

ORDINANCE NO. 131

AN ORDINANCE OF THE TOWNSHIP OF DAUGHERTY, BEAVER COUNTY, PENNSYLVANIA, IMPOSING WEIGHT RESTRICTIONS OF VEHICLES OPERATED UPON CERTAIN TOWNSHIP ROADS; PROVIDING FOR THE ISSUANCE OF PERMITS FOR MOVEMENT OF VEHICLES OF WEIGHTS IN EXCESS OF RESTRICTIONS; AND PRESCRIBING PENALTIES FOR VIOLATIONS.

Article I Short Title

This Ordinance shall be known and may be cited as the "Daugherty Township Motor Vehicle Gross-Weight Limit Ordinance."

Article II Authority

This Ordinance is enacted pursuant to the authority conferred by the "Vehicle Code," Act of 1976, June 17, P.L. 162, No. 81, Section 1, effective July 1, 1977 (75 Pa. C.S.A. Sec. 101 et seq.), as amended and is intended to include and be subject to all provisions of Section 4902 of the "Vehicle Code," 75 Pa. C.S.A., Section 4902 and all Pennsylvania Department of Transportation regulations promulgated or to be promulgated under the "Vehicle Code," by way of illustration and not limitation, under Sections 4902 and 6103 (75 Pa. C.S.A., Section 4902(f) and 6103).

Article III Statement of Findings

- A. At their Regular Meeting on September 10, 2008, the Board of Supervisors of Daugherty Township authorized Township Engineer Daniel C. Baker Associates to evaluate and establish a Weight Limit Restriction for twenty-one township roads located in Daugherty Township. The 2008 Engineering and Traffic Study attached hereto as Appendix A was prepared in order to analyze and establish a weight limit restriction based on field inspections of roadway geometric, pavement analysis, and past experience as defined in PennDOT Publication 201, Engineering and Traffic Studies, subchapter G. The procedures in the study comply with the Pennsylvania State Law and Regulation-Title 75, Vehicle Code, Chapter 49, Section 4902, Restrictions on Use of Highway and Bridges and Pennsylvania Code, Title 67, Transportation, Chapter 189, Hauling in Excess of Posted Weight Limits. Also the study included guidelines contained in PennDOT Publication 221, Posting & Bonding Procedures for Municipal Highways.
- B. The Board of Supervisors has determined and hereby determines based upon the findings of the 2008 Engineering and Traffic Study conducted by Township Engineer Daniel C. Baker Associates Incorporated that the roads included in the study meet the criteria, as defined in Title 75 Motor Vehicle Code Section 4902, to prohibit the operation of vehicles and impose restrictions as to the

weight or size of vehicles operated upon a highway. The following findings provide justification to prohibit the operation of vehicles and impose gross-weight limit restrictions:

- (i) Overweight vehicles have exceeded the strength of the existing Daugherty Township roads. These roads that have withstood the pounding of ordinary loads no longer appear to be adequate to meet the present day conditions. Wide spread failure is demonstrative of the fact the roads cannot carry unlimited loading. Weight restrictions are necessary in order to protect the infrastructure from premature deterioration due to repeated loading of overweight trucks and climatic conditions.
- (ii) Geometric review has found that some township roads have inadequate turning movements for large size vehicles. The dimension and minimum turning path of a vehicle affects the turning movement and width of traveled way in the intersection areas. Conflict occur between vehicles when traffic is either diverging, weaving or crossing into opposing traffic lanes due to inadequate turning movements.
- (iii) Pavement analysis indicated that all roads inspected under the Traffic Study do not meet the current minimum depths of pavement course established in the Daugherty Township Subdivision and Land Development Ordinance No. 89. The Engineering and Traffic Study found all roads inspected were treated with an emulsion based chip seal. Emulsion based chip seal are used as pavement preservation treatment on pavement. Their primary purpose is to seal fine cracks in the underlying pavements surface and prevent water intrusion into the base and sub-grade. Chip seal are not expected to provide additional structural capacity to the pavement. The pavement analysis also found some roads were constructed with FB mixes, which are considered to be highly flexible because the mix has a high void content. Because of its flexibility FB bituminous material is recommended for use on low volume roads that have highly flexible existing pavement structures.

C. The following roads may be damaged or destroyed unless the permissible weight of motor vehicles is restricted to a weight limit of seven and one half tons between those intersections listed and for the distance set forth:

- (i) Fourth Street (T-321), from intersection with S.R. 65 westward for a distance of 1,243 feet to its terminus.
- (ii) Main Avenue (T-845), from intersection with S.R. 65 eastward for a distance of 2,850 feet to its terminus.
- (iii) Florence Road (T-434), from intersection with Main Avenue to Ridgevue Road 2,370 feet.
- (iv) McGuire Street (T-829), from intersection with Stuber Road to Stuber Road 2,222 feet.
- (v) Stuber Road (T-542), from intersection with S.R. 65 to North Sewickley Township Line 7,200 feet.

- (vi) Nelson Avenue (T-847), from intersection with Stuber Road to Shanor Drive 1,467 feet.
- (vii) Hilton Drive (T-846), from intersection with S.R. 65 to Klein Road 1,281 feet.
- (viii) Klein Road (T-825), from intersection with Wisers Grove Road to Hilton Drive 2,750 feet.
- (ix) Franklin Road (T-850), from intersection with S.R. 65 to Scott Street 1,158 feet.
- (x) Silver Spring Road (T-585), from intersection with Blockhouse Run Road to Dogwood Drive 5,221 feet.
- (xi) Frishkorn Road (T-571), from intersection with Block Run Road to its terminus 3,354 feet.
- (xii) Drushel Road (T-563), from intersection with Tulip Drive to New Sewickley Township Line 3,178 feet.
- (xiii) Helbling Road (T-567), from intersection with Tulip Drive to New Sewickley Township Line 2,805 feet.
- (xiv) Hogue Drive (T-839), from East End of Hogue Drive to West End of Hogue Drive 519 feet.
- (xv) Inman Drive (T-831), from intersection with S.R. 68 to Hogue Drive 1,710 feet.
- (xvi) John Street (T-818), from intersection with Marion Hill Road to its terminus 1,302 feet.

D. The following roads may be damaged or destroyed unless the permissible weight of motor vehicles is restricted to a weight limit of ten tons between those intersections listed and for the distance set forth:

- (i) Goehring Road (T-849), from intersection with Harmony Road to Tulip Drive 3,492 feet.
- (ii) Allendale Road (T-553), from intersection with Pittsburgh Road to Rochester Township Line 6,474 feet.
- (iii) Londonderry Drive (T-859), from intersection with Marion Hill Road to Drum Cliff Drive 2,478 feet.
- (iv) Drum Cliff Drive (T-860), from intersection with Londonderry Drive to Hillcrest Drive 645 feet.
- (v) Hillcrest Drive, from intersection Marion Hill Road to its terminus 1,469 feet.

Article IV Definitions

The following words when used in this Ordinance shall have the following meanings, unless the context clearly indicates otherwise:

BOARD OF SUPERVISORS- The Board of Supervisors of Daugherty Township, Beaver County, Pennsylvania.

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 Sec. 6106 of the Vehicle Code (relating to designation of emergency vehicles by Pennsylvania State Police).

MOTOR VEHICLE- Any vehicle or combination as defined and/or governed by the Vehicle Code, 75 Pa. C.S.A., Section 102 et seq., as amended.

LOCAL TRAFFIC- Emergency vehicles and school buses, defined hereinafter, vehicles and combinations or governmental entities and utilities where their contractors are engaged in construction or maintenance on a posted highway or in a location which can be reached only via a posted highway, and vehicles and combinations going to or coming from a residence or farm located on a posted highway or which can be reached only via a posted highway.

PERSON- An individual, partnership, public or private association or corporation, or a governmental unit, public utility or any other legal entity whatsoever which is recognized by law as the subject of rights and duties.

RIGHT-OF-WAY- A strip of land acquired by reservation, dedication, forced dedication, prescription, condemnation and intended to be occupied by a road, crosswalk, railroad, electric transmission lines, oil or gas pipeline, water line, sanitary, or storm sewer and other similar uses; generally, the right of one to pass over the property of another.

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.

TOWNSHIP- Daugherty Township, a Second Class Township located in Beaver County, Pennsylvania.

TOWNSHIP MANAGER- The Manager of Daugherty Township.

TOWNSHIP ROAD- An alley, avenue, boulevard, highway, freeway, parkway, lane, street, viaduct and any other ways used by vehicular traffic but not including driveways, private roads, parking areas, sidewalks or walkways which is accepted for dedication by the Board of Supervisors and maintained by Daugherty Township. Township Road includes the entire right-of-way.

Article V Motor Vehicle Weight Limits Established

- A. Pursuant to the findings under Article III, and by the authority of Section 4902 of the "Vehicle Code" and regulations promulgated thereunder, no motor vehicle or combination shall be operated upon any of the township roads listed in Article III with gross weight in excess of the weight limits listed for said road in Article III.
- B. Local traffic as defined herein shall be exempted from the restrictions imposed under sub-section (A) above. However, if the Township Manager or a representative of the township determines that any local traffic is likely to damage the road, the Township Manager or a representative of the township will so notify the registrants of the motor vehicle or combination and will also notify the New Brighton Area Police Department. After two (2) business days following delivery of the notice, or after five (5) days following mailing of the notice, such local traffic vehicles shall not exceed the weight limits except in accordance with Article VI hereof.

Article VI Permits

Permitting shall be in accordance with the provisions of the Pennsylvania Code, Title 67, Chapter 189, Hauling in Excess of Posted Weight Limits and Chapter 179 Oversize and Overweight Loads and Vehicles.

Article VII 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 Article III of this Ordinance. In the case of a restriction on a township road which 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 which would allow drivers to avoid the restricted portion of road.

Article VIII Enforcement

The New Brighton Area Police Department, pursuant to any and all legislative authority, have been and are being hereby confirmed as having full and regulatory powers to enforce all provisions of the Vehicle Code, according to and as permitted by the terms and provisions of the said Vehicle Code and any and all related legislation and to prosecute according to law any violators thereof. The Township Manager and/or his/her designee shall be the enforcement officer for the issuance of all Permits and to prosecute according to law any violators thereof.

Article IX Penalty

Penalties for violation of any provisions of this ordinance shall be in accordance with the provisions of Sections 4902, 4907 and 6506 of the Pennsylvania Motor Vehicle Code (75 Pa C.S.A.) as well as the Pennsylvania Code, Title 67, Transportation, Chapter 179, Oversize and Overweight Loads and Vehicles.

Article X Effective Date

This Ordinance shall become effective five (5) days after the final enactment or adoption and shall remain in full force and effect until amended or revoked.

Article XI Repealer

All Ordinances or parts of Ordinances inconsistent with the provisions of this Ordinance are hereby repealed to the extent of such inconsistency.

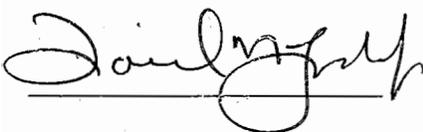
Article XII Severability

If any sentence, clause, section, or part 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, sections, or part of this Ordinance. It is hereby declared that the intent of the Board of Supervisors of Daugherty Township that this Ordinance would have been adopted had such unconstitutional, illegal, or invalid sentence, clause, section, or part thereof not been included therein.

DULY ENACTED AND ORDAINED this 11th day of February, 2009, by the Board of Supervisors of the Township of Daugherty, Beaver County, Pennsylvania, in lawful session duly assembled.

ATTEST:

Township of Daugherty



Daugherty Township

2008 Engineering & Traffic Study



Appendix "A"

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

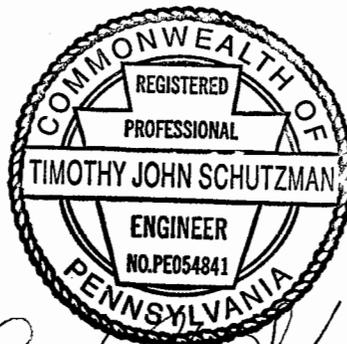
6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020 FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

Daugherty Township 2008 Engineering & Traffic Study

I Timothy John Schutzman, a Registered Professional Engineer of the Commonwealth of Pennsylvania, do here by certify that this Engineering and Traffic Study was performed with the standard of care for professional engineering and related services performed or furnished by Engineers under these studies with the care and skill ordinarily used by members of the subject profession practicing under similar circumstances at the same time and in the same locality. Subject to the standard of care set forth in Pennsylvania Department of Transportation Posting & Bonding Procedures For Municipal Highways Publication 221, Regulations-Title 75, Vehicle Code Chapter 49, Section 4902, Restriction on Use of Highways and Bridges and Hauling in Excess of Posted Weight Limits.



