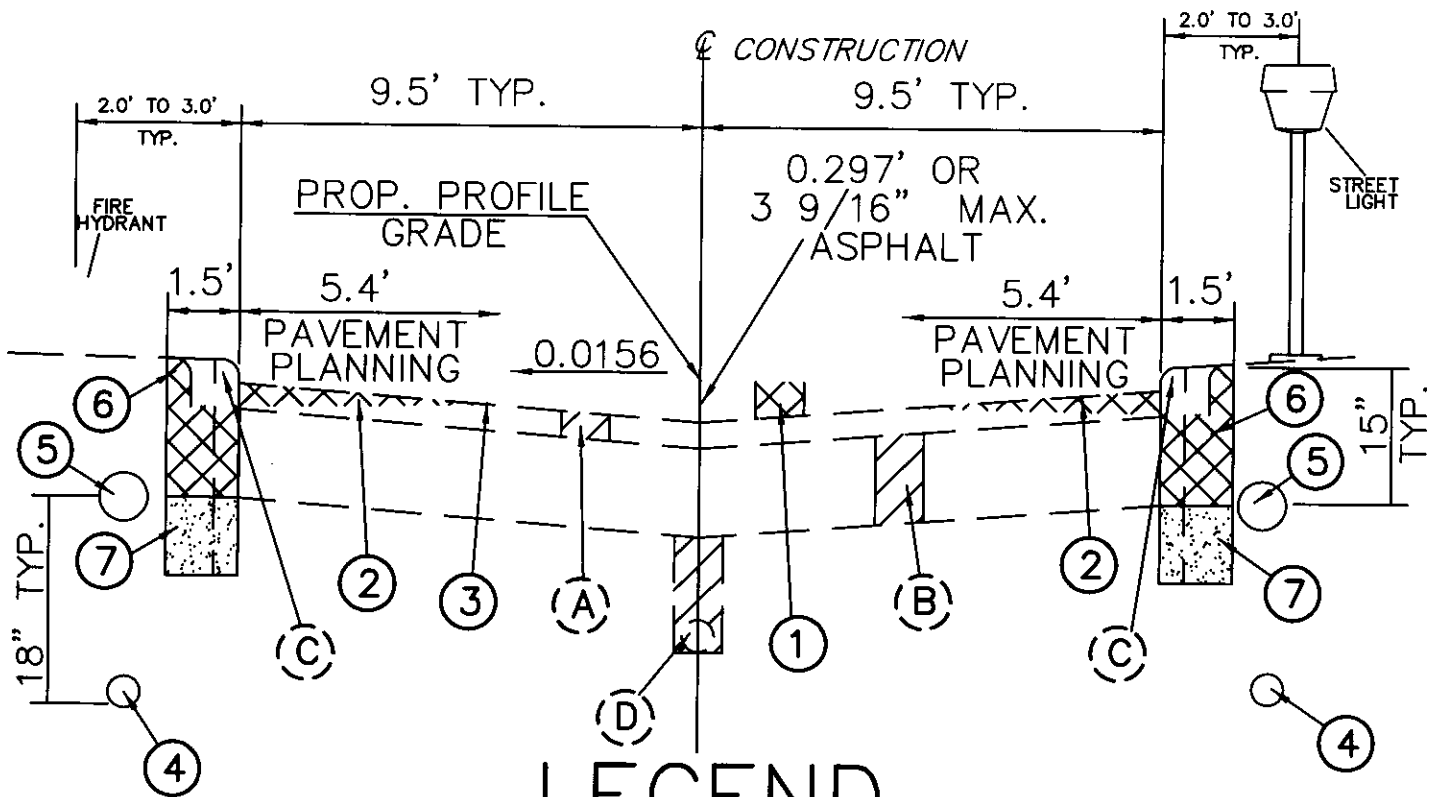
FIG. NO.:
4

PAGE NO.:
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LEGEND

EXISTING

- (A) 2 1/2" ASPHALT CONCRETE
- (B) 7" CONCRETE BASE
- (C) ODOT TYPE 6 CURB
- (D) 4" PIPE UNDERDRAIN

PROPOSED

- ① ITEM 448 - 2" TO 3 9/16" ASPHALT CONCRETE, SURFACE COURSE, TYPE 1H
- ② ITEM 254 - 2" TO 0" PAVEMENT PLANING BITUMINOUS
- ③ ITEM 407 - TACK COAT
- ④ ITEM 605 4" SHALLOW PIPE UNDERDRAIN
- ⑤ ITEM 603 6" CONDUIT TYPE B
- ⑥ ITEM 609 18" COMBINATION CURB AND GUTTER, TYPE 2-B
- ⑦ ITEM 304 6" AGGREGATE BASE

Option Number 3, Proposed Typical Section). The combination curb and gutter would be tied into the existing concrete base by the use of tie bars or hook bolts at 5 foot intervals. The combination curb and gutter would increase the existing lane widths from 9.5 feet to 10.5 feet for a total pavement width of 21 feet from face of curb to face of curb.

