

MILLCREEK TOWNSHIP
LEBANON COUNTY, PENNSYLVANIA
ORDINANCE NO. 110911A

IMPOSING RESTRICTIONS ON THE WEIGHT OF VEHICLES OPERATED UPON BETHANY ROAD (T-361) BETWEEN MEMORIAL BOULEVARD (T-365) AND THE BOUNDARY BETWEEN MILLCREEK TOWNSHIP AND BERKS COUNTY, PENNSYLVANIA; PROVIDING FOR THE ISSUANCE OF PERMITS AND THE POSTING OF SECURITY FOR THE MOVEMENT OF VEHICLES OF A WEIGHT IN EXCESS OF THOSE RESTRICTIONS THAT MEET THE DEFINITION OF LOCAL TRAFFIC; AND PRESCRIBING PENALTIES FOR VIOLATIONS.

BE IT ORDAINED AND ENACTED, and it is hereby ordained and enacted by the Board of Supervisors of Millcreek Township, Lebanon County, Pennsylvania, as follows:

SECTION 1: SHORT TITLE

This Ordinance shall be known as "Bethany Road Motor Vehicle Weight Limitation Ordinance of Millcreek Township."

Emergency Vehicle - a fire department vehicle, police vehicle, ambulance, blood delivery vehicle, Armed Forces emergency vehicle, one private vehicle of a fire or police chief or assistant chief, or ambulance corps commander or assistant commander, or of a river rescue commander used for answering emergency calls, or other vehicle designated by the State Police under Section 6101 of the Vehicle Code (relating to designation of emergency vehicles by Pennsylvania State Police).

School Bus - a motor vehicle designated for carrying more than ten (10) passengers, exclusive of the driver, and used for the transportation of school children.

SECTION 4: FINDINGS OF THE BOARD OF SUPERVISORS OF MILLCREEK TOWNSHIP

The Board of Supervisors has determined and hereby determines, based upon weight limit studies performed by Herbert, Rowland & Grubic, Inc., a copy of which is attached to this Ordinance as Exhibit A, that Bethany Road (T-361) between Memorial Boulevard (T-365) and the boundary line between Millcreek Township and Berks County may be damaged or destroyed unless the permissible weight of motor vehicles is restricted to the weight limits set forth in those studies.

SECTION 5: VEHICLE WEIGHT LIMITS ESTABLISHED

(A) Pursuant to the findings in Section 4, above, and by authority of Section 4902 of the Vehicle Code and regulations promulgated thereunder, no motor vehicle or combination shall be operated upon Bethany Road (T-361) between Memorial Boulevard (T-365) and the boundary line between Millcreek Township and Berks County with gross weight in excess of the weight limits recommended in the Bethany Road Weight Restriction Study dated October 6, 2011, prepared by Herbert, Rowland & Grubic, Inc., a copy of which is attached to this Ordinance as Exhibit A.

(B) Local traffic as defined in Section 3, above, shall be exempt from the restrictions imposed under subsection (A) above; provided, however, that if the Board of Supervisors determines that any local traffic is likely to damage the road, the Board of Supervisors will notify the registrants of the motor vehicle or combination and the Pennsylvania State Police of that determination. After two (2) business days following delivery of those notices, or after five (5) days following mailing of those notices, such local traffic vehicles shall not exceed the weight limits except in accordance with Section 6 hereof.

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SECTION 6: PERMITS AND SECURITY

The Board of Supervisors of Millcreek Township may issue permits for the movement of motor vehicles or combinations with weights in excess of the restrictions imposed under Section 5, above, that meet the definition of local traffic as defined in Section 3, above, and may require such undertaking or security as it deems necessary to cover the costs of anticipated or probable repairs and restoration necessitated by the permitted movement of such vehicles.

All actions taken under the authority of this section shall be taken in accordance with the rules and regulations adopted by the Commonwealth of Pennsylvania, Department of Transportation, as found in Title 67 of the Pennsylvania Code.

SECTION 7: ERECTION OF SIGNS

The Township shall erect, or cause to be erected, and maintained restriction signs designating the restrictions at the end of the portion of road restricted as provided in this Ordinance. In the case of a restriction on a road that has not begun or ended at an intersection with an unrestricted highway, the Township shall also place an advance informational sign at the intersection nearest each end of the restricted portion of the road that will allow drivers to avoid the restricted portion of road. These signs shall be erected and maintained in accordance with the rules and

regulations adopted by the Commonwealth of Pennsylvania, Department of Transportation, as found in Title 67 of the Pennsylvania Code.

SECTION 8: AUTHORITY TO ADOPT FORMS AND FEES BY RESOLUTION

The Board of Supervisors shall have the authority from time to time to adopt by resolution: (i) forms to be used for the application for and issuance of permits under this ordinance; (ii) a schedule of fees to be paid by permittees for the processing and issuance of permits under this ordinance; and (iii) a schedule of fees to be paid by permittees for inspections of highways subject to this ordinance.

SECTION 9: PENALTIES FOR VIOLATION

Pursuant to Section 4902(g)(1) of the Vehicle Code (75 Pa. C.S. Section 4902(g)(1), any person operating a vehicle or combination upon a highway or bridge in violation of a prohibition or restriction imposed under Section 5, above, is guilty of a summary offense and shall, upon conviction, be sentenced to pay a fine of \$75, except that any person convicted of operating a vehicle with a gross weight in excess of a posted weight shall, upon conviction, be sentenced to pay a fine of \$150 plus \$150 for each 500 pounds, or part thereof, in excess of 3,000 pounds over the maximum allowable weight.

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SECTION 10: REPEALS

All other ordinances or parts of ordinances inconsistent with this Ordinance are hereby repealed insofar as they may be inconsistent herewith.

SECTION 11: SEVERABILITY


The provisions of this Ordinance are severable. If any sentence, clause, or section of this Ordinance is for any reason found to be unconstitutional, illegal, or invalid, such unconstitutionality, illegality, or invalidity shall not affect or impair any of the remaining provisions, sentences, clauses, or sections of this Ordinance. It is hereby declared to be the intent of the Board of Supervisors of Millcreek Township that this Ordinance would have been enacted had such unconstitutional, illegal, or invalid sentence, clause or section not been included.


SECTION 12:

This Ordinance shall become effective five (5) days after enactment.

DULY ENACTED AND ORDAINED on this 9th day of November,
2011, by the Board of Supervisors of the Township of Millcreek, Lebanon County,
Pennsylvania.

BOARD OF SUPERVISORS
MILLCREEK TOWNSHIP
LEBANON COUNTY, PENNSYLVANIA


Chairman

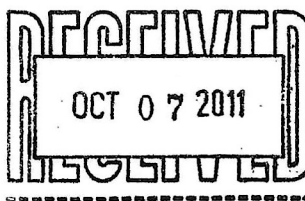

Supervisor


Supervisor

ATTEST:


Secretary

608814



October 6, 2011

Donald R. Leibig
Millcreek Township
81 East Alumni Avenue
Newmanstown, Pennsylvania 17073

Re: Engineering Services
Bethany Road Weight Restriction Study

Dear Mr. Leibig:

Herbert, Rowland & Grubic, Inc. (HRG) is pleased to submit the following weight restriction study.