Timothy John Schutzman
PE054841

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

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Daniel C. Baker Associates services have been authorized by the Township of Daugherty to evaluate and establish a Weight Limit Restriction for twenty-one roads located in the Township. This Engineering and Traffic Study is being made to analyze and establish a weight limit restriction based on field inspections of roadway geometric, pavement analysis, and past experience as defined in PennDOT Publication 201, Engineering and Traffic Studies, subchapter G. The procedures in this study will comply with the Pennsylvania State Law and Regulation-Title 75, Vehicle Code, Chapter 49, Section 4902, Restrictions on Use of Highway and Bridges and Pennsylvania Code Title 67, Transportation, Chapter 189, Hauling in Excess of Posted Weight Limits. Also this study will use the guidelines contained in PennDOT Publication 221, Posting & Bonding Procedures for Municipal Highways.

Daugherty Township Roads that were included in this traffic study:

	<u>Road Name</u>	<u>Township Road #</u>	<u>Road Length</u> <u>Liquid Fuel Map / Field Measure</u>
1.	Fourth Street	(T-321)	0.24 Mile / 1,243 Feet
2.	Main Avenue	(T-845)	0.54 Mile / 2,850 Feet
3.	Florence Road	(T-434)	0.45 Mile / 2,370 Feet
4.	McGuire Street	(T-829)	0.42 Mile / 2,222 Feet
5.	Stuber Road	(T-542)	1.36 Mile / 7,200 Feet
6.	Nelson Avenue	(T-847)	0.28 Mile / 1,467 Feet
7.	Hilton Drive	(T-846)	0.24 Mile / 1,281 Feet
8.	Klein Road	(T-825)	0.53 Mile / 2,750 Feet
9.	Franklin Road	(T-850)	0.23 Mile / 1,158 Feet
10.	Silver Spring Road	(T-585)	1.02 Mile / 5,221 Feet
11.	Frishkorn Road	(T-571)	0.64 Mile / 3,354 Feet
12.	Goehring Road	(T-849)	0.66 Mile / 3,492 Feet
13.	Druschel Road	(T-563)	0.57 Mile / 3,178 Feet
14.	Helbling Road	(T-567)	0.55 Mile / 2,805 Feet
15.	Hogue Drive	(T-839)	0.09 Mile / 519 Feet
16.	Inman Drive	(T-831)	0.33 Mile / 1,710 Feet
17.	Allendale Road	(T-553)	1.25 Mile / 6,474 Feet

18.	John Street	(T-818)	0.25 Mile / 1,302 Feet
19.	Londonderry Drive	(T-859)	0.47 Mile / 2,478 Feet
20.	Drum Cliff Drive	(T-860)	0.06 Mile / 645 Feet
21.	Hillcrest Drive		/ 1,469 Feet

Field core samples performed with Daugherty Township Road Department's employees, John Albanese (Crew Leader) and Gerald Inman during the week of September 8th 2008. Gerald Inman has over 30 years experience and John Albanese has approximately 25 years experience working on the Township's Roads. The road department's knowledge and experiences provides informative data into the past history and traffic volumes of the roads studied. Measurements of core samples and core holes were taken by Timothy J. Schutzman, P.E. of Daniel C. Baker Associates.

As defined in Title 75 Motor Vehicle Code Section 4902, Daugherty Township under their jurisdictions may prohibit the operation of vehicles and may impose restrictions as to the weight or size of vehicles operated upon a highway whenever it determined the highway may be damaged or destroyed unless use by vehicles is prohibited or the permissible size or weight of vehicles is reduced. The Township may also impose restrictions if it is determined that hazardous traffic conditions or other safety factor requires such a prohibition or restriction. School buses, emergency vehicles and vehicles making local deliveries or pickups may be exempted from restrictions on the use of highways imposed.

No vehicle or combination shall be driven across the Township Roads with a gross weight in excess of the sum of the allowable weights as set forth in this study. Daugherty Township may issue permits for movement of vehicles of size and weight in excess of restrictions promulgated under their jurisdictions and may require such undertaking or security as they deem necessary to cover the cost to repairs and restoration necessitated by the permitted movement of vehicles.

Daugherty Township shall erect and maintained restriction signs designating the restrictions along a portion of the highway restricted. In the case of a restriction on a highway which does not begin or end at an intersection with an unrestricted highway, the Township shall also place an advance informational sign at the intersection nearest each end of the portion of highway which would allow drivers to avoid the restricted portion of highway. No person shall be convicted of violating subsections unless the restriction sign designating the restricted portion of highway to traffic moving in the direction the person was driving was posted as required. Failure to post the restriction sign designating the portion of highway to traffic moving in the opposite direction or failure to post any advance informational sign shall not constitute a defense to a violation of this section.

This report was written using the guidelines as established in the Pennsylvania State Laws and Regulations Title 75, Vehicle Code Chapter 49, Section 4902, Restrictions on Use of Highways and Bridges and Pennsylvania Code Title 67, Transportation, Chapter 189, Hauling in Excess of Posted Weight Limits. In conjunction with these laws, PennDOT has developed Publication 221, Posting & Bonding Procedures for Municipal Highways. Sections of said publication are included within this report.

Conclusion and Recommendation:

Overweight Vehicles have exceeded the strength of the existing Daugherty Township roads. These roads that have withstood the pounding of ordinary loads no longer appear to be adequate to meet the present day conditions. Wide spread failure is demonstrative of the fact the roads cannot carry unlimited loading. Weight restrictions are necessary in order to protect the infrastructure from premature deterioration due to repeated loading of overweight trucks and climatic conditions.

Geometric review has found that some Township Roads have inadequate turning movements for large size vehicles. The dimension and minimum turning path of a vehicle affects the turning movement and width of traveled way in the intersection areas. Conflict occur between vehicles when traffic is either diverging, weaving or crossing into opposing traffic lanes due to inadequate turning movements.

Pavement analysis indicated that all roads inspected under this Traffic Study do not meet the current minimum depths of pavement course established in the Daugherty Township Subdivision and Land Development Ordinance No. 89. This Engineering and Traffic Study found all roads inspected were treated with an emulsion based chip seal. Emulsion based chip seal are used as pavement preservation treatment on pavement. Their primary purpose is to seal fine cracks in the underlying pavements surface and prevent water intrusion into the base and subgrade. Chip seal are not expected to provide additional structural capacity to the pavement. The pavement analysis also found some roads were constructed with FB mixes, which are considered to be highly flexible because the mix has a high void content. Because of its flexibility FB bituminous material is recommended for use on low volume roads that have highly flexible existing pavement structures.

It is my opinion that a weight limit of seven and one half tons be posted on the below identified Township Roads. This is necessary to prevent further damage, deterioration and reduce the possible hazardous conditions. I recommend a weight limit of seven and one half tons be imposed upon those Township Roads, between those intersections listed and for the distance set forth:

1. Fourth Street (T-321), from intersection with S.R. 65 westward for a distance of 1,243 feet to its terminus.
2. Main Avenue (T-845), from intersection with S.R. 65 eastward for a distance of 2,850 feet to its terminus.
3. Florence Road (T-434), from intersection with Main Avenue to Ridgeway Road 2,370 feet.
4. McGuire Street (T-829), from intersection with Stuber Road to Stuber Road 2,222 feet.
5. Stuber Road (T-542), from intersection with S.R. 65 to North Sewickley Township Line 7,200 feet.
6. Nelson Avenue (T-847), from intersection with Stuber Road to Shanor Drive 1,467 feet.
7. Hilton Drive (T-846), from intersection with S.R. 65 to Klein Road 1,281 feet.
8. Klein Road (T-825), from intersection with Wises Grove Road to Hilton Drive 2,750 feet.
9. Franklin Road (T-850), from intersection with S.R. 65 to Scott Street 1,158 feet.

10. Silver Spring Road (T-585), from intersection with Blockhouse Run Road to Dogwood Drive 5,221 feet.
11. Frishkorn Road (T-571), from intersection with Block Run Road to its terminus 3,354 feet.
12. Druschel Road (T-563), from intersection with Tulip Drive to New Sewickley Township Line 3,178 feet.
13. Helbling Road (T-567), from intersection with Tulip Drive to New Sewickley Township Line 2,805 feet.
14. Hogue Drive (T-839), from East End of Hogue Drive to West End of Hogue Drive 519 feet.
15. Inman Drive (T-831), from intersection with S.R. 68 to Hogue Drive 1,710 feet.
16. John Street (T-818), from intersection with Marion Hill Road to its terminus 1,302 feet.

It is my opinion that a weight limit of ten tons be posted on the below identified Township Roads. This is necessary to prevent further damage, deterioration and reduce the possible hazardous conditions. I recommend a weight limit of ten tons be imposed upon those Township Roads, between those intersections listed and for the distance set forth:

1. Goehring Road (T-849), from intersection with Harmony Road to Tulip Drive 3,492 feet.
2. Allendale Road (T-553), from intersection with Pittsburgh Road to Rochester Township Line 6,474 feet.
3. Londonderry Drive (T-859), from intersection with Marion Hill Road to Drum Cliff Drive 2,478 feet.
4. Drum Cliff Drive (T-860), from intersection with Londonderry Drive to Hillcrest Drive 645 feet.
5. Hillcrest Drive, from intersection Marion Hill Road to its terminus 1,469 feet.

Appropriate restriction signs shall be erected as shown on the attached plan.

Fourth Street

T - 3 2 1

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FAX: (724) 495-2594

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Fourth Street

T. R. No.: 321

From: S.R. 65

To: Cul-de-Sac

Posted Speed Limit: No

ADT: 500±

Total Length of Road (Ft.): 1,243

HIGHWAY RESTRICTIONS:

- Geometric Review** – The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** – An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** – A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 1 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Few Sections

Cross Section Deterioration: Yes

Surface Alligatored: Mild

Shoulder Damage: N/A

Other: Road surface narrows from 30 feet wide to 15 1/2 feet. Damage to edge of road surface is evident along this narrow area.

- Traffic Generators** - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Fourth Street.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

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WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Fourth Street

T. R. No.: T-321

From: S.R. 65

To: Cul-de-Sac

Posted Speed Limit: None

ADT: ± 500

Posted Weight Limit: None

Surface Type/Depth: Chip Seal Pavement
(1 inch)

Base Course/Depth: Wearing Cold Mix FB
(1 ½ inch)
Base Slag (6 ½ inch)

Width of Surface: 30' - 15.5'

Shoulder Width/Type: N/A

Vertical Clearance: N/A

Horizontal Clearance: 15.5' @ sta 8+99

Past Experience: Distortion, Edge or road deterioration, mild bleeding, rutting

Turning Radii: Varies from 4' to 80' Radii

Under Clearance: Adequate

Minimum Site Distance:

Vertical: Adequate

Horizontal: Adequate

Slope Gradient:

Minimum: - 7%

Maximum: + 1%



Daugherty Township Sight Distance Measurements

Road Name: Fourth Street

Vertical Sight Distance (VSD)

Station : N/A

VSD #1 : _____

Station : _____

VSD #2 : _____

Station : _____

VSD #3 : _____

Station : _____

VSD #4 : _____

Horizontal Sight Distance (HSD)

Station : N/A

HSD #1 : _____

Station : _____

HSD #2 : _____

Station : _____

HSD #3 : _____

Station : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance Calculated (ft)	Stopping sight distance Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Fourth Street

Inspected Date: November 12, 2008

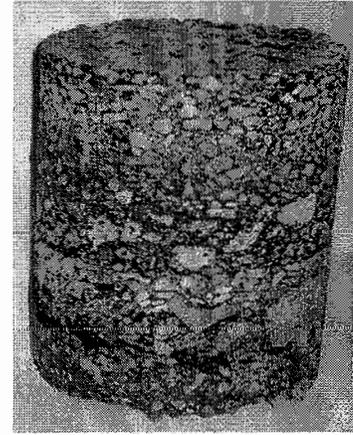
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation	X		
2 Distortion	X		
3 Surface Deterioration		X	
4 Rutting	X		
5 Potholes			
6 Bleeding	X		
7 Loose Chips			

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Fourth Street T-321
Pavement Core #23



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	1"	x	0	=	0
Bituminous Wearing Course (FB)	1 1/2"	x	0.42	=	0.63
Crushed Aggregate (Slag)	6 1/2"	x	0.14	=	0.91
					<hr/> 1.54

Core Sample taken @ station 1+52

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					<hr/> 4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Fourth Street T-321

Main Avenue

T - 8 4 5

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Main Avenue

T. R. No.: 845

From: S.R. 65

To: End of Road

Posted Speed Limit: 25 mph

ADT: 1000±

Total Length of Road (Ft.): 2,850

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 4 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other:

Traffic Generators – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:

Coal Stripping Mining

Shopping Mall

Quarry Operation

Timber Harvesting Operation

Warehouse

Trucking Terminal

Other

BRIDGE RESTRICTIONS:

General – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.