Existing waterline hydrants and street lights which are currently located within 2 to 3 feet of the existing face of curb, would need to be relocated to a minimum of 2 feet from the proposed face of curb.

Existing driveway aprons would also need to be removed and replaced to accommodate the new grades from the combination curb and gutter.

The cost associated with the improvements outlined for Option Number 3, would include all costs from Option Numbers 1 & 2, and have a possible construction cost of Five Hundred Thirty Nine Thousand Dollars (\$539,000). A cost breakdown for Option Number 3 is shown in Appendix "B", Page B-3.

V. CONCLUSION AND RECOMMENDATIONS

The existing storm sewer system primarily runs under the existing pavement. Prior to making any decision on the four options outlined above, the City should have the existing storm sewer system televised to determine any needed repairs that maybe required. Any additional costs for these repairs, would need to be added on the various Option costs.

The four outlined options in this study address the pavement deficiencies, the downspouts and the substandard pavement width as outlined under existing conditions on Page I of this study. The options are listed cost wise from lowest to highest, with Option Number 1 being the minimal work needed to bring the roadway up to an acceptable standard.

If the funds were available, our recommendation would be Option Number 3, as this would standardize the pavement width, eliminate the downspout runoff onto the pavement and establish a positive pavement crown. All of these items would help enhance the life the pavement.

In discussions with the City's personnel, Option 2A appears to be the most feasible with current budget constraints. This option address pavement deficiencies and drainage issues but does not address concerns with the pavements width.

**CITY OF GAHANNA
FOUNDERS RIDGE DRIVE
AND LILY POND COURT
PAVEMENT IMPROVEMENTS
OPTION NUMBER 1
ENGINEERS ESTIMATE OF PROBABLE COST**

Item No.	DESCRIPTION	Estimated Quantity	Units	Unit Cost	Total Cost
1	12" RCP (Storm Crossovers) Item 603	210	FT.	\$ 45.00	\$ 9,450.00
2	Catch Basin (3A w\ V-Grate) Item 604	20	Each	\$ 2,510.00	\$ 50,200.00
3	Catch Basin Reconstructed into Manhole w/ Core Drill for Connections, Item 604	10	Each	\$ 1,500.00	\$ 15,000.00
4	Pavement Base Repair Item 253	525	S.Y.	\$ 135.00	\$ 70,875.00
5	Pavement Planning Item 254	3,000	S.Y.	\$ 1.00	\$ 5,000.00
6	Tack Coat Item 407	525	Gallons	\$ 0.80	\$ 420.00
7	2" to 3 9/16" Asphalt Concrete Surface Course Type 1H Item 448	340	C.Y.	\$ 85.00	\$ 28,900.00
8	Maintaining Traffic Item 614	1	Lump Sum	\$ 4,000.00	\$ 4,000.00

Subtotal of Possible Construction Cost =	\$ 184,000.00
10% Contingency's =	<u>\$ 18,400.00</u>
Possible Construction Cost =	\$ 202,400.00

**CITY OF GAHANNA
FOUNDERS RIDGE DRIVE
AND LILY POND COURT
PAVEMENT IMPROVEMENTS
OPTION NUMBER 2
ENGINEERS ESTIMATE OF PROBABLE COST**

Item No.	DESCRIPTION	Estimated Quantity	Units	Unit Cost	Total Cost
1	Excavation Item 203	370	C.Y.	\$ 5.00	\$ 1,850.00
2	6" Conduit Type B Item 603	3,300	FT.	\$ 25.00	\$ 82,500.00
3	12" RCP (Storm Crossovers) Item 603	210	FT.	\$ 45.00	\$ 9,450.00
4	Catch Basin (3A w/ V-Grate) Item 604	20	Each	\$ 2,510.00	\$ 50,200.00
5	Catch Basin Reconstructed into Manhole w/ Core Drill for Connections, Item 604	10	Each	\$ 1,500.00	\$ 15,000.00
6	4" Shallow Pipe Underdrain Item 605	5,000	FT.	\$ 4.50	\$ 22,500.00
7	Pavement Base Repair Item 253	525	S.Y.	\$ 135.00	\$ 70,875.00
8	Pavement Planning Item 254	3,000	S.Y.	\$ 1.00	\$ 5,000.00
9	Tack Coat Item 407	525	Gallons	\$ 0.80	\$ 420.00
10	2" to 3 9/16" Asphalt Concrete Surface Course Type 1H Item 448	340	C.Y.	\$ 85.00	\$ 28,900.00
11	Seeding and Mulching Item 659	2,800	S.Y.	\$ 2.00	\$ 5,600.00
12	Driveway Replacement, Item 452	1000	S.F.	\$ 6.00	\$ 6,000.00
13	Maintaining Traffic Item 614	1	Lump Sum	\$ 6,000.00	\$ 6,000.00