BACKGROUND

Millcreek Township is considering a truck restriction on Bethany Road between Memorial Boulevard and the municipal boundary in order to protect Bethany Road from overweight vehicles. The Township has requested engineering assistance with a weight restriction study required per State regulations.

WEIGHT RESTRICTION STUDY PARAMETERS

The weight restriction study has been conducted in accordance with PennDOT Publication 212 Section 117. PennDOT Publication 212 Section 117 (b) indicates that "traffic on a highway may be prohibited or restricted by weight of a vehicle, or kinds or classes of vehicles when warranted by an engineering evaluation [which] may be based on structural analysis, testing, engineering judgment or a combination thereof." PennDOT Publication 212 Section 117 (b) (1) indicates that the restriction is warranted if "the highway pavement or shoulders have inadequate structural capacity or have been weakened due to deterioration, high traffic volumes or climatic condition, and may be seriously damaged unless a restriction is imposed."

Based on the above PennDOT standards, this study includes an investigation of traffic conditions (including traffic volumes and heavy vehicles) and an inventory / analysis of existing roadway pavement conditions (including a field review, laboratory testing, and an engineering analysis).

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EXISTING ROADWAY CHARACTERISTICS

General Roadway Description

Bethany Road is a local road located in a rural area southeast of Newmanstown. The roadway segment included in this study connects Memorial Boulevard to the Millcreek municipal boundary with Berks County. Bethany Road consists of two approximately 10-foot lanes with no shoulders. Pavement markings consist of a single yellow centerline. The surrounding land uses are agricultural, wooded, and residential.

Traffic Volumes and Heavy Vehicles

Bethany Road has an Average Daily Traffic (ADT) volume of 883 vehicles per day with 6% heavy vehicles. The overwhelming majority of the heavy vehicles are Class 5 (2 Axle 6 Tire Trucks). The remaining heavy vehicles are Class 4 (Buses) and Class 8 (<5 Axle Doubles). This information is based on an Automated Traffic Recorder (ATR) count conducted on Tuesday, September 20, 2011. The ATR results are attached.

EXISTING PAVEMENT CONDITIONS

Field Review

The existing pavement shows varying degrees of fatigue cracking along substantial portions of the study segment. Fatigue cracking is indicative of a structural problem. The existing pavement also shows low and medium degrees of edge deterioration along various locations of the study segment. Edge deterioration is also indicative of a structural problem. There is also evidence of raveling / weathering including several small potholes. This type of pavement condition is caused by oxidation and exacerbated by the impact of vehicular loadings. Bituminous patching is also present at several spots along the study segment. Photographs of existing pavement conditions are attached.

Geotechnical Testing

Three pavement cores were extracted from Bethany Road; one adjacent to Memorial Boulevard, one adjacent to the municipal boundary, and one between these two locations. The pavement cores consisted of three courses of pavement with overall thicknesses of 4¾", 5½", and 6½". One California Bearing Ratio (CBR) subgrade soil test was completed. The soil tested was a dark grayish brown silty sand with some gravel and trace organics. The observed CBR value was 9.7. The geotechnical field observations and laboratory test results are attached.

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Engineering Analysis

Based on the existing traffic volumes, vehicle classifications, and observed pavement structure, a pavement analysis was completed in order to determine the adequacy of the existing pavement. The analysis was completed based on AASHTO pavement design using the DARWin Pavement Design and Analysis System (DARWin). Based on these analyses, the existing pavement has an effective structural number of 1.42 and the structural number necessary for future traffic is 1.69. The existing pavement is deficient based on this analysis. The DARWin analyses are attached.

Subsequent DARWin analyses were performed in order to analyze the adequacy of the existing pavement with various weight restrictions. The ATR data indicated that there were 1% Class 4 vehicles (Buses), 4% Class 5 vehicles (2 Axle 6 Tire Trucks), and <1% Class 8 vehicles (<5 Axle Doubles). The following restrictions were analyzed:

1. Restriction of Class 8 Vehicles and Greater - A DARWin analysis without the Class 8 vehicles (<5 Axle Doubles) was completed. This analysis indicated a structural number necessary for future traffic of 1.64. Since this number is higher than the effective structural number of the existing pavement (1.42), the existing pavement would still be deficient with a restriction of the Class 8 vehicles.
2. Restriction of Class 5 Vehicles and Greater (all trucks) - A DARWin analysis without the Class 5 vehicles (2 Axle 6 Tire Trucks) and without the Class 8 vehicles (<5 Axle Doubles) was completed. This analysis indicated a structural number necessary for future traffic of 1.27. Since this number is less than the effective structural number of the existing pavement (1.42), the existing pavement would be adequate with the restriction of the Class 5 vehicles and greater. This would still allow buses (Class 4 vehicles) to travel along Bethany Road.

CONCLUSIONS AND RECOMMENDATIONS

PennDOT Publication 212 Section 117 (b) (1) indicates that "traffic on a highway may be prohibited or restricted by weight of a vehicle, or kinds or classes of vehicles when warranted by an engineering evaluation [which] may be based on structural analysis, testing, engineering judgment or a combination thereof." The field view of the existing pavement showed two structural issues: fatigue cracking and edge deterioration. The pavement also showed signs of weathering / raveling which is exacerbated by vehicular loadings. Additionally, the ATR data indicated that a substantial amount of trucks utilize the study segment. Based on the existing pavement conditions and the ATR data, a weight restriction is justified along this segment of Bethany Road. Additionally, DARWin analyses indicate that the existing pavement structure is deficient and that all trucks Class 5 and greater must be restricted in order to protect the existing pavement. A weight restriction is further justified based on the DARWin analyses.

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In order to restrict Class 5 vehicles and greater, a general truck restriction is recommended. "No Truck" signs, R5-2, should be provided (see attached). This restriction would still permit buses to travel along Bethany Road. The truck restriction should be posted for eastbound traffic with signs at the intersection of Memorial Boulevard and Bethany Road. However, westbound traffic requires advance signing within Heidelberg Township, Lebanon County. Further coordination between Millcreek Township and Heidelberg Township will be necessary to determine proper signing locations.

If you have any questions, please feel free to contact me to discuss them in greater detail.

Sincerely,

Herbert, Rowland & Grubic, Inc.