Structural Analyses.

The bridge is not designed for AASHTO 20 loading.

The bridge has been damaged by fire, accident or environmental deterioration.

Engineering calculations indicate overstressing of members when subject to maximum legal loads.

Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Main Avenue.

Field Inspection Conducted on September 8, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Main Avenue

T. R. No.: 845

From: S.R. 65

To: End of Road

Posted Speed Limit: 25 mph

ADT: ± 1000

Posted Weight Limit: N/A

Surface Type/Depth: Tar & Chip (4")

Base Course/Depth: FB Binder (2 ½")
Crushed Sandstone (5")

Width of Surface: 22' @ station 2+33
20' @ station 8+78

Shoulder Width/Type: 3'/Dirt & Gravel

Vertical Clearance: N/A

Horizontal Clearance: 26' between fence and stone wall

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: Varies 5' to 20' Radii

Under Clearance: Adequate

Minimum Site Distance:

Vertical: Adequate

Horizontal: Adequate

Slope Gradient:

Minimum: (-10%) @ sta 14+90

Maximum: (+11%) @ sta 2+33



Daugherty Township Sight Distance Measurements

Road Name: Main Avenue

Vertical Sight Distance (VSD)

Station : 4+73

VSD #1 : 276

Station : 12+92

VSD #2 : 245

Station : _____

VSD #3 : _____

Station : _____

VSD #4 : _____

Horizontal Sight Distance (HSD)

Station : 25+16

HSD #1 : 162

Station : _____

HSD #2 : _____

Station : _____

HSD #3 : _____

Station : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Main Avenue

Inspected Date: November 12, 2008

DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation	X		
2 Distortion		X	
3 Surface Deterioration	X		
4 Rutting	X		
5 Potholes	X		
6 Bleeding	X		
7 Loose Chips			

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Main Avenue T-845
Pavement Core #3



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	4"	x	0	=	0
Bituminous Binder Course (FB)	2 1/2"	x	0.4	=	1
Crushed Sandstone Aggregate	5"	x	0.14	=	0.7
					1.7

Core Sample taken @ station 8+78

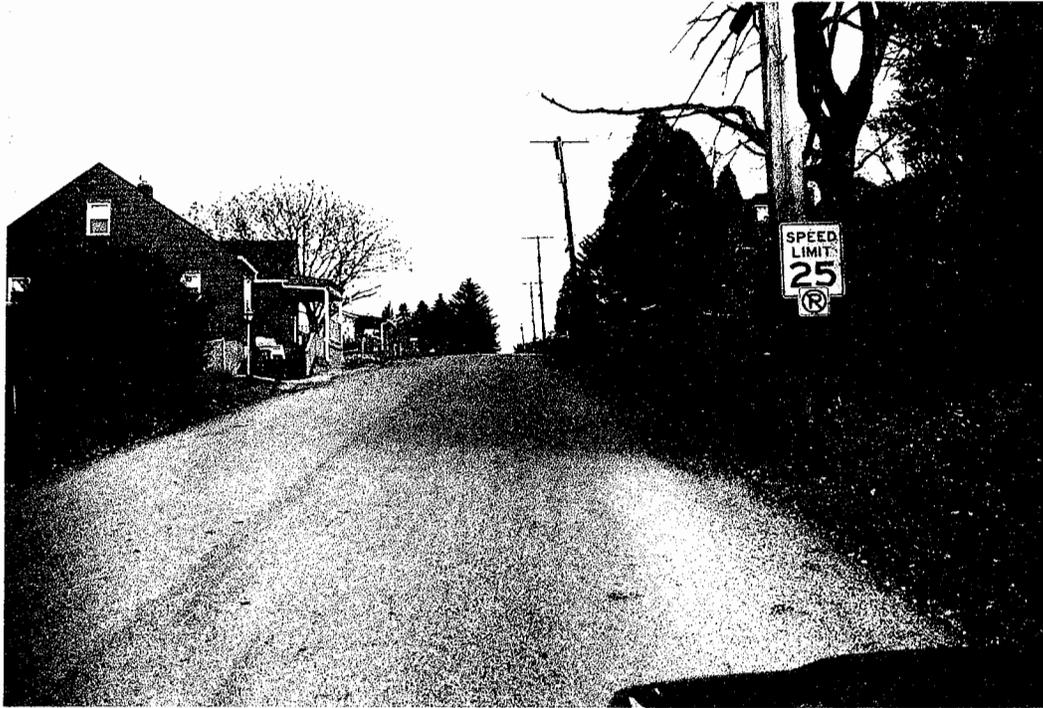
Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
Minimum Required Structural No.					4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Main Avenue T-845

Florence Road

T - 4 3 4

DANIEL C. BAKER ASSOCIATES, INC.

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SURVEYORS AND PLANNERS

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FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Florence Road

T. R. No.: 434

From: Main Avenue

To: Ridgevue Road

Posted Speed Limit: No

ADT: 1000±

Total Length of Road (Ft.): 2,370

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 3 Inches

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: Yes

Other:

Traffic Generators – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:

Coal Stripping Mining

Shopping Mall

Quarry Operation

Timber Harvesting Operation

Warehouse

Trucking Terminal

Other

BRIDGE RESTRICTIONS:

General – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.

Structural Analyses.

The bridge is not designed for AASHTO 20 loading.

The bridge has been damaged by fire, accident or environmental deterioration.

Engineering calculations indicate overstressing of members when subject to maximum legal loads.

Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Florence Road.

Field Inspection Conducted on September 8, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552
(724) 495-7020 FAX: (724) 495-2594
E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Florence Road

T. R. No.: T-434

From: Main Avenue

To: End

Posted Speed Limit: None

ADT: ± 1000

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (3")

Base Course/Depth: Slag (6")

Width of Surface: 21' @ sta 641
23' @ sta 1823

Shoulder Width/Type: 3'/Gravel and Dirt

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: 20' Radii

Under Clearance: Adequate

Minimum Site Distance:

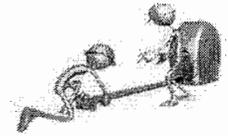
Vertical: 202' @ sta 14+73, 241' @ sta 21+96

Horizontal: Adequate

Slope Gradient:

Minimum: (-7%) @ sta 18+23

Maximum: (6%) @ sta 7+80



Daugherty Township Sight Distance Measurements

Road Name: Florence Road

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 14+73

Station : _____

VSD #1 : 202

HSD #1 : _____

Station : 21+96

Station : _____

VSD #2 : 241

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Florence Road

Inspected Date: November 12, 2008

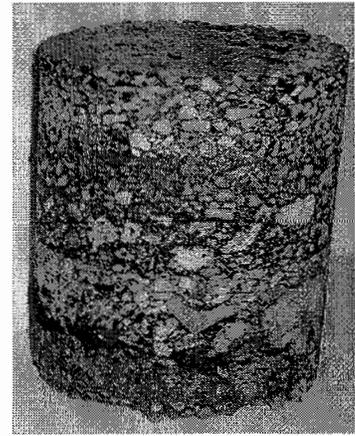
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation	X		
2 Distortion		X	
3 Surface Deterioration		X	
4 Rutting			
5 Potholes			
6 Bleeding	X		
7 Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Florence Road T-434
Pavement Core #4



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	3"	x	0	=	0
Crushed Aggregate Slag Base	6"	x	0.14	=	0.84
					0.84

Core Sample taken @ station 6+41

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Blinder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
Minimum Required Structural No.					4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Florence Road T-434

McGuire Street

T - 8 2 9

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: McGuire Street

T. R. No.: 829

From: Stuber Road

To: Stuber Road

Posted Speed Limit: No

ADT: 25±

Total Length of Road (Ft.): 2,222

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 3 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: Yes

Other: Narrow road width

Traffic Generators – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:

Coal Stripping Mining

Shopping Mall

Quarry Operation

Timber Harvesting Operation

Warehouse

Trucking Terminal

Other

BRIDGE RESTRICTIONS:

General – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.

Structural Analyses.

The bridge is not designed for AASHTO 20 loading.

The bridge has been damaged by fire, accident or environmental deterioration.

Engineering calculations indicate overstressing of members when subject to maximum legal loads.

Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on McGuire Street.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

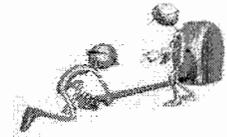
Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008



Daugherty Township Sight Distance Measurements

Road Name: McGuire Street

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 11+15

Station : _____

VSD #1 : 93

HSD #1 : _____

Station : _____

Station : _____

VSD #2 : _____

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: McGuire Street

Inspected Date: November 12, 2008

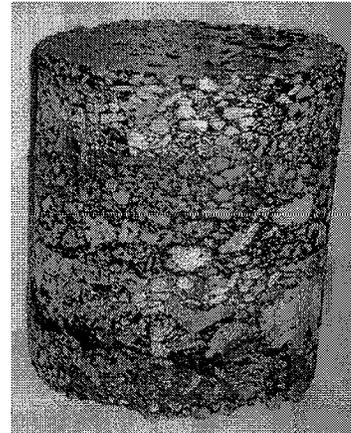
	DISTRESS TYPE	LOW	MEDIUM	HIGH
1	Corrugation			
2	Distortion	X		
3	Surface Deterioration	X		
4	Rutting			
5	Potholes			
6	Bleeding	X		
7	Loose Chips			X

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

McGuire Street T-829
Pavement Core #21



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	3"	x	0	=	0
Crushed Aggregate	5"	x	0.14	=	0.70
					0.70

Core Sample taken @ station 3+94

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



McGuire Street T-829

Stuber Road

T - 5 4 2

DANIEL C. BAKER ASSOCIATES, INC.

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Stuber Road

T. R. No.: 542

From: S.R. 65

To: North Sewickley Township

Posted Speed Limit: 35 mph

ADT: 2500±

Total Length of Road (Ft.): 7,200

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 2.5 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other:

- Traffic Generators** - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township remove existing 10 ton weight limit and post a 7.5 ton limit on Stuber Road.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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SURVEYORS AND PLANNERS

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FAX: (724) 495-2594

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WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Core # 1

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Stuber Road

T. R. No.: 542

From: S.R. 65

To: North Sewickley Township Line

Posted Speed Limit: 35 mph

ADT: ±2500

Posted Weight Limit: 10 Ton

Surface Type/Depth: Tar & Chip (4")

Base Course/Depth: Slag (4")

Width of Surface: 20.5 @ sta 40+59
23' @ sta 57+94

Shoulder Width/Type: Varies 0' to 4'/Dirt &
Gravel

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: 5' Radii at side streets

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 113' @ sta 7+68, 181' @ sta 20+09, 228' @ sta 38+94, 162' @ sta 51+93, 104' @ sta
75+98

Horizontal: 153' @ sta 29+34, 158' @ sta 58+57

Slope Gradient:

Minimum: -8% @ sta 15+93

Maximum: +14% @ sta 5+63

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020 FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Core # 2

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Stuber Road

T. R. No.: 542

From: S.R. 65

To: North Sewickley Township Line

Posted Speed Limit: 35 mph

ADT: ±2500

Posted Weight Limit: 10 Ton

Surface Type/Depth: Tar & Chip (2 ½ ")

Base Course/Depth: FB Binder (3")
Cement/Sandstone (5")

Width of Surface: 23 ½' @ sta 1 + 78

Shoulder Width/Type: Varies 0' to 4'/Dirt &
Gravel

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: 5' Radii at side streets

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 113' @ sta 7+68, 181' @ sta 20+09, 228' @ sta 38+94, 162' @ sta 51+93, 104' @ sta 75+98

Horizontal: 153' @ sta 29+34, 158' @ sta 58+57

Slope Gradient:

Minimum: -8% @ sta 15+93

Maximum: +14% @ sta 5+63



Daugherty Township Sight Distance Measurements

Road Name: Stuber Road

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 7+68

Station : 13+79

VSD #1 : 113

HSD #1 : 333

Station : 20+09

Station : 29+34

VSD #2 : 181

HSD #2 : 153

Station : 38+94

Station : 58+57

VSD #3 : 228

HSD #3 : 158

Station : 51+93

Station :