Subtotal of Possible Construction Cost =	\$ 304,000.00
10% Contingency's =	\$ 30,400.00
Possible Construction Cost =	\$ 334,400.00

**CITY OF GAHANNA
FOUNDERS RIDGE DRIVE
AND LILY POND COURT
PAVEMENT IMPROVEMENTS
OPTION NUMBER 2A
ENGINEERS ESTIMATE OF PROBABLE COST**

Item No.	DESCRIPTION	Estimated Quantity	Units	Unit Cost	Total Cost
1	Excavation Item 203	370	C.Y.	\$ 5.00	\$ 1,850.00
2	6" Conduit Type B Item 603	1,500	FT.	\$ 25.00	\$ 37,500.00
3	12" RCP (Storm Crossovers) Item 603	210	FT.	\$ 45.00	\$ 9,450.00
4	Catch Basin (3A w/ V-Grate) Item 604	20	Each	\$ 2,510.00	\$ 50,200.00
5	Catch Basin Reconstructed into Manhole w/ Core Drill for Connections, Item 604	10	Each	\$ 1,500.00	\$ 15,000.00
6	Driveway Replacement, Item 452	540	S.F.	\$ 6.00	\$ 3,240.00
7	Pavement Base Repair Item 253	525	S.Y.	\$ 135.00	\$ 70,875.00
8	Pavement Planning Item 254	3,000	S.Y.	\$ 1.00	\$ 5,000.00
9	Tack Coat Item 407	525	Gallons	\$ 0.80	\$ 420.00
10	2" to 3 9/16" Asphalt Concrete Surface Course Type 1H Item 448	340	C.Y.	\$ 85.00	\$ 28,900.00
11	Seeding and Mulching Item 659	1,500	S.Y.	\$ 2.00	\$ 3,000.00
12	Maintaining Traffic Item 614	1	Lump Sum	\$ 6,000.00	\$ 6,000.00

Subtotal of Possible Construction Cost =	\$ 231,000.00
10% Contingency's =	\$ 23,100.00
Possible Construction Cost =	\$ 254,100.00

**CITY OF GAHANNA
FOUNDERS RIDGE DRIVE
AND LILY POND COURT
PAVEMENT IMPROVEMENTS
OPTION NUMBER 3
ENGINEERS ESTIMATE OF PROBABLE COST**

Item No.	DESCRIPTION	Estimated Quantity	Units	Unit Cost	Total Cost
1	Driveway Aprons Removed Item 202	850	S.Y.	\$ 5.00	\$ 4,250.00
2	Curb Removed Item 202	5,000	FT.	\$ 4.00	\$ 20,000.00
3	Excavation Item 203	370	C.Y.	\$ 5.00	\$ 1,850.00
4	6" Conduit Type B Item 603	3,300	FT.	\$ 25.00	\$ 82,500.00
4	12" RCP (Storm Crossovers) Item 603	210	FT.	\$ 45.00	\$ 9,450.00
5	Catch Basin (3A w/ V-Grate) Item 604	20	Each	\$ 2,510.00	\$ 50,200.00
6	Catch Basin Reconstructed into Manhole Item 604	10	Each	\$ 1,500.00	\$ 15,000.00
7	4" Shallow Pipe Underdrain Item 605	5,000	FT.	\$ 4.50	\$ 22,500.00
8	Pavement Base Repair Item 253	525	S.Y.	\$ 135.00	\$ 70,875.00
9	Pavement Planning Item 254	3,000	S.Y.	\$ 1.00	\$ 5,000.00
10	6" Aggregate Base Item 304	140	C.Y.	\$ 35.00	\$ 4,900.00
11	Tack Coat Item 407	580	Gallons	\$ 0.80	\$ 464.00
12	2" to 3 9/16" Asphalt Concrete Surface Course Type 1H Item 448	360	C.Y.	\$ 85.00	\$ 30,600.00
13	Driveway Apron Concrete Item 451	760	S.Y.	\$ 45.00	\$ 34,200.00
13	Combination Curb and Gutter Type 2-B, Item 609	5,000	FT.	\$ 16.00	\$ 80,000.00
14	Street Lights Relocated Item 632	14	Each	\$ 1,300.00	\$ 18,200.00
15	Hydrant Relocated Item 638	7	Each	\$ 1,200.00	\$ 8,400.00
16	Seeding and Mulching Item 659	7,680	S.Y.	\$ 2.00	\$ 15,360.00
17	Driveway Replacement, Item 452	1000	S.F.	\$ 6.00	\$ 6,000.00
18	Maintaining Traffic Item 614	1	Lump Sum	\$ 10,000.00	\$ 10,000.00

Subtotal of Possible Construction Cost =	\$ 490,000.00
10% Contingency's =	\$ 49,000.00
Possible Construction Cost =	\$ 539,000.00