Eric J. Stump, P.E., PTOE
Regional Traffic Manager

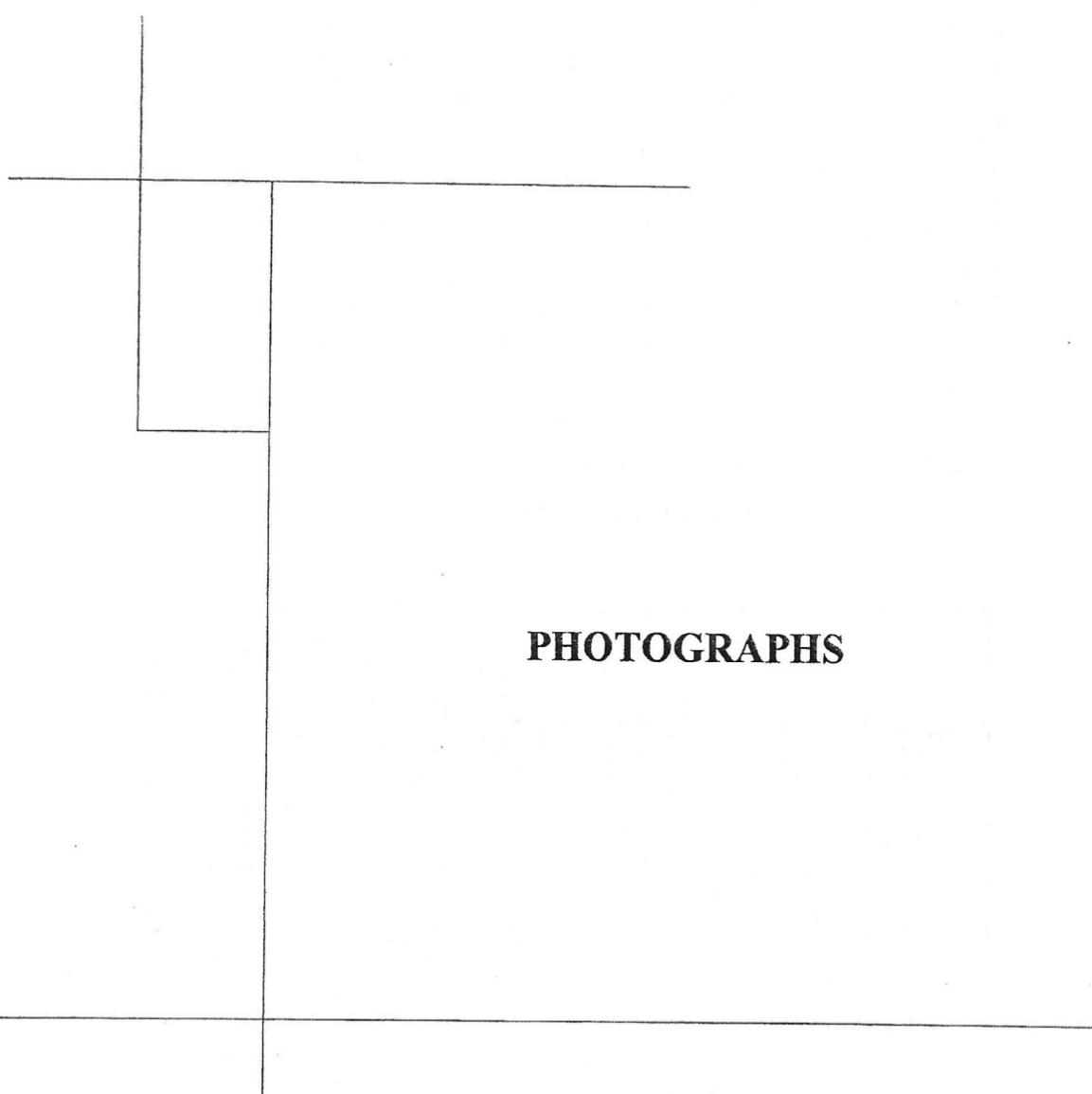
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Enclosures

c: Albert T. Brulo, P.E., Senior Vice President, HRG

Herbert, Rowland & Grubic, Inc.

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PHOTOGRAPHS



Fatigue Cracking – Medium Severity



Edge Deterioration – Low Severtiy

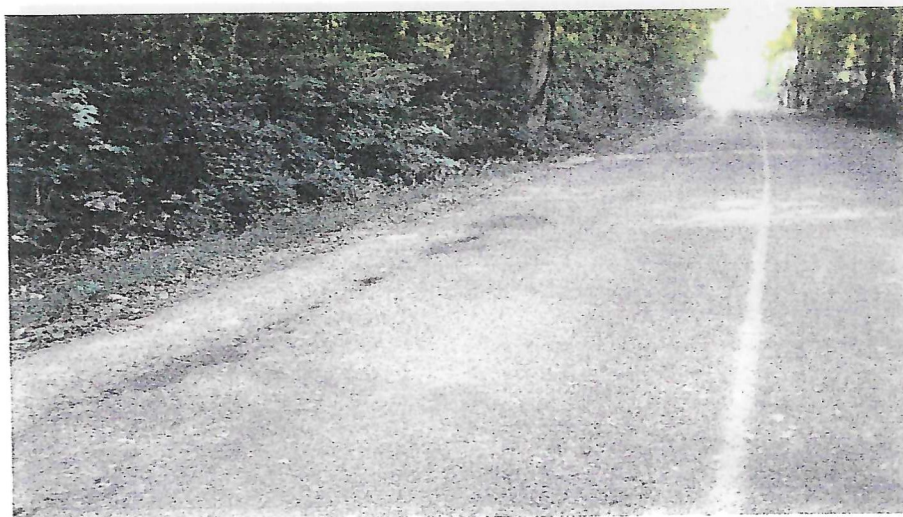
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Edge Deterioration – Low-Severity