VSD #4 : 162

HSD #4 :

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Stuber Road

Inspected Date: November 12, 2008

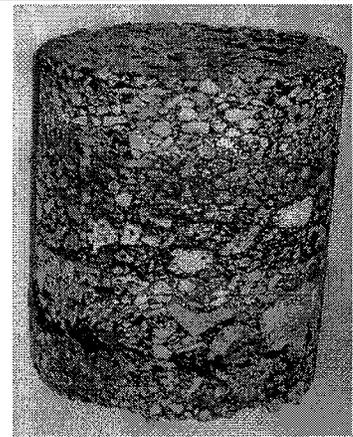
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation		X	
2 Distortion		X	
3 Surface Deterioration	X		
4 Rutting	X		
5 Potholes	X		
6 Bleeding		X	
7 Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Stuber Road T-542
Pavement Core #19



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	4"	x	0	=	0
Crushed Aggregate (Slag)	4"	x	0.14	=	0.56
					0.56

Core Sample taken @ station 57+94

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
			Minimum Required Structural No.	=	4.69

Daugherty Township

Structural Analysis Calculations

Stuber Road T-542
Pavement Core #22



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	2 1/2"	x	0	=	0
Bituminous Binder Course (FB)	3"	x	0.42	=	1.26
Cement-treated base (CTB)	5"	x	0.27	=	1.35
					<hr/> 2.61

Core Sample taken @ station 1+78

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					<hr/> 4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Stuber Road T-542

Nelson Avenue

T - 8 4 7

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

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FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Nelson Avenue

T. R. No.: 847

From: Stuber Road

To: Shanor Drive

Posted Speed Limit: No

ADT: 100±

Total Length of Road (Ft.): 1,467

HIGHWAY RESTRICTIONS:

- Geometric Review** – The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** – An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** – A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 2 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other:

Traffic Generators - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:

Coal Stripping Mining

Shopping Mall

Quarry Operation

Timber Harvesting Operation

Warehouse

Trucking Terminal

Other

BRIDGE RESTRICTIONS:

General - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.

Structural Analyses.

The bridge is not designed for AASHTO 20 loading.

The bridge has been damaged by fire, accident or environmental deterioration.

Engineering calculations indicate overstressing of members when subject to maximum legal loads.

Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Nelson Avenue.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Nelson Avenue

T. R. No.: 847

From: Stuber Road

To: Shanor Drive

Posted Speed Limit: None

ADT: ±100

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (2")

Base Course/Depth: Stone/Clay (2 ½")

Width of Surface: 19' @ sta 10+80

Shoulder Width/Type: 3' Dirt and Gravel

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: 15' Radii @ intersection with Shanor

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 123' @ station 4+03

Horizontal: Adequate

Slope Gradient:

Minimum: -10% @ sta 7+29

Maximum: +7% @ sta 5+25



Daugherty Township Sight Distance Measurements

Road Name: Nelson Avenue

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 4+03

Station : _____

VSD #1 : 123

HSD #1 : _____

Station : _____

Station : _____

VSD #2 : _____

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Nelson Avenue

Inspected Date: November 12, 2008

DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation			
2 Distortion	X		
3 Surface Deterioration	X		
4 Rutting			
5 Potholes			
6 Bleeding	X		
7 Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Nelson Avenue T-847
Pavement Core #20



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	2"	x	0	=	0
Crushed Aggregate (Poor Condition)	2 1/2"	x	0.11	=	0.275
					0.275

Core Sample taken @ station 10+80

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Nelson Avenue T-847

Hilton Drive

T - 8 4 6

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552
(724) 495-7020 FAX: (724) 495-2594
E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Hilton Drive

T. R. No.: 846

From: S.R. 65

To: Klein Road

Posted Speed Limit: 25 mph

ADT: 250±

Total Length of Road (Ft.): 1,281

HIGHWAY RESTRICTIONS:

- Geometric Review** – The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** – An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** – A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 4 ½ Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: No

Other:

- Traffic Generators** – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
- The bridge has been damaged by fire, accident or environmental deterioration.
- Engineering calculations indicate overstressing of members when subject to maximum legal loads.
- Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Hilton Drive.

Field Inspection Conducted on September 8, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

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FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Hilton Drive

T. R. No.: T-846

From: S.R. 65

To: Klein Road

Posted Speed Limit: 25 mph

ADT: 250±

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (4 ½")

Base Course/Depth: Stone (5")

Width of Surface: 21' @ sta 4+23

Shoulder Width/Type: N/A

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: 12' Radii @ intersection with S.R. 65

Under Clearance: Adequate

Minimum Site Distance:

Vertical: Adequate

Horizontal: Adequate

Slope Gradient:

Minimum: -14% @ sta 73

Maximum: +10 @ sta 11+92



Daugherty Township Sight Distance Measurements

Road Name: Hilton Drive

Vertical Sight Distance (VSD)

Station : _____

VSD #1 : _____

Station : _____

VSD #2 : _____

Station : _____

VSD #3 : _____

Station : _____

VSD #4 : _____

Horizontal Sight Distance (HSD)

Station : 8+41

HSD #1 : 199

Station : _____

HSD #2 : _____

Station : _____

HSD #3 : _____

Station : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Hilton Drive

Inspected Date: November 12, 2008

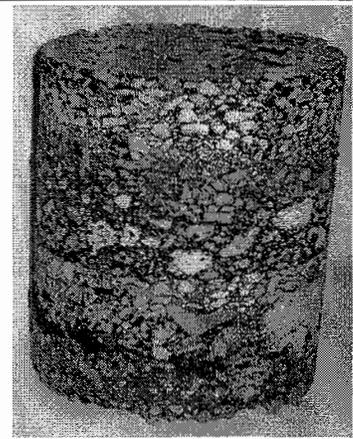
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation			
2 Distortion		X	
3 Surface Deterioration	X		
4 Rutting			
5 Potholes			
6 Bleeding	X		
7 Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1" < 1" < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Hilton Drive T-846
Pavement Core #1



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	4 1/2"	x	0	=	0
Crushed Aggregate Base	5"	x	0.14	=	0.70
					<u>0.70</u>

Core Sample taken @ station 4+23

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	<u>0.33</u>
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Hilton Drive T-846

Klein Road

T - 8 2 5

DANIEL C. BAKER ASSOCIATES, INC.

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Klein Road

T. R. No.: 825

From: Wisers Grove Road

To: Hilton Drive

Posted Speed Limit: 25 mph

ADT: 250±

Total Length of Road (Ft.): 2,750

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 3 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: No

Other: Excessive loading causing base failure on eastern side of road surface near station 9+00

- Traffic Generators** - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Klein Road.

Field Inspection Conducted on September 8, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Klein Road

T. R. No.: 825

From: Wise's Grove Road

To: Cul-de-Sac

Posted Speed Limit: 25 mph

ADT: 250±

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (3")

Base Course/Depth: Slag/Sandstone (7")

Width of Surface: 23' @ sta 2+23
19' @ sta 21+50

Shoulder Width/Type: N/A

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: ±20' Radii @ Wise's Grove Road

Under Clearance: Adequate

Minimum Site Distance:

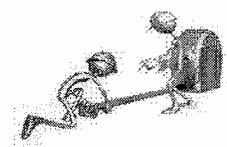
Vertical: 141' @ sta 22+25

Horizontal: Adequate

Slope Gradient:

Minimum: -7% @ sta 20+05

Maximum: 8% @ sta 1+00



Daugherty Township Sight Distance Measurements

Road Name: Klein Road

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 13+48

Station : _____

VSD #1 : 231

HSD #1 : _____

Station : 22+25

Station : _____

VSD #2 : 141

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.



Daugherty Township Sight Distance Measurements

Road Name: Klein Road

Vertical Sight Distance (VSD)

Station : ⁺1348

VSD #1 : 231

Station : ⁺2225

VSD #2 : 141

Station :

VSD #3 :

Station :

VSD #4 :

Horizontal Sight Distance (HSD)

Station :

HSD #1 :

Station :

HSD #2 :

Station :

HSD #3 :

Station :

HSD #4 :

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Klein Road

Inspected Date: November 12, 2008

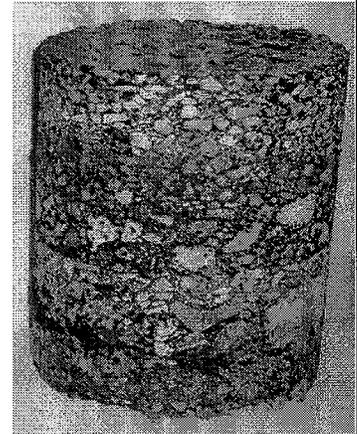
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation			
2 Distortion		X	
3 Surface Deterioration		X	
4 Rutting	X		
5 Potholes	X		
6 Bleeding	X		
7 Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Klein Road T-825
Pavement Core #2



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	3"	x	0	=	0
Crushed Sandstone/Slag	7"	x	0.14	=	0.98
					0.98

Core Sample taken @ station 11+80

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
Minimum Required Structural No.					4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Klein Road T-825

Franklin Road

T - 8 2 0

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020 FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Franklin Road

T. R. No.: 820

From: S.R. 65

To: Scott Street

Posted Speed Limit: No

ADT: 200±

Total Length of Road (Ft.): 1,158

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 4 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: N/A

Other:

- Traffic Generators** - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Franklin Road.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Franklin Road

T. R. No.: 850

From: S.R. 65

To: Scott Street

Posted Speed Limit: None

ADT: ±200

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (4")

Base Course/Depth: Aggregate AASHTO # 1
(8")

Width of Surface: 19' @ sta 10+77
22' @ sta 3+15

Shoulder Width/Type: N/A

Vertical Clearance: Adequate

Horizontal Clearance: 26' @ sta 6+90

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: 15' Radii @ intersection with S.R. 65

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 191' @ sta 6+39

Horizontal: Adequate

Slope Gradient:

Minimum: -14% @ sta 7+84

Maximum: 11% @ sta 1+24



Daugherty Township Sight Distance Measurements

Road Name: Franklin Road

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 6+39

Station : N/A

VSD #1 : 191

HSD #1 : _____

Station : _____

Station : _____

VSD #2 : _____

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Franklin Road

Inspected Date: November 12, 2008

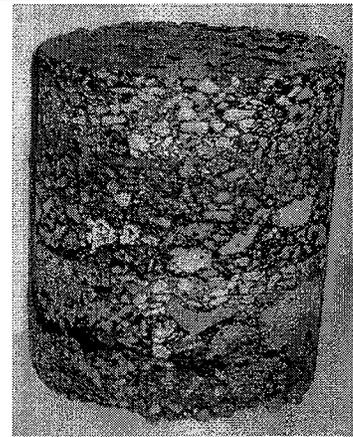
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation			
2 Distortion	X		
3 Surface Deterioration	X		
4 Rutting	X		
5 Potholes	X		
6 Bleeding	X		
7 Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Franklin Road T-850
Pavement Core #24



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	4"	x	0	=	0
Crushed Aggregate (PennDOT #4)	8"	x	0.14	=	1.12
					<u>1.12</u>

Core Sample taken @ station 3+15

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	<u>0.33</u>
			Minimum Required Structural No.	=	<u>4.69</u>

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Franklin Road T-850

**Silver Spring
Road**

T - 5 8 5

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Silver Spring Road

T. R. No.: 585

From: Blockhouse Run Road

To: Dogwood Drive

Posted Speed Limit: No

ADT: 100±

Total Length of Road (Ft.): 5,341

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 5 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other:

- Traffic Generators** - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Silver Spring Road.