Edge Deterioration – Low Severity



Fatigue Cracking – Medium Severity



Fatigue Cracking – Medium Severity



Fatigue Cracking — Medium Severity



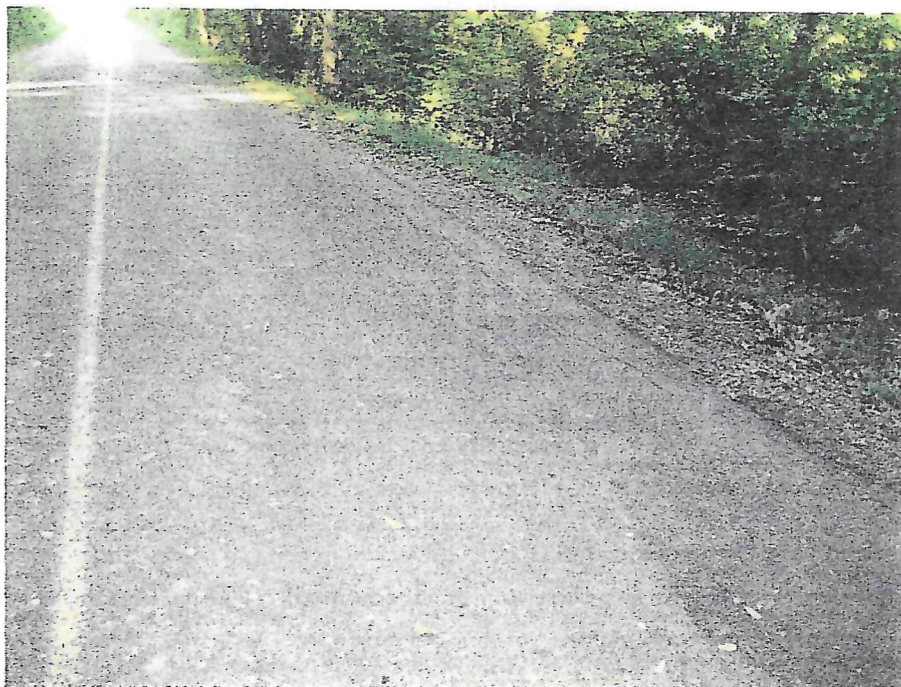
Fatigue Cracking — High Severity



Fatigue Cracking – High Severity



Fatigue Cracking – High Severity & Bituminous Patching



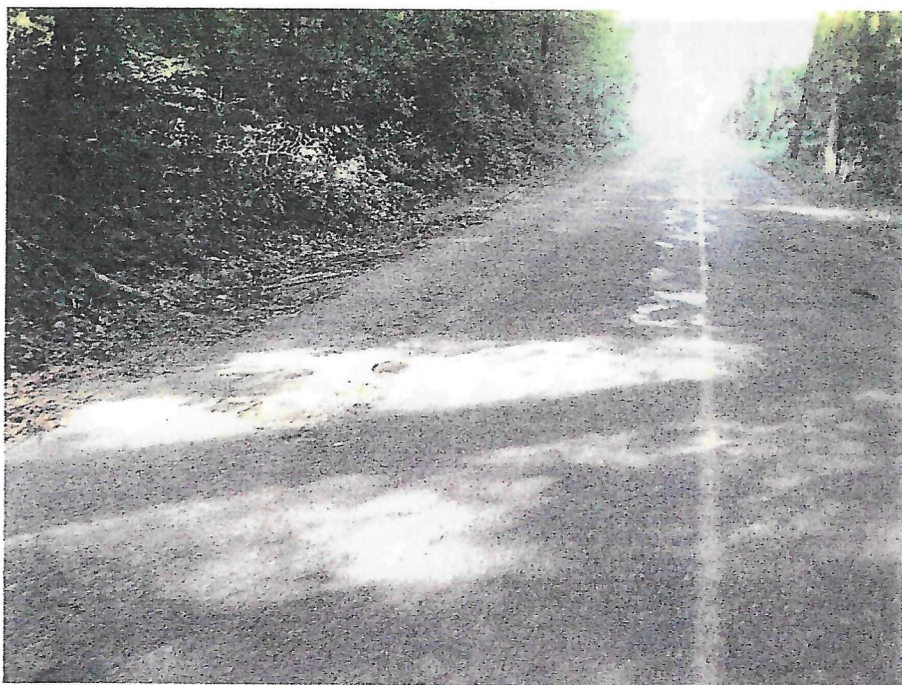
Edge Deterioration – Medium Severity



Fatigue Cracking – Low Severity & Raveling / Weathering – High Severity



Edge Deterioration – Medium Severity



Raveling / Weathering – High Severity



Raveling / Weathering – High Severity, Fatigue Cracking – Medium Severity & Bituminous Patching



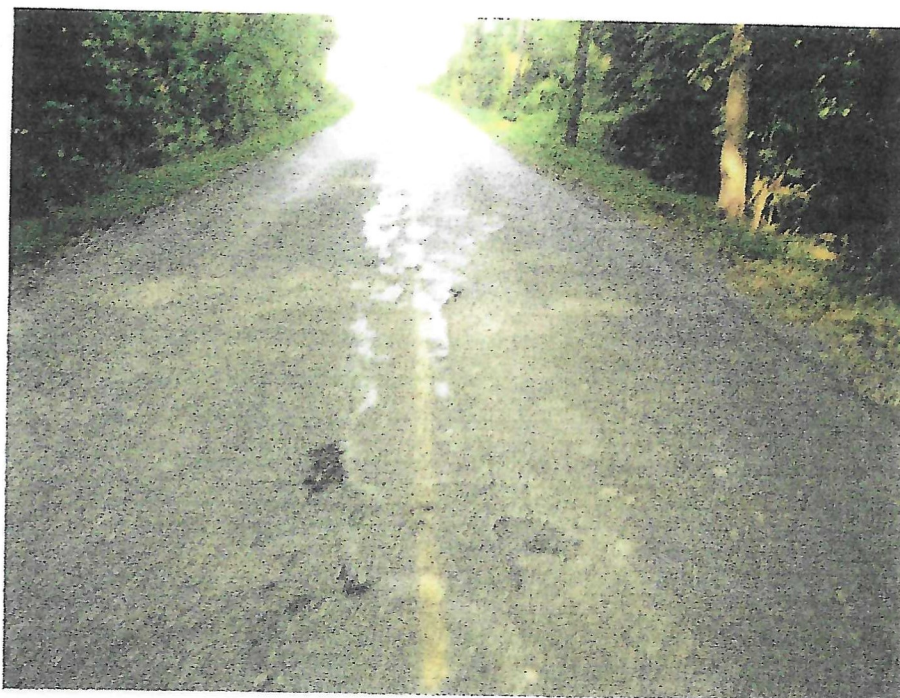
Raveling / Weathering – High Severity, Fatigue Cracking – Medium Severity & Bituminous Patching



Raveling / Weathering – High Severity, Fatigue Cracking – Medium Severity & Bituminous Patching



Raveling / Weathering – High Severity, Fatigue Cracking – Medium Severity & Bituminous Patching



Raveling / Weathering – High Severity & Fatigue Cracking – Medium Severity



Raveling / Weathering – High Severity, Fatigue Cracking – High Severity



Raveling / Weathering – High Severity, Fatigue Cracking – High Severity



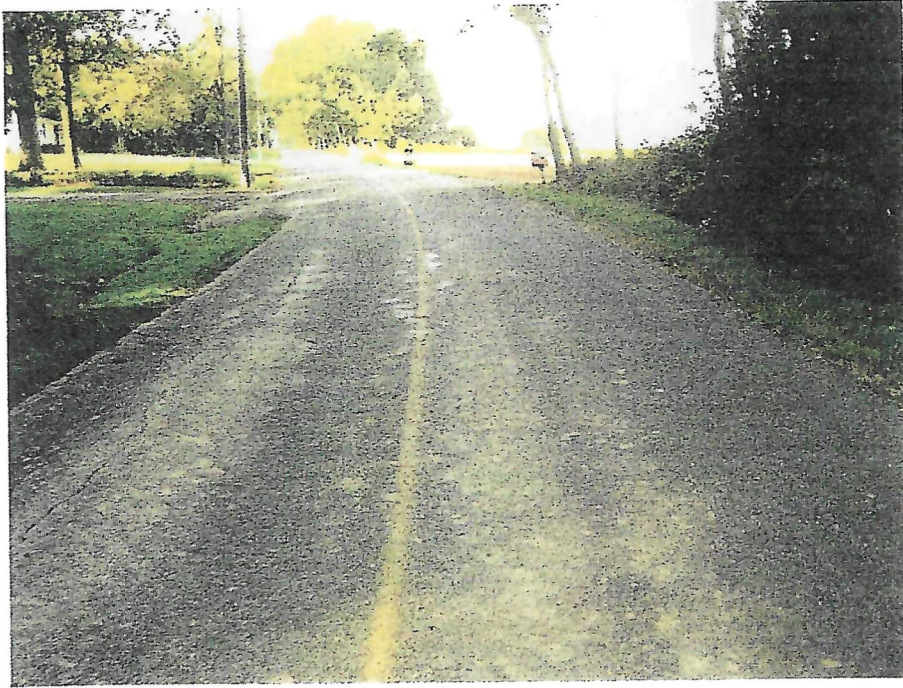
Raveling / Weathering – High Severity, Fatigue Cracking – High Severity



Raveling / Weathering – Medium Severity, Fatigue Cracking – Medium Severity



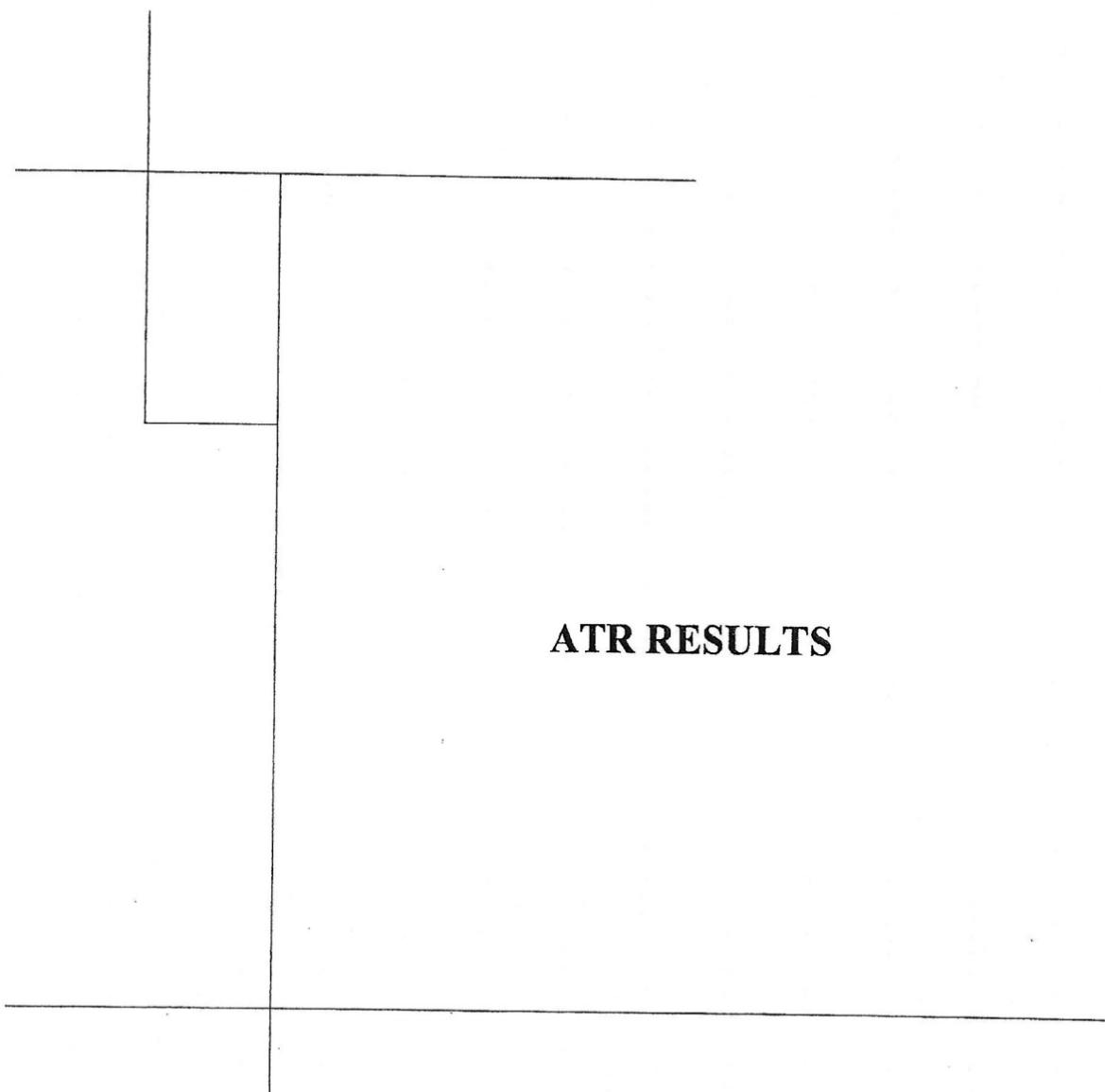
Raveling / Weathering – Medium Severity, Fatigue Cracking – Medium Severity



Fatigue Cracking – High Severity



Fatigue Cracking – Medium Severity



ATR RESULTS

Bethany Rd
Between Memorial Blvd & Municipal Line

HRG, Inc.
369 East Park Drive
Harrisburg, PA 17111
717-564-1121

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
09/20/11	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
00:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
00:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3
01:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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02:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:45	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
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03:30	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
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04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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11:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
11:45	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	110	37	2	5	0	0	0	0	0	0	0	0	1	155
Percent	0.0%	71.0%	23.9%	1.3%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	

608814

Bethany Rd
Between Memorial Blvd & Municipal Line

HRG, Inc.
369 East Park Drive
Harrisburg, PA 17111
717-564-1121

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Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12 PM	0	4	0	0	1	0	0	0	0	0	0	0	0	0	5
12:15	0	3	1	0	0	0	0	0	0	0	0	0	0	1	5
12:30	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
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14:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
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15:45	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5
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18:15	0	4	0	0	1	0	0	1	0	0	0	0	0	0	9
18:30	0	2	2	0	0	0	0	0	0	0	0	0	0	0	6
18:45	0	18	5	0	1	0	0	1	0	0	0	0	0	0	4
19:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	25
19:15	0	2	1	0	0	0	0	0	0	0	0	0	0	0	5
19:30	0	4	1	0	0	0	0	0	0	0	0	0	0	0	3
19:45	0	4	1	0	1	0	0	0	0	0	0	0	0	0	5
20:00	0	14	4	0	1	0	0	0	0	0	0	0	0	0	6
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20:30	0	2	0	0	1	0	0	0	0	0	0	0	0	1	5
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22:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	7
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23:15	0	2	0	0	0	0	0	0	0	0	0	0	0	0	6
23:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	121	36	2	10	0	0	1	0	0	0	0	0	0	4
Percent	0.0%	69.5%	20.7%	1.1%	5.7%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	174
Grand Total	0	231	73	4	15	0	0	1	0	0	0	0	0	5	329
Percent	0.0%	70.2%	22.2%	1.2%	4.6%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	

Bethany Rd
Between Memorial Blvd & Municipal Line

HRG, Inc.
369 East Park Drive
Harrisburg, PA 17111
717-564-1121

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
09/20/11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
00:30	0	2	0	0	1	0	0	0	0	0	0	0	0	0	3
00:45	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	3	1	0	1	0	0	0	0	0	0	0	0	1	6
01:15	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
01:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
01:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:15	0	2	2	0	1	0	0	0	0	0	0	0	0	0	5
02:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
06:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
06:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
06:30	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
06:45	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
07:00	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
07:15	0	6	4	0	0	0	0	0	0	0	0	0	0	0	10
07:30	0	2	1	0	1	0	0	0	0	0	0	0	0	0	4
07:45	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3
08:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:15	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
08:30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:45	0	6	2	0	0	0	0	0	0	0	0	0	0	0	8
09:00	0	10	4	1	1	0	0	0	0	0	0	0	0	0	16
09:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
09:30	0	6	1	0	0	0	0	0	0	0	0	0	0	0	7
09:45	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	10	3	0	0	0	0	0	0	0	0	0	0	0	13
11:00	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
11:15	0	1	1	0	1	0	0	0	0	0	0	0	0	0	3
11:30	0	1	1	0	0	0	0	0	0	0	0	0	0	0	3
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	55	28	1	5	0	0	1	0	0	0	0	0	1	91
Percent	0.0%	60.4%	30.8%	1.1%	5.5%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	