Field Inspection Conducted on September 9, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552
(724) 495-7020 FAX: (724) 495-2594
E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Core # 1

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Silver Spring Road

T. R. No.: 585

From: Blockhouse Run Road

To: Dogwood Drive

Posted Speed Limit: None

ADT: ±100

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (5")

Base Course/Depth: Slag (7")

Width of Surface: 18' @ sta 47+41

Shoulder Width/Type: 3'/Gravel & Dirt

Vertical Clearance: Adequate

Horizontal Clearance: 25' Tree and Bottom Hillside

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing

Turning Radii: 25' @ intersection Dogwood Drive

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 197' @ sta 15+36, 213' @ sta 24+40, 173' @ sta 38+42, 155' @ sta 42+57

Horizontal: 202' @ sta 31+73

Slope Gradient:

Minimum: -14% @ sta 1+10

Maximum: 14% @ sta 52+21

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

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(724) 495-7020 FAX: (724) 495-2594
E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Core # 2

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Silver Spring Road

T. R. No.: 585

From: Blockhouse Run Road

To: Dogwood Drive

Posted Speed Limit: None

ADT: ±100

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (3")

Base Course/Depth: Aggregate AASHTO # 1
(10")

Width of Surface: 18' @ sta 10+30

Shoulder Width/Type: 3'/Gravel & Dirt

Vertical Clearance: Adequate

Horizontal Clearance: 25' Between Tree and Bottom of Hillside

Past Experience: No major reconstruction required on road but excessive loads and climatic conditions causing pavement fatiguing

Turning Radii: 25' @ intersection Dogwood Drive

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 197' @ sta 15+36, 213' @ sta 24+40, 173' @ sta 38+42, 155' @ sta 42+57

Horizontal: 202' @ sta 31+73

Slope Gradient:

Minimum: -14% @ sta 1+10

Maximum: 14% @ sta 52+21



Daugherty Township Sight Distance Measurements

Road Name: Silver Spring Road

Vertical Sight Distance (VSD)

Station : 15+36

VSD #1 : 197

Station : 24+40

VSD #2 : 213

Station : 38+42

VSD #3 : 173

Station : 42+57

VSD #4 : 155

Horizontal Sight Distance (HSD)

Station : 31+73

HSD #1 : 202

Station : _____

HSD #2 : _____

Station : _____

HSD #3 : _____

Station : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Silver Spring Road

Inspected Date: November 12, 2008

DISTRESS TYPE	SEVERITY		
	LOW	MEDIUM	HIGH
1 Corrugation			
2 Distortion	X		
3 Surface Deterioration	X		
4 Rutting	X		
5 Potholes			
6 Bleeding	X		
7 Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Silver Spring Road T-585
Pavement Core #9



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	5"	x	0	=	0
Crushed Aggregate (Slag)	7"	x	0.14	=	0.98
					<u>0.98</u>

Core Sample taken @ station 47+41

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	<u>0.33</u>
			Minimum Required Structural No.	=	4.69

Daugherty Township

Structural Analysis Calculations

Silver Spring Road T-585
Pavement Core #10



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	3"	x	0	=	0
Crushed Aggregate AASHTO #1/Pa #4	10"	x	0.14	=	1.4
					<hr/> 1.4

Core Sample taken @ station 10+30

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					<hr/> 4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Silver Spring Road T-585

Frishkorn Road

T - 5 7 1

DANIEL C. BAKER ASSOCIATES, INC.

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Frishkorn Road

T. R. No.: 571

From: Blockhouse Run Road

To: Cul-de-Sac

Posted Speed Limit: No

ADT: 50±

Total Length of Road (Ft.): 3,354

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 2 Inch

General Condition: Poor

Adequacy of Drainage: Poor

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other: Existing temporary stream crossing near intersection with Blockhouse Run Road will be replaced with a metal bridge. The metal bridge will have a horizontal clearance of 16 feet from face to face.

- Traffic Generators** - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
- The bridge has been damaged by fire, accident or environmental deterioration.
- Engineering calculations indicate overstressing of members when subject to maximum legal loads.
- Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Frishkorn Road.

Field Inspection Conducted on September 9, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Frishkorn Road

T. R. No.: 571

From: Blockhouse Run Road

To: Cul-de-Sac

Posted Speed Limit: None

ADT: ±50

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (2")

Base Course/Depth: Pottery (6")

Width of Surface: 14' @ sta 17+77

Shoulder Width/Type: 3'/Dirt & Stone

Vertical Clearance: 14' @ sta 28+63

Horizontal Clearance: 16' @ Bridge crossing

Past Experience: Intersection from Blockhouse Run Road to approximately sta 8+00 base course was reconstructed with 8 inches of reclaim material. Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: Narrow turning area at end of Cul-de-Sac

Under Clearance: Adequate

Minimum Site Distance:

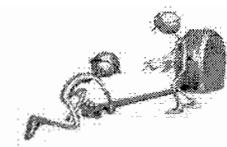
Vertical: Adequate

Horizontal: 218' @ sta 13+59

Slope Gradient:

Minimum: -1% @ sta 33+00

Maximum: +11% @ sta 28+63



Daugherty Township Sight Distance Measurements

Road Name: Frishkorn Road

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : _____

Station : 1359

VSD #1 : _____

HSD #1 : 218

Station : _____

Station : _____

VSD #2 : _____

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Frishkorn Road

Inspected Date: November 12, 2008

DISTRESS TYPE		LOW	MEDIUM	HIGH
1	Corrugation			X
2	Distortion			X
3	Surface Deterioration			X
4	Rutting		X	
5	Potholes		X	
6	Bleeding	X		
7	Loose Chips		X	

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Frishkorn Road T-571
Pavement Core #11



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	2"	x	0	=	0
Crushed Pottery	6"	x	0.10	=	0.6
					<u>0.6</u>

Core Sample taken @ station 17+77

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	<u>0.33</u>
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Frishkorn Road T-571

Goehring Road

T - 8 4 9

DANIEL C. BAKER ASSOCIATES, INC.

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Goehring Road

T. R. No.: 849

From: Harmony Road

To: Tulip Drive

Posted Speed Limit: 25 mph

ADT: 2500±

Total Length of Road (Ft.): 3,492

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 5 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: No

Other:

- Traffic Generators** – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
- The bridge has been damaged by fire, accident or environmental deterioration.
- Engineering calculations indicate overstressing of members when subject to maximum legal loads.
- Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 10 ton weight limit on Goehring Road.

Field Inspection Conducted on September 9, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

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WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Core # 1

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Goehring Road

T. R. No.: 849

From: Harmony Road

To: Tulip Drive

Posted Speed Limit: 25 mph

ADT: ±2500

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (1.5")

Base Course/Depth: Reclaim AC (10")

Width of Surface: 22' @ sta 25+21

Shoulder Width/Type: 3'/Dirt & Stone

Vertical Clearance: Low utility wires @ sta 2+50

Horizontal Clearance: Adequate

Past Experience: 10 years ago various section reconstruction with 8 inch reclaim asphalt. Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: 30' Radii @ intersection with Tulip Drive

Under Clearance: Adequate

Minimum Site Distance:

Vertical: Adequate

Horizontal: Adequate

Slope Gradient:

Minimum: -14%

Maximum: +8%

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552
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E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Core # 2

Municipality: Daugherty Township **County:** Beaver
Road/Street Name: Goehring Road **T. R. No.:** 849
From: Harmony Road **To:** Tulip Drive
Posted Speed Limit: 25 mph **ADT:** ±2500
Posted Weight Limit: None
Surface Type/Depth: Tar & Chip (5") **Base Course/Depth:** Stone & Reclaim (7")
Width of Surface: 22' @ sta 8+93 **Shoulder Width/Type:** 3'/Dirt & Stone
Vertical Clearance: Low utility wires @ sta 2+50
Horizontal Clearance: Adequate
Past Experience: 10 years ago various section reconstruction with 8 inch reclaim asphalt.
Excessive load weights and climatic conditions causing pavement fatiguing.
Turning Radii: 30' Radii @ intersection with Tulip Drive
Under Clearance: Adequate
Minimum Site Distance:
Vertical: Adequate
Horizontal: Adequate
Slope Gradient:
Minimum: -14%
Maximum: +8%

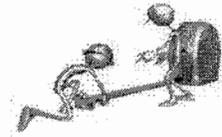
Surface Chip Seal

Road Name: Goehring Road

Inspected Date: November 12, 2008

DISTRESS TYPE		LOW	MEDIUM	HIGH
1	Corrugation			
2	Distortion	X		
3	Surface Deterioration	X		
4	Rutting	X		
5	Potholes			
6	Bleeding	X		
7	Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface



Daugherty Township Sight Distance Measurements

Road Name: Goehring Road

Vertical Sight Distance (VSD)

Station : 26+05

VSD #1 : 241'

Station : _____

VSD #2 : _____

Station : _____

VSD #3 : _____

Station : _____

VSD #4 : _____

Horizontal Sight Distance (HSD)

Station : 11+12

HSD #1 : 251'

Station : 30+36

HSD #2 : 192

Station : _____

HSD #3 : _____

Station : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Daugherty Township

Structural Analysis Calculations

Goehring Road T-849
Pavement Core #7



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	1 1/2"	x	0	=	0
Recycled AC	10"	x	0.42	=	4.2
					4.2

Core Sample taken @ station 25+21

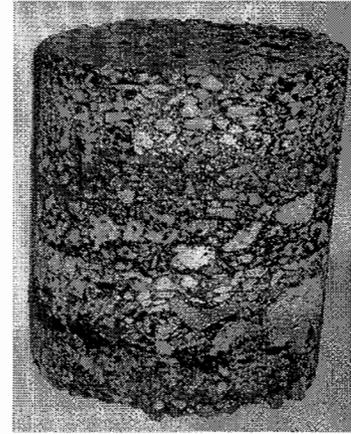
Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Structural Analysis Calculations

Goehring Road T-849
Pavement Core #8



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	5"	x	0	=	0
Recycled AC	7"	x	0.42	=	2.94
					2.94

Core Sample taken @ station 8+93

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Goehring Road T-849

Drushel Road

T - 5 6 3

DANIEL C. BAKER ASSOCIATES, INC.

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6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

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FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Drushel Road

T. R. No.: 563

From: Tulip Drive

To: New Sewickley Township Line

Posted Speed Limit: No

ADT: 50±

Total Length of Road (Ft.): 3,178

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 2.5 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other:

- Traffic Generators** - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Drushel Road.

Field Inspection Conducted on September 8, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD . BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Drushel Road

T. R. No.: 563

From: Tulip Drive

To: New Sewickley Township Line

Posted Speed Limit: None

ADT: 50±

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (2.5")

Base Course/Depth: Reclaim AC/Slag (6.5")

Width of Surface: 18.5' @ sta 17+27
16' @ sta 1+12

Shoulder Width/Type: 3'/Dirt & Stone

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: 10 – 15 years ago place 8" to 10" reclaim at various sections. Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: 75' @ intersection with Tulip Drive

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 179' @ sta 11+27, 3+25 @ sta 20+75

Horizontal: Adequate

Slope Gradient:

Minimum: -14% @ sta 12+97

Maximum: 15% @ sta 8+20



Daugherty Township Sight Distance Measurements

Road Name: Drushel Road

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 11+27

Station : _____

VSD #1 : 179

HSD #1 : _____

Station : 20+75

Station : _____

VSD #2 : 325

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Drushel Road

Inspected Date: November 12, 2008

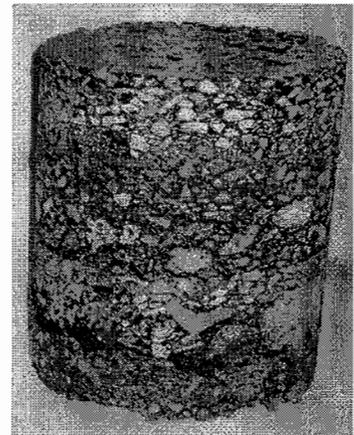
DISTRESS TYPE		LOW	MEDIUM	HIGH
1	Corrugation			
2	Distortion	X		
3	Surface Deterioration	X		
4	Rutting	X		
5	Potholes			
6	Bleeding	X		
7	Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Drushel Road T-563
Pavement Core #6



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	2.5"	x	0	=	0
Recycled AC	6.5	x	0.42	=	2.73
					<hr/> 2.73

Core Sample taken @ station 17+27

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					<hr/>
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Drushel Road T-563

Helbling Road

T - 5 6 7

DANIEL C. BAKER ASSOCIATES, INC.

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Helbling Road

T. R. No.: 567

From: Tulip Drive

To: New Sewickley Township Line

Posted Speed Limit: No

ADT: 50±

Total Length of Road (Ft.): 2,805

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 3 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: Yes

Other:

- Traffic Generators** – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Helbling Road.