608814

Bethany Rd
Between Memorial Blvd & Municipal Line

HRG, Inc.
369 East Park Drive
Harrisburg, PA 17111
717-564-1121

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
12 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
12:15	0	3	2	0	0	0	0	1	0	0	0	0	0	1	7
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	6	1	0	0	0	0	0	0	0	0	0	0	0	7
13:00	0	12	3	0	0	0	0	1	0	0	0	0	0	1	17
13:15	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
13:30	0	4	2	0	0	0	0	0	0	0	0	0	0	0	6
13:45	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
14:00	0	4	3	0	0	0	0	0	0	0	0	0	0	0	7
14:15	0	16	5	0	0	0	0	0	0	0	0	0	0	0	21
14:30	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
14:45	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
15:00	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
15:15	0	2	0	1	0	0	0	0	0	0	0	0	0	0	3
15:30	0	1	0	0	0	0	0	0	0	0	0	0	0	3	4
15:45	0	4	1	0	0	0	0	0	0	0	0	0	0	1	6
16:00	0	8	1	1	1	0	0	1	0	0	0	0	0	4	16
16:15	0	2	2	0	1	0	0	0	0	0	0	0	0	0	5
16:30	0	5	2	1	1	0	0	0	0	0	0	0	0	0	9
16:45	0	8	2	0	1	0	0	0	0	0	0	0	0	0	11
17:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
17:15	0	20	7	1	3	0	0	0	0	0	0	0	0	0	31
17:30	0	9	4	0	0	0	0	0	0	0	0	0	0	0	13
17:45	0	4	3	0	0	0	0	0	0	0	0	0	0	0	7
18:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
18:15	0	16	2	0	0	0	0	0	0	0	0	0	0	0	18
18:30	0	34	10	0	0	0	0	0	0	0	0	0	0	0	44
18:45	0	7	1	0	0	0	0	0	0	0	0	0	0	0	8
19:00	0	4	1	1	0	0	0	0	0	0	0	0	0	0	9
19:15	0	7	1	0	0	0	0	0	0	0	0	0	0	0	8
19:30	0	4	0	0	1	0	0	0	0	0	0	0	0	0	5
19:45	0	22	6	1	1	0	0	0	0	0	0	0	0	0	30
20:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
20:15	0	3	0	0	0	0	0	0	0	0	0	0	0	1	4
20:30	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
20:45	0	5	2	0	0	0	0	0	0	0	0	0	0	1	8
21:00	0	11	5	0	0	0	0	0	0	0	0	0	0	2	18
21:15	0	2	1	0	0	0	0	0	0	0	0	0	0	1	4
21:30	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
21:45	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
22:00	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
22:15	0	12	3	0	0	0	0	0	0	0	0	0	0	1	16
22:30	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
22:45	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
23:00	0	7	1	0	1	0	0	0	0	0	0	0	0	0	9
23:15	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
23:30	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23:45	0	1	0	0	0	0	0	0	0	0	0	0	0	2	3
Total	0	4	2	0	0	0	0	0	0	0	0	0	0	2	8
Percent	0.0%	165	48	4	8	0	0	2	0	0	0	0	0	10	237
Grand Total	0	220	76	5	13	0	0	3	0	0	0	0	0	11	328
Percent	0.0%	67.1%	23.2%	1.5%	4.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	3.4%	

0 451 149 9 28 0 0 4 0 0 0 0 0 0 0 0
+ 16
467

71.1 22.7 1.4 4.3 0.6

74.7 23.2 1.4

608814

GEOTECHNICAL DATA

CTL

Certified Testing Laboratories, Inc.**Astrotech division**

Special form A-STSTR3 ©1999 CTL, Inc.

7801 Allentown Blvd. Harrisburg, PA 17112 Ph: (717) 652-1750 Fx: (717) 652-0810

Inspection · Testing · Research · Soils · Concrete · Steels · Industrial Radiology · NDE Examinations

CLIENT:	HRG Herbert, Roland & Grubic 369 East Park Drive Harrisburg, PA 17111		Date:	09-19-11		
			Report #	VI-1		
			Lab #	H-0824-04		
Project:	Mill Creek Township, East Bethany Road				Time:	8:00 AM
Inspection Required:	Core Drilling				Fax #	--
Specification:	--					
Material:	Asphalt	Location:	Bethany Road			
Technician:	B. Emerson	Weather:	Cloudy	Page	1	of 1

Report of Visual Inspection

Astrotech Technician B. Emerson, arrived on site to perform tests and he reported the following:

I met with the Engineer from HRG. He chose 3 locations in an approximate 1/4 mile area. I completed Core Drilling using a 6" Coring Bit; the results are as follows:

Core #1 Top Coat – 1-1/2"
 Middle Coat – 3-1/2"
 Base Coat – 1-1/2"
 Total 6-1/2"

Core #2 Top Coat – 1-1/4"
 Middle Coat – 1-1/4"
 Base Coat – 2-1/4"
 Total 4-3/4"

Core #3 Top Coat – 1"
 Middle Coat – 3-1/2"
 Base Coat – 1"
 Total 5-1/2"

RECEIVED
 SEP 27 2011
 ACCOUNTING DEPT

Respectfully submitted,


 ASTROTECH DIVISION



Certified Testing Laboratories, Inc.

ASTROTECH DIVISION

7801 Allentown Blvd. Harrisburg, PA 17112 Ph: (717) 652-1750 Fax: (717) 652-0810

Inspection · Testing · Research · Soils · Concrete · Steels · Industrial Radiology · NDT Examinations · CWI

Certificate of Test and Analysis

For: Herbert, Roland & Grubic

Date: 09-26-11
Lab # H-0824-04
Report # CTA-A-1

On Sample of: Soil Material

Received: 09-20-2011

Marked: Mill Creek Township-East Bethany Rd., Lebanon County

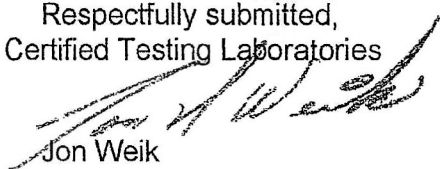
Examined with the following results: ASTM D1883 Laboratory Determination of California Bearing Ration of Soils

CBR Value = 9.7

Soil Description: Dark Grayish Brown Silty Sand W/Some Gravel and Trace Organics

Report to: Above

Respectfully submitted,
Certified Testing Laboratories


Jon Weik
General Manager

608814



DARWIN PAVEMENT ANALYSES

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product
HRG

Overlay Design Module

Job Number 006099.0425
Bethany Road WITHOUT Restrictions
Bethany Road Weight Restriction Study
Millcreek Township
Lebanon County

AC Overlay of AC Pavement

Structural Number for Future Traffic

1.69 in

Design Method
Component Analysis
Remaining Life
Non-Destructive Testing

Effective Existing
Structural Number (in)

1.42

Overlay
Structural Number (in)

0.27

Structural Number for Future Traffic

Future 18-kip ESALs Over Design Period	41,840
Initial Serviceability	4.2
Terminal Serviceability	2
Reliability Level	80 %
Overall Standard Deviation	0.45
Subgrade Resilient Modulus	9,830 psi

Calculated Structural Number for Future Traffic

1.69 in

Effective Pavement Thickness - Component Analysis Method

Layer	Material Description	Structural Coefficient	Drainage Coefficient	Thickness (in)
1	Bituminous Concrete	0.3	1	1.25
2	Bituminous Concrete	0.3	1	1.25
3	Bituminous Concrete	0.3	1	2.25

Milling Thickness

0 in

Calculated Results

Calculated Pavement Structural Number Before Milling	1.42 in
Calculated Effective Pavement Structural Number	1.42 in

Future Rigorous ESAL Calculation

DONE BY MTT DATE 9/27/11
CHECKED BY AS DATE 11/11

Performance Period (years) 20
 Two-Way Traffic (ADT) 657
 Number of Lanes in Design Direction 1
 Percent of All Trucks in Design Lane 100 %
 Percent Trucks in Design Direction 50 %

Vehicle Class	Percent of ADT	Annual % Growth	Average Initial Truck Factor (ESALs/Truck)	Annual % Growth in Truck Factor	Accumulated 18-kip ESALs over Performance Period
1	0	0.69	0	0	0
2	71	0.69	0	0	0
3	22.7	0.69	0	0	0
4	1.4	0.69	0.24	0	8,614
5	4.3	0.69	0.24	0	26,457
6	0	0.69	0.82	0	0
7	0	0.69	4.5	0	0
8	0.6	0.69	0.44	0	6,768
9	0	0.69	1	0	0
10	0	0.69	0.75	0	0
11	0	0.69	2.33	0	0
12	0	0.69	1.28	0	0
13	0	0.69	1.28	0	0
Total	100	-	-	-	41,840

Growth Compound

Total Calculated Cumulative ESALs 41,840

Effective Roadbed Soil Resilient Modulus

Period	Description	Roadbed Resilient Modulus (psi)
1	Spring	7,760
2	Summer	9,700
3	Fall	9,700
4	Winter	19,400

Calculated Effective Modulus 9,830 psi

DONE BY MTH DATE 9/27/11
 CHECKED BY RSK DATE 9/27/11

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product
HRG

Overlay Design Module

Job Number 006099.0425
Bethany Road NO Class 8
Bethany Road Weight Restriction Study
Millcreek Township
Lebanon County

AC Overlay of AC Pavement

Structural Number for Future Traffic

1.64 in

Design Method
Component Analysis
Remaining Life
Non-Destructive Testing

Effective Existing
Structural Number (in)
1.42

Overlay
Structural Number (in)
0.22

Structural Number for Future Traffic

Future 18-kip ESALs Over Design Period 34,858
Initial Serviceability 4.2
Terminal Serviceability 2
Reliability Level 80 %
Overall Standard Deviation 0.45
Subgrade Resilient Modulus 9,830 psi

Calculated Structural Number for Future Traffic

1.64 in

Effective Pavement Thickness - Component Analysis Method

<u>Layer</u>	<u>Material Description</u>	<u>Structural Coefficient</u>	<u>Drainage Coefficient</u>	<u>Thickness (in)</u>
1	Bituminous Concrete	0.3	1	1.25
2	Bituminous Concrete	0.3	1	1.25
3	Bituminous Concrete	0.3	1	2.25

Milling Thickness

0 in

Calculated Results

Calculated Pavement Structural Number Before Milling 1.42 in
Calculated Effective Pavement Structural Number 1.42 in

Future Rigorous ESAL Calculation

DESIGNED BY MTT DATE 10/3/11
CHECKED BY BT DATE 10/3/11

Performance Period (years) 20
 Two-Way Traffic (ADT) 653
 Number of Lanes in Design Direction 1
 Percent of All Trucks in Design Lane 100 %
 Percent Trucks in Design Direction 50 %

Vehicle Class	Percent of ADT	Annual % Growth	Average Initial Truck Factor (ESALs/Truck)	Annual % Growth in Truck Factor	Accumulated 18-kip ESALs over Performance Period
1	0	0.69	0	0	0
2	71.5	0.69	0	0	0
3	22.8	0.69	0	0	0
4	1.4	0.69	0.24	0	8,562
5	4.3	0.69	0.24	0	26,296
6	0	0.69	0.82	0	0
7	0	0.69	4.5	0	0
8	0	0.69	0.44	0	0
9	0	0.69	1	0	0
10	0	0.69	0.75	0	0
11	0	0.69	2.33	0	0
12	0	0.69	1.28	0	0
13	0	0.69	1.28	0	0
Total	100	-	-	-	34,858

Growth Compound

Total Calculated Cumulative ESALs 34,858

Effective Roadbed Soil Resilient Modulus

Period	Description	Roadbed Resilient Modulus (psi)
1	Spring	7,760
2	Summer	9,700
3	Fall	9,700
4	Winter	19,400

Calculated Effective Modulus 9,830 psi

DONE BY MTH DATE 8/3/11
 CHECKED BY BTB DATE 8/3/11

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product
HRG

Overlay Design Module

Job Number 006099.0425
Bethany Road WITH Restrictions
Bethany Road Weight Restriction Study
Millcreek Township
Lebanon County

AC Overlay of AC Pavement

Structural Number for Future Traffic

1.27 in

Design Method
Component Analysis
Remaining Life
Non-Destructive Testing

Effective Existing
Structural Number (in)

1.42

Overlay
Structural Number (in)

0.00

Structural Number for Future Traffic

Future 18-kip ESALs Over Design Period	8,780
Initial Serviceability	4.2
Terminal Serviceability	2
Reliability Level	80 %
Overall Standard Deviation	0.45
Subgrade Resilient Modulus	9,830 psi

Calculated Structural Number for Future Traffic

1.27 in

Effective Pavement Thickness - Component Analysis Method

<u>Layer</u>	<u>Material Description</u>	<u>Structural Coefficient</u>	<u>Drainage Coefficient</u>	<u>Thickness (in)</u>
1	Bituminous Concrete	0.3	1	1.25
2	Bituminous Concrete	0.3	1	1.25
3	Bituminous Concrete	0.3	1	2.25

Milling Thickness

0 in

Calculated Results

Calculated Pavement Structural Number Before Milling	1.42 in
Calculated Effective Pavement Structural Number	1.42 in

Future Rigorous ESAL Calculation

DONE BY MTH DATE 9/27/11
CHECKED BY BJL DATE 9/27/11

Performance Period (years) 20
 Two-Way Traffic (ADT) 625
 Number of Lanes in Design Direction 1
 Percent of All Trucks in Design Lane 100 %
 Percent Trucks in Design Direction 50 %

Vehicle Class	Percent of ADT	Annual % Growth	Average Initial Truck Factor (ESALs/Truck)	Annual % Growth in Truck Factor	Accumulated 18-kip ESALs over Performance Period
1	0	0.69	0	0	0
2	74.7	0.69	0	0	0
3	23.8	0.69	0	0	0
4	1.5	0.69	0.24	0	8,780
5	0	0.69	0.24	0	0
6	0	0.69	0.82	0	0
7	0	0.69	4.5	0	0
8	0	0.69	0.44	0	0
9	0	0.69	1	0	0
10	0	0.69	0.75	0	0
11	0	0.69	2.33	0	0
12	0	0.69	1.28	0	0
13	0	0.69	1.28	0	0
Total	100	-	-	-	8,780