Field Inspection Conducted on September 8, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020 FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Helbling Road

T. R. No.: 567

From: Tulip Drive

To: New Sewickley Township Line

Posted Speed Limit: None

ADT: 50±

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (3")

Base Course/Depth: Slag 3B (5")

Width of Surface: 19' @ sta 8+75

Shoulder Width/Type: 3'/Dirt & Gravel

Vertical Clearance: 18' @ sta 28+05 Township line

Horizontal Clearance: 26' between earth bank and earth bank

Past Experience: 10 – 15 years ago place 8" to 10" reclaim at various locations. Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: 25' @ intersection with Tulip Drive

Under Clearance: Adequate

Minimum Site Distance:

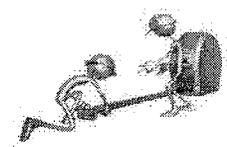
Vertical: 189' @ sta 14+85, 159' @ sta 22+95

Horizontal: Adequate

Slope Gradient:

Minimum: +8% @ sta 0+25

Maximum: -20% @ sta 17+72



Daugherty Township Sight Distance Measurements

Road Name: Helbling Road

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 14+85

Station : _____

VSD #1 : 189'

HSD #1 : _____

Station : 22+95

Station : _____

VSD #2 : 159'

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Helbling Road

Inspected Date: November 12, 2008

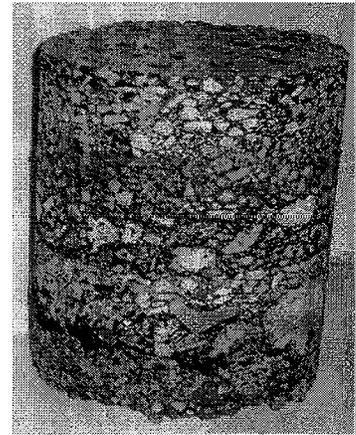
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation	X		
2 Distortion	X		
3 Surface Deterioration	X		
4 Rutting			
5 Potholes			
6 Bleeding		X	
7 Loose Chips		X	

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Helbling Road T-567
Pavement Core #5



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	3"	x	0	=	0
Crushed Stone (3B Slag)	5"	x	0.14	=	0.7
					0.7

Core Sample taken @ station 8+75

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Helbling Road T-567

Inman Road

T - 8 3 1

DANIEL C. BAKER ASSOCIATES, INC.

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SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

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FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Inman Road

T. R. No.: 831

From: S.R. 68

To: Hogue Drive

Posted Speed Limit: No

ADT: 100±

Total Length of Road (Ft.): 1,710

HIGHWAY RESTRICTIONS:

- Geometric Review** – The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** – An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** – A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 3.5 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: Yes

Other:

Traffic Generators - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:

Coal Stripping Mining

Shopping Mall

Quarry Operation

Timber Harvesting Operation

Warehouse

Trucking Terminal

Other

BRIDGE RESTRICTIONS:

General - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.

Structural Analyses.

The bridge is not designed for AASHTO 20 loading.

The bridge has been damaged by fire, accident or environmental deterioration.

Engineering calculations indicate overstressing of members when subject to maximum legal loads.

Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Inman Road.

Field Inspection Conducted on September 9, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Inman Road

T. R. No.: 831

From: S.R. 68

To: Hogue Drive

Posted Speed Limit: None

ADT: ±100

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (3.5")

Base Course/Depth: 2A Limestone (6.5")

Width of Surface: 19' @ sta 10+95

Shoulder Width/Type: 3'/Dirt & Stone

Vertical Clearance: Adequate

Horizontal Clearance: 25' @ sta 11+10

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: 15' Radii @ intersection with S.R. 68

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 215' @ sta 2+39, 188' @ sta 6+12

Horizontal: Adequate

Slope Gradient:

Minimum: -15% @ sta 7+95

Maximum: +8% @ sta 0+87



Daugherty Township Sight Distance Measurements

Road Name: Inman Road

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 2+39

Station : _____

VSD #1 : 215

HSD #1 : _____

Station : 6+12

Station : _____

VSD #2 : 188

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Inman Road

Inspected Date: November 12, 2008

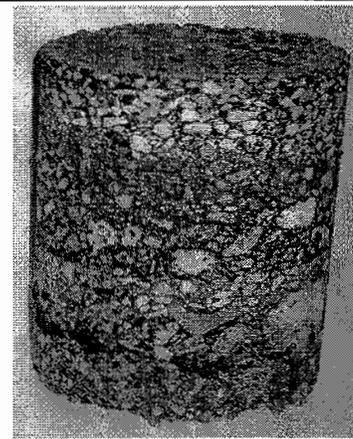
DISTRESS TYPE	LOW			MEDIUM			HIGH		
	1	2	3	4	5	6	7	8	9
Corrugation									
Distortion		X							
Surface Deterioration			X						
Rutting									
Potholes									
Bleeding				X					
Loose Chips						X			

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Inman Road T-831
Pavement Core #12



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	3 1/2"	x	0	=	0
Crushed Aggregate (PennDOT 2A)	6 1/2"	x	0.14	=	0.91
					0.91

Core Sample taken @ station 10+95

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14	=	1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					4.69
Minimum Required Structural No.				=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Inman Road T-831

Hogue Drive

T - 8 3 9

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

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FAX: (724) 495-2594

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Hogue Drive

T. R. No.: 839

From: East End of Hogue Drive

To: West end of Hogue Drive

Posted Speed Limit: No

ADT: 75±

Total Length of Road (Ft.): 519

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 3 Inch

General Condition: Poor

Adequacy of Drainage: Poor

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other:

- Traffic Generators** – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on Hogue Drive.

Field Inspection Conducted on September 9, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020 FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Hogue Drive

T. R. No.: 839

From: East end of Hogue Drive

To: West end of Hogue Drive

Posted Speed Limit: None

ADT: ±75

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (3")

Base Course/Depth: Slag (5")

Width of Surface: 14' @ sta 2+95

Shoulder Width/Type: 3'/Dirt & Stone

Vertical Clearance: Adequate

Horizontal Clearance: Pole and pine tree 20' clearance

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: Very limited turning area at the end and beginning of Hogue Drive

Under Clearance: Adequate

Minimum Site Distance:

Vertical: Adequate

Horizontal: Adequate

Slope Gradient:

Minimum: -8% @ sta 75

Maximum: -1% @ sta 4+20



Daugherty Township Sight Distance Measurements

Road Name: Hogue Drive

Vertical Sight Distance (VSD)

Station : N/A

VSD #1 : _____

Station : _____

VSD #2 : _____

Station : _____

VSD #3 : _____

Station : _____

VSD #4 : _____

Horizontal Sight Distance (HSD)

Station : N/A

HSD #1 : _____

Station : _____

HSD #2 : _____

Station : _____

HSD #3 : _____

Station : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Hogue Drive

Inspected Date: November 12, 2008

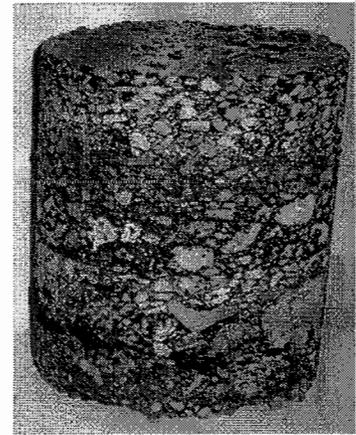
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation	X		
2 Distortion		X	
3 Surface Deterioration		X	
4 Rutting	X		
5 Potholes		X	
6 Bleeding			
7 Loose Chips		X	

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Hogue Drive T-839
Pavement Core #13



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	3"	x	0	=	0
Crushed Aggregate (Slag)	5"	x	0.14	=	0.70
					0.70

Core Sample taken @ station 2+95

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Hogue Drive T-839

Allendale Road

T - 5 5 3

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Allendale Road

T. R. No.: 553

From: Pittsburgh Road

To: Rochester Township Line

Posted Speed Limit: No

ADT: 400±

Total Length of Road (Ft.): 6,474

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 2 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other:

- Traffic Generators** – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 10 ton weight limit on Allendale Road.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

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E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Core # 1

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Allendale Road

T. R. No.: 553

From: Pittsburgh Road

To: Rochester Township Line

Posted Speed Limit: None

ADT: ±400

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (1 ½ ")

Base Course/Depth: FB wearing (1 ½ ")
FB binder (5")
Slag (12" ±)

Width of Surface: 18' @ sta 3+61

Shoulder Width/Type: 4'/Dirt & Stone

Vertical Clearance: Adequate

Horizontal Clearance: 25' minimum

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing.
High volume of truck traffic years past.

Turning Radii: 30' Radii near intersection with Pittsburgh Road

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 176' @ sta 5+21, 196' @ sta 15+71, 173' @ sta 25+15, 115' @ sta 45+00, 145' @ sta 54+04

Horizontal: 131' @ sta 17+41, 109' @ sta 32+61

Slope Gradient:

Minimum: -8% @ sta 6+20

Maximum: +14% @ sta 29+04

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

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(724) 495-7020 FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Core # 2

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Allendale Road

T. R. No.: 553

From: Pittsburgh Road

To: Rochester Township Line

Posted Speed Limit: None

ADT: ±400

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (2")

Base Course/Depth: FB wearing (1")
FB binder (5")
Limestone (5.5")
Crushed Pottery (.5")

Width of Surface: 17' @ sta 53+57

Shoulder Width/Type: 4'/Dirt & Limestone

Vertical Clearance: Adequate

Horizontal Clearance: 25' minimum

Past Experience: High volume of truck traffic years past. Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: 30' Radii near intersection with Pittsburgh Road

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 176' @ sta 5+21, 196' @ sta 15+71, 173' @ sta 25+15, 115' @ sta 45+00, 145' @ sta 54+04

Horizontal: 131' @ sta 17+41, 109' @ sta 32+61

Slope Gradient:

Minimum: -8% @ sta 6+20

Maximum: +14% @ sta 29+04



Daugherty Township Sight Distance Measurements

Road Name: Allendale Road

Vertical Sight Distance (VSD)

Station : 5+21

VSD #1 : 176

Station : 15+71

VSD #2 : 196

Station : 25+15

VSD #3 : (173)

Station : 45+00

VSD #4 : 115

Station : 54+04

VSD #5 : 145

Horizontal Sight Distance (HSD)

Station : 17+41

HSD #1 : 131

Station : 32+61

HSD #2 : 109

Station : _____

HSD #3 : _____

Station : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Allendale Road

Inspected Date: November 12, 2008

	DISTRESS TYPE	LOW	MEDIUM	HIGH
1	Corrugation	X		
2	Distortion	X		
3	Surface Deterioration		X	
4	Rutting	X		
5	Potholes			
6	Bleeding		X	
7	Loose Chips			

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Allendale Road T-553
Pavement Core #17



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	1 1/2"	x	0	=	0
Bituminous Wearing (FB)	1 1/2"	x	0.40	=	0.6
Bituminous Binder (FB)	5"	x	0.40	=	2.0
Crushed Aggregate	12"	x	0.14	=	1.68
					4.28

Core Sample taken @ station 3+61

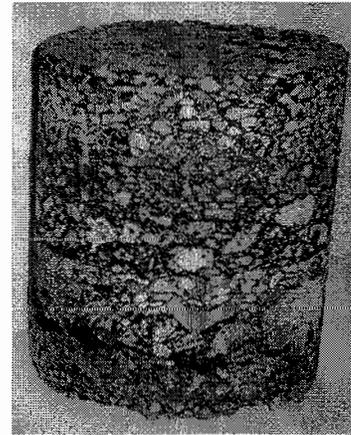
Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14	=	1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Structural Analysis Calculations

Allendale Road T-553
Pavement Core #18



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	2"	x	0	=	0
Bituminous Wearing (FB)	1"	x	0.40	=	0.40
Bituminous Binder (FB)	5"	x	0.40	=	2.0
Crushed Aggregate	5 1/2"	x	0.14	=	0.77
Crushed Pottery	1/2"	x	0.1	=	0.05
					3.22

Core Sample taken @ station 53+57

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14	=	1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
Minimum Required Structural No.					4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Allendale Road T-553

John Street

T - 8 1 8

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: John Street

T. R. No.: 818

From: Marion Hill Road

To: End of John Street

Posted Speed Limit: No

ADT: 75±

Total Length of Road (Ft.): 1,302

HIGHWAY RESTRICTIONS:

- Geometric Review** - The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** - An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** - A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 3 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: Yes

Shoulder Damage: Yes

Other:

- Traffic Generators** - One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** - The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
- The bridge has been damaged by fire, accident or environmental deterioration.
- Engineering calculations indicate overstressing of members when subject to maximum legal loads.
- Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 7.5 ton weight limit on John Street.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: John Street

T. R. No.: 818

From: Marion Hill Road

To: End

Posted Speed Limit: None

ADT: ±75

Posted Weight Limit: 7 Ton

Surface Type/Depth: Tar & Chip (3")

Base Course/Depth: Bituminous penetrating
oil & aggregate (1")
Sandstone (7")