Growth

Compound

Total Calculated Cumulative ESALs

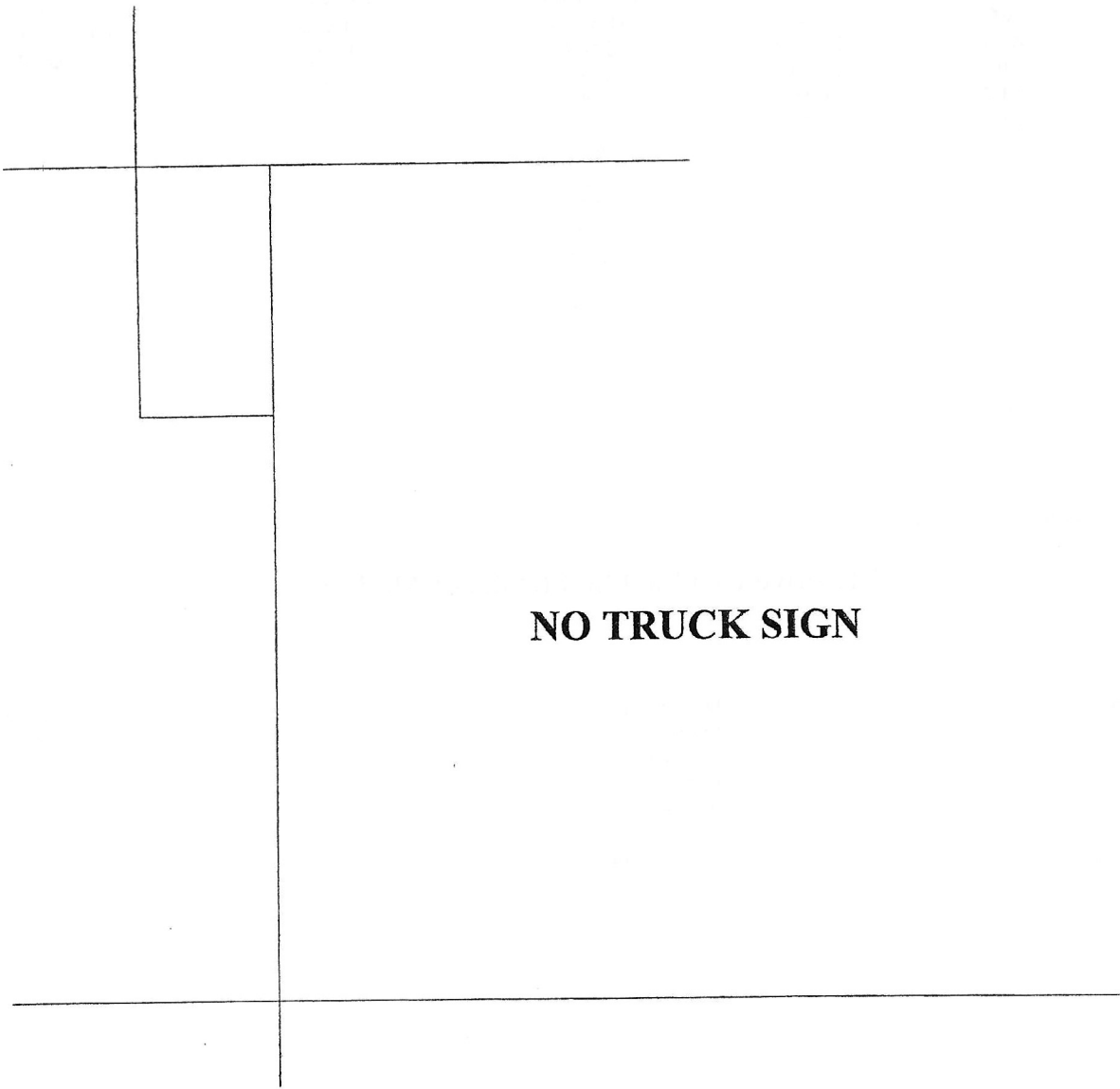
8,780

Effective Roadbed Soil Resilient Modulus

Period	Description	Roadbed Resilient Modulus (psi)
1	Spring	7,760
2	Summer	9,700
3	Fall	9,700
4	Winter	19,400
Calculated Effective Modulus		9,830 psi

DONE BY MTT DATE 9/27/11
 CHECKED BY BSC DATE 9/27/11

608814



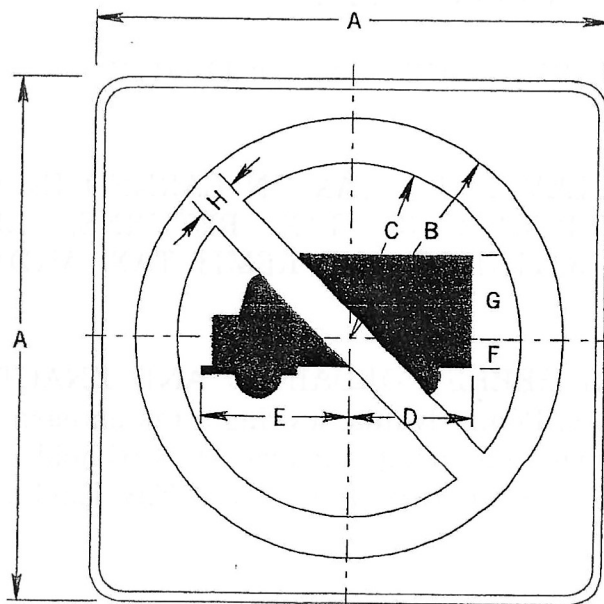
NO TRUCK SIGN

R5-2

NO TRUCK SIGN

(a) Justification. The No Truck Sign (R5-2) shall be authorized for use to prohibit trucks, except that such vehicles may be operated thereon for the purpose of delivering or picking up materials or merchandise. When local truck deliveries are permitted, the Except Local Deliveries Sign (R5-2-3) shall be mounted beneath the R5-2 sign.

(b) Size. The standard size of the R5-2 sign shall be 600 mm by 600 mm (24" x 24").



DIMENSIONS - mm (IN)										
SIGN SIZE A x A	B	C	D	E	F	G	H	MAR- GIN	BOR- DER	BLANK STD.
600 x 600 (24" x 24")	262 (10.5)	212 (8.5)	162 (6.5)	187 (7.5)	94 (1.8)	107 (4.3)	50 (2)	10 (0.4)	15 (0.6)	B3-600 (B3-24)
750 x 750 (30" x 30")	330 (13.2)	265 (10.6)	203 (8.1)	234 (9.4)	117 (4.7)	133 (5.3)	65 (2.6)	10 (0.4)	20 (0.8)	B3-750 (B3-30)
900 x 900 (36" x 36")	395 (15.8)	320 (12.8)	244 (9.8)	282 (11.3)	141 (5.6)	160 (6.4)	75 (3)	15 (0.6)	25 (1)	B3-900 (B3-36)
1200 x 1200 (48" x 48")	525 (21)	425 (17)	325 (13)	375 (15)	188 (7.5)	213 (8.5)	100 (4)	20 (0.8)	30 (1.2)	B3-1200 (B3-48)

COLOR:

SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)

CIRCLE AND SLASH:
RED (REFLECTORIZED)

BACKGROUND:
WHITE (REFLECTORIZED)

APPROVED FOR THE SECRETARY OF TRANSPORTATION

By : Alan C. Rowe Date : 06-30-08
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Bureau of Highway Safety and Traffic Engineering