Width of Surface: 16' @ sta 3+81

Shoulder Width/Type: 3'/Dirt and Gravel

Vertical Clearance: Adequate

Horizontal Clearance: 24' @ sta 3+50

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: 15' Radii @ intersection with Marion Hill Road

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 150' @ sta 11+01

Horizontal: Adequate

Slope Gradient:

Minimum: -5% @ sta 12+65

Maximum: 11% @ sta 925



Daugherty Township Sight Distance Measurements

Road Name: John Street

Vertical Sight Distance (VSD)

Station : 11+01

VSD #1 : 150

Station : _____

VSD #2 : _____

Station : _____

VSD #3 : _____

Station : _____

VSD #4 : _____

Horizontal Sight Distance (HSD)

Station : _____

HSD #1 : _____

Station : _____

HSD #2 : _____

Station : _____

HSD #3 : _____

Station : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: John Street

Inspected Date: November 12, 2008

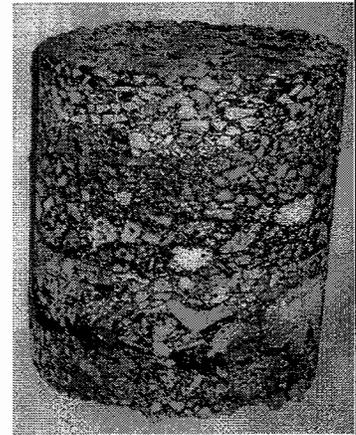
DISTRESS TYPE		LOW	MEDIUM	HIGH
1	Corrugation			
2	Distortion	X		
3	Surface Deterioration	X		
4	Rutting			
5	Potholes			
6	Bleeding	X		
7	Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

John Street T-818
Pavement Core #16



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	3"	x	0	=	0
Bituminous Penetrating Oil Aggregate Mixture	1"	x	0.30	=	0.30
Aggregate Base (Sandstone)	7"	x	0.14	=	0.98
				=	1.28

Core Sample taken @ station 3+81

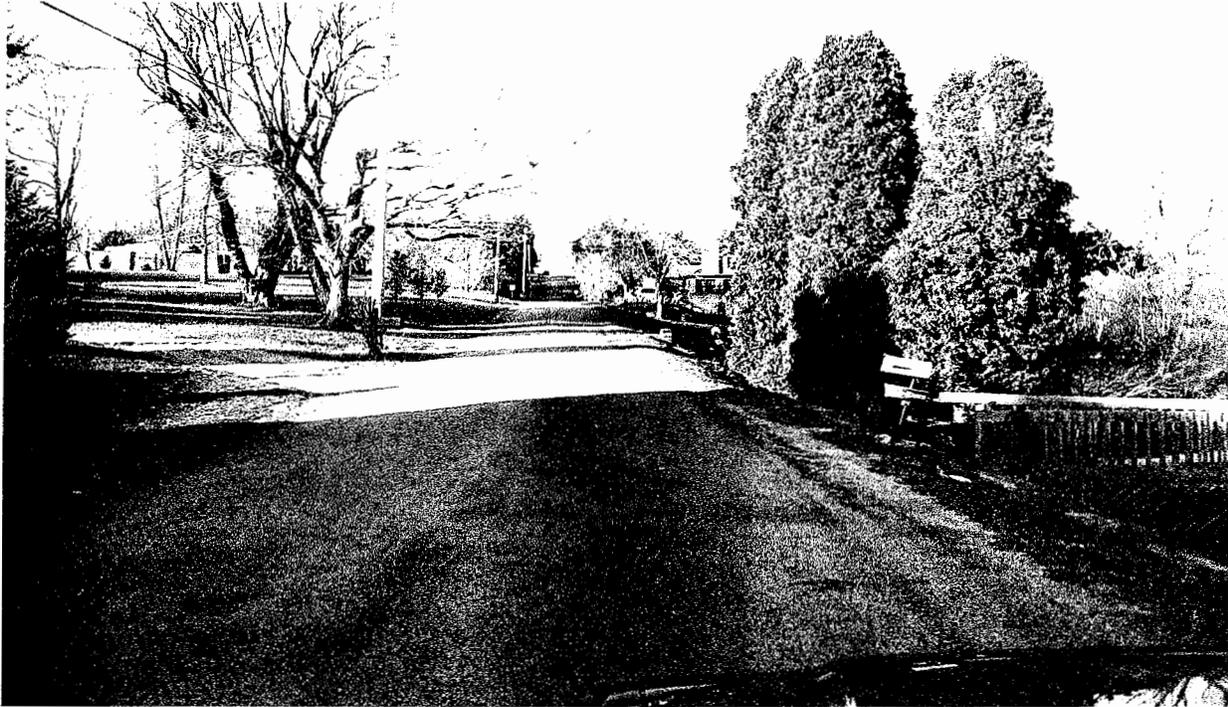
Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
				=	4.69
			Minimum Required Structural No.	=	4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



John Street T-818

Londonderry Drive

T - 8 5 9

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD

BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020

FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Londonderry Drive

T. R. No.: 859

From: Marion Hill Road

To: Drum Cliff Drive

Posted Speed Limit: 25 mph

ADT: 500±

Total Length of Road (Ft.): 2,478

HIGHWAY RESTRICTIONS:

- Geometric Review** – The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** – An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** – A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 2 Inch

General Condition: Good

Adequacy of Drainage: Good

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: No

Other:

Traffic Generators – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:

Coal Stripping Mining

Shopping Mall

Quarry Operation

Timber Harvesting Operation

Warehouse

Trucking Terminal

Other

BRIDGE RESTRICTIONS:

General – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.

Structural Analyses.

The bridge is not designed for AASHTO 20 loading.

The bridge has been damaged by fire, accident or environmental deterioration.

Engineering calculations indicate overstressing of members when subject to maximum legal loads.

Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, # 212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 10 ton weight limit on Londonderry Drive.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552
(724) 495-7020 FAX: (724) 495-2594
E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Londonderry Drive

T. R. No.: 859

From: Marion Hill Road

To: Drum Cliff Drive

Posted Speed Limit: 25 mph

ADT: ±500

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (2")

Base Course/Depth: Bituminous wearing (1 ½")
Bituminous binder (3 ½")
Limestone 2A (2")
PA # 4 (4")

Width of Surface: 22' @ sta 20+63

Shoulder Width/Type: N/A

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: 25' Radii @ intersection with Drum Cliff Drive

Under Clearance: Adequate

Minimum Site Distance:

Vertical: 190' @ sta 15+35

Horizontal: Adequate

Slope Gradient:

Minimum: -5% @ sta 17+10

Maximum: 11% @ sta 23+75



Daugherty Township Sight Distance Measurements

Road Name: Londonderry Drive

Vertical Sight Distance (VSD)

Station : 15+35

VSD #1 : 190

Station :

VSD #2 :

Station :

VSD #3 :

Station :

VSD #4 :

Horizontal Sight Distance (HSD)

Station :

HSD #1 :

Station :

HSD #2 :

Station :

HSD #3 :

Station :

HSD #4 :

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance	
			Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Londonderry Drive

Inspected Date: November 12, 2008

	DISTRESS TYPE	LOW	MEDIUM	HIGH
1	Corrugation			
2	Distortion	X		
3	Surface Deterioration	X		
4	Rutting			
5	Potholes			
6	Bleeding	X		
7	Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Londonderry Drive T-859
Pavement Core #15



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	2"	x	0	=	0
Bituminous Wearing Course (FB)	1 1/2"	x	0.42	=	0.63
Bituminous Binder Course (FB)	3 1/2"	x	0.42	=	1.47
Crushed Aggregate (PennDOT 2A)	2"	x	0.14	=	0.28
Crushed Aggregate (PennDOT #4)	4"	x	0.14	=	0.56
					2.94

Core Sample taken @ station 20+63

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14		1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
Minimum Required Structural No.					4.69

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Londonderry Drive T-859

Drum Cliff Drive

T - 8 6 0

DANIEL C. BAKER ASSOCIATES, INC.

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SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552

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WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 - MOTOR VEHICLE CODE

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Drum Cliff Drive

T. R. No.: 860

From: Hillcrest Drive

To: Londonderry Drive

Posted Speed Limit: No

ADT: 500±

Total Length of Road (Ft.): 645

HIGHWAY RESTRICTIONS:

- Geometric Review** – The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** – An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** – A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness:

General Condition: Good

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: Yes

Other:

- Traffic Generators** – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
 - Coal Stripping Mining
 - Quarry Operation
 - Warehouse
 - Other
 - Shopping Mall
 - Timber Harvesting Operation
 - Trucking Terminal

BRIDGE RESTRICTIONS:

- General** – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
 - The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, #212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 10 ton weight limit on Drum Cliff Drive.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
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6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020 FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Drum Cliff Drive

T. R. No.: 860

From: Hillcrest Drive

To: Londonderry Drive

Posted Speed Limit: None

ADT: ±500

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (2")
Road Dept instruction that Londonderry Drive
and Drum Cliff Drive
same depth & material

Base Course/Depth: Bituminous wearing (1 ½")
Bituminous binder (3 ½")
Limestone 2A (2")
PA#4 (4")

Width of Surface: 22'

Shoulder Width/Type: N/A

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: 25' Radii @ intersection with Londonderry Drive

Under Clearance: Adequate

Minimum Site Distance:

Vertical: Adequate

Horizontal: Adequate

Slope Gradient:

Minimum: -7% @ sta 5+65

Maximum: +6% @ sta 4+20

Surface Chip Seal

Road Name: Drum Cliff Drive

Inspected Date: November 12, 2008

DISTRESS TYPE		LOW	MEDIUM	HIGH
1	Corrugation			
2	Distortion	X		
3	Surface Deterioration	X		
4	Rutting			
5	Potholes			
6	Bleeding	X		
7	Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Drum Cliff Drive T-860

Hillcrest Drive

DANIEL C. BAKER ASSOCIATES, INC.

CONSULTING ENGINEERS
SURVEYORS AND PLANNERS

6056 TUSCARAWAS ROAD BEAVER, PENNSYLVANIA 15009-9552

(724) 495-7020 FAX: (724) 495-2594

E-mail: dcbaker@usaor.net

WEIGHT, SIZE & LOAD RESTRICTIONS BASED ON CONDITION OF HIGHWAY CHAPTER 201, SECTION 201.81 OF TITLE 67 CHAPTER 189, ROAD BONDING REGULATIONS SECTION 4902 OF TITLE 75 – MOTOR VEHICLE CODE

Municipality : Daugherty Township

County: Beaver

Road/Street Name: Hillcrest Drive

T. R. No.: N/A

From: Marion Hill Road

To: End

Posted Speed Limit: 25 mph

ADT: 2000± (southern section)

Total Length of Road (Ft.): 1,469

HIGHWAY RESTRICTIONS:

- Geometric Review** – The highway has inadequate turning radii, horizontal width or under clearance at one or more locations.
- Past Experience** – An analysis of previous climatic conditions indicates that certain weight vehicles should have been prohibited from the highway.
- Pavement Analysis** – A pavement analysis and/or engineering judgment indicates existing physical deterioration due to heavy vehicle use requires that certain weight vehicles be prohibited.

Pavement Type: Chip Seal

Thickness: 1 Inch

General Condition: Fair

Adequacy of Drainage: Fair

Base Pushing: Yes

Cross Section Deterioration: Yes

Surface Alligatored: No

Shoulder Damage: Yes

Other:

- Traffic Generators** – One or more of the following traffic generators is in the planning and/or development stage and can only be reached by this road:
- | | |
|--|--|
| <input type="checkbox"/> Coal Stripping Mining | <input type="checkbox"/> Shopping Mall |
| <input type="checkbox"/> Quarry Operation | <input type="checkbox"/> Timber Harvesting Operation |
| <input type="checkbox"/> Warehouse | <input type="checkbox"/> Trucking Terminal |
| <input type="checkbox"/> Other | |

BRIDGE RESTRICTIONS:

- General** – The bridge has poor alignment, inferior bridge or guide rails, substandard horizontal or vertical clearance, substandard under clearance, or requires protection against accidents or damage.
- Structural Analyses.**
- The bridge is not designed for AASHTO 20 loading.
 - The bridge has been damaged by fire, accident or environmental deterioration.
 - Engineering calculations indicate overstressing of members when subject to maximum legal loads.
 - Engineering judgment indicates that the further use of heavy vehicles could damage the structure.

The above is a compilation of the results of an engineering and traffic study conducted in accordance with the provisions of Title 67 PA Code Ch. 212, #212.117. As a result of the study, it has been determined that to prevent further damage, I recommend Daugherty Township post a 10 ton weight limit on Hillcrest Drive.

Field Inspection Conducted on September 10, 2008 & November 12, 2008.

By: Timothy J. Schutzman, P.E.

Signature:

Recommended By: Craig A. Baker, P.E., P.L.S.

Signature:

Title: Township Engineer

Date: November 20, 2008

DANIEL C. BAKER ASSOCIATES, INC.

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6056 TUSCARAWAS ROAD

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WEIGHT, SIZE & LOAD RESTRICTIONS FIELD DATA WORK SHEET

Municipality: Daugherty Township

County: Beaver

Road/Street Name: Hillcrest Drive

T. R. No.: N/A

From: Marion Hill Road

To: End

Posted Speed Limit: 25 mph

ADT: ±2000

Posted Weight Limit: None

Surface Type/Depth: Tar & Chip (1")

Base Course/Depth: FB wearing (2")
FB binder (4 ½")
2A Limestone (6")

Width of Surface: 22'

Shoulder Width/Type: 3'/Dirt and Stone

Vertical Clearance: Adequate

Horizontal Clearance: Adequate

Past Experience: Excessive load weights and climatic conditions causing pavement fatiguing.

Turning Radii: Narrow turning radius at end of road

Under Clearance: Adequate

Minimum Site Distance:

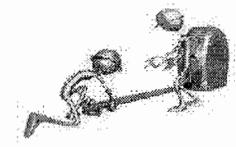
Vertical: 129' @ sta 13+17

Horizontal: Adequate

Slope Gradient:

Minimum: -8% @ sta 6+05

Maximum: +10% @ sta 4+20



Daugherty Township Sight Distance Measurements

Road Name: Hillcrest Drive

Vertical Sight Distance (VSD)

Horizontal Sight Distance (HSD)

Station : 13+17

Station : _____

VSD #1 : 129

HSD #1 : _____

Station : _____

Station : _____

VSD #2 : _____

HSD #2 : _____

Station : _____

Station : _____

VSD #3 : _____

HSD #3 : _____

Station : _____

Station : _____

VSD #4 : _____

HSD #4 : _____

AASHTO – Geometric Design of Highway and Streets 2004 (Fifth Edition)

Stopping Sight Distance				
Design Speed (mph)	Brake reaction distance (ft)	Braking Distance On level (ft)	Stopping sight distance Calculated (ft)	Design (ft)
15	55.1	21.6	76.7	80
20	73.5	38.4	111.9	115
25	91.9	60.0	151.9	155
30	110.3	86.4	196.7	200
35	128.6	117.6	246.2	250
40	147.0	153.6	300.6	305
45	165.4	194.4	359.8	360
50	183.8	240.0	423.8	425
55	202.1	290.3	492.4	495

"Sight distance is the distance along a roadway throughout which an object of specific height is continuously visible to the driver" as stated in the American Association Of State Highway And Transportation Officials (AASHTO). Sight distance is separated in different categories. Stopping Sight distance will be considered in this engineering study. To calculate stopping sight distance the height of the driver's eye is 3.5 feet and the height of the object on the road is 2.0 feet.

Surface Chip Seal

Road Name: Hillcrest Drive

Inspected Date: November 12, 2008

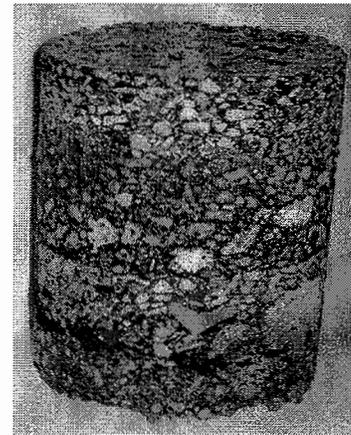
DISTRESS TYPE	LOW	MEDIUM	HIGH
1 Corrugation	X		
2 Distortion	X		
3 Surface Deterioration	X		
4 Rutting	X		
5 Potholes			
6 Bleeding	X		
7 Loose Chips	X		

LOW	MEDIUM	HIGH
Depth < 1"	Depth > 1" < 2"	Depth > 2"
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Noticeable loss of surface integrity	Moderate loss of surface integrity	Severe loss of surface integrity
Depth < 1/2"	Depth > 1/2" < 2 1/2"	Depth > 2"
Depth < 1" area < 3 Sq. Ft.	Depth > 1" < 2" area > 3 < 6 Sq. Ft.	Depth > 2" area > 6 Sq. Ft.
Thin film of bituminous	Thick film of bituminous	Extensive film of bituminous
Minimal amount < 10% of surface	Moderate amount > 10% < 30% of surface	Excessive amount > 30% of surface

Daugherty Township

Structural Analysis Calculations

Hillcrest Drive
Pavement Core #14



SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous Surface Chip Seal	1'	x	0	=	0
Bituminous Wearing (FB)	2"	x	0.42	=	0.84
Bituminous Binder (FB)	4 1/2"	x	0.42	=	1.89
Crushed Aggregate (PennDOT 2A)	6"	x	0.11	=	0.66
					<hr/> 3.39

Core Sample taken @ station 7+60

Minimum depths of pavement course based on Daugherty Township Subdivision and Land Development Ordinance No. 89 (Section 6.0 Improvements)

SURFACE COURSE	DEPTH (INCH)		STRUCTURAL NUMBER PER INCH OF DEPTH	=	STRUCTURAL NUMBER
Bituminous					
Wearing Course	1"	x	0.44	=	0.44
Binder Course	2 1/2"	x	0.44	=	1.1
Concrete Base Course	5"	x	0.34	=	1.7
Crushed Aggregate Base	8"	x	0.14	=	1.12
Subbase Crushed Aggregate	3"	x	0.11	=	0.33
					<hr/> 4.69
			Minimum Required Structural No.	=	4.69

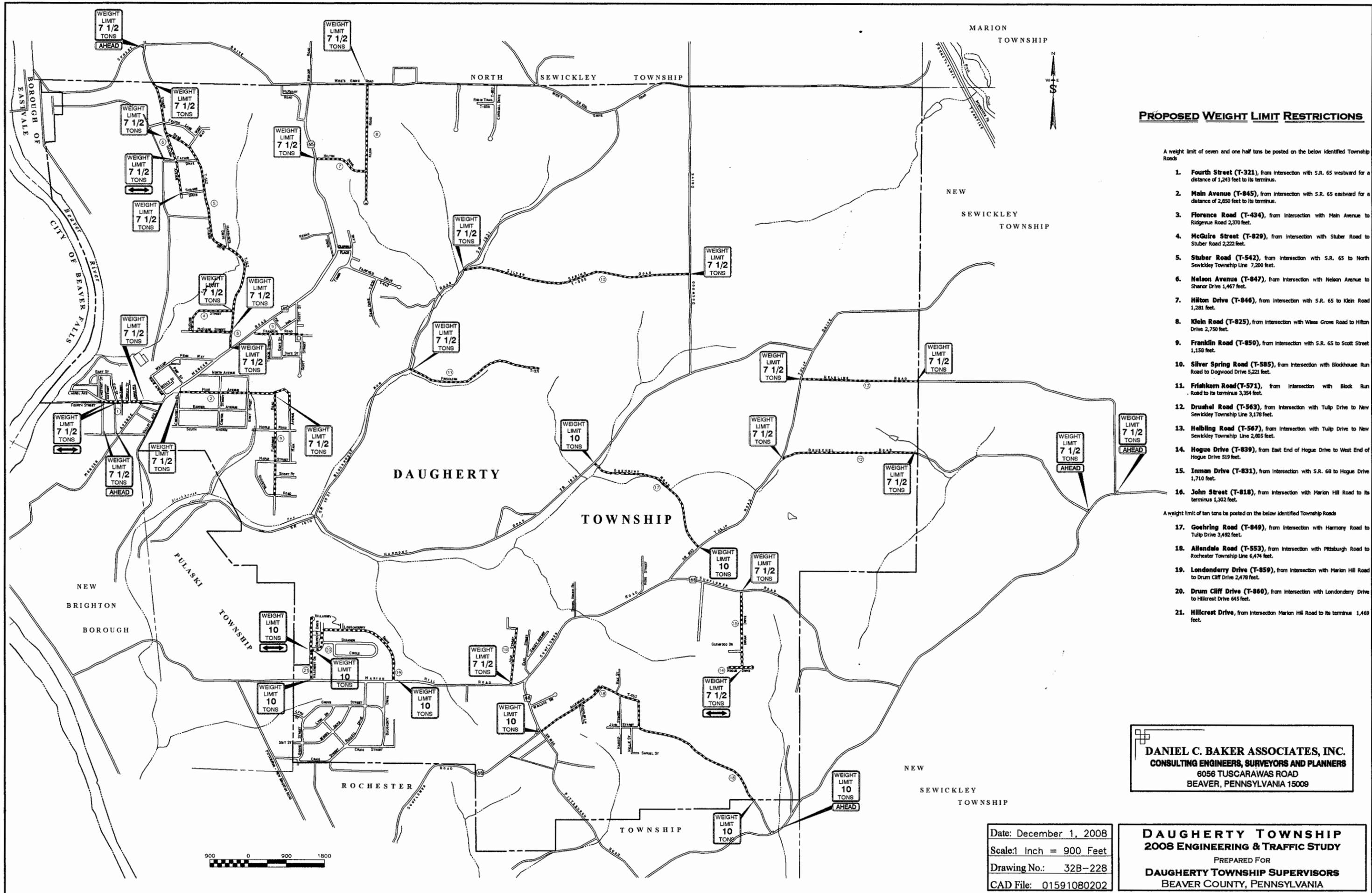
Daugherty Township

Engineering and Traffic Study

Photographs taken 11/14/08



Hillcrest Drive



PROPOSED WEIGHT LIMIT RESTRICTIONS

A weight limit of seven and one half tons is posted on the below identified Township Roads

1. **Fourth Street (T-321)**, from intersection with S.R. 65 westward for a distance of 1,243 feet to its terminus.
2. **Main Avenue (T-845)**, from intersection with S.R. 65 eastward for a distance of 2,650 feet to its terminus.
3. **Florence Road (T-434)**, from intersection with Main Avenue to Ridgeway Road 2,370 feet.
4. **McGuire Street (T-829)**, from intersection with Stuber Road to Stuber Road 2,222 feet.
5. **Stuber Road (T-542)**, from intersection with S.R. 65 to North Sewickley Township Line 7,200 feet.
6. **Nelson Avenue (T-847)**, from intersection with Nelson Avenue to Shanor Drive 1,467 feet.
7. **Hilton Drive (T-846)**, from intersection with S.R. 65 to Klein Road 1,281 feet.
8. **Klein Road (T-825)**, from intersection with Weiss Grove Road to Hilton Drive 2,750 feet.
9. **Franklin Road (T-850)**, from intersection with S.R. 65 to Scott Street 1,158 feet.
10. **Silver Spring Road (T-585)**, from intersection with Brookhouse Run Road to Dogwood Drive 5,221 feet.
11. **Frishkorn Road (T-571)**, from intersection with Block Run Road to its terminus 3,354 feet.
12. **Drushtel Road (T-563)**, from intersection with Tulip Drive to New Sewickley Township Line 3,178 feet.
13. **Helbling Road (T-567)**, from intersection with Tulip Drive to New Sewickley Township Line 2,805 feet.
14. **Hogue Drive (T-839)**, from East End of Hogue Drive to West End of Hogue Drive 519 feet.
15. **Inman Drive (T-831)**, from intersection with S.R. 68 to Hogue Drive 1,710 feet.
16. **John Street (T-818)**, from intersection with Marion Hill Road to its terminus 1,302 feet.

A weight limit of ten tons is posted on the below identified Township Roads

17. **Goehring Road (T-849)**, from intersection with Harmony Road to Tulip Drive 3,492 feet.
18. **Allendale Road (T-553)**, from intersection with Pittsburgh Road to Rochester Township Line 6,474 feet.
19. **Londonderry Drive (T-859)**, from intersection with Marion Hill Road to Drum Cliff Drive 2,478 feet.
20. **Drum Cliff Drive (T-860)**, from intersection with Londonderry Drive to Hillcrest Drive 645 feet.
21. **Hillcrest Drive**, from intersection Marion Hill Road to its terminus 1,469 feet.

DANIEL C. BAKER ASSOCIATES, INC.
 CONSULTING ENGINEERS, SURVEYORS AND PLANNERS
 6056 TUSCARAWAS ROAD
 BEAVER, PENNSYLVANIA 15009

Date: December 1, 2008
 Scale: 1 Inch = 900 Feet
 Drawing No.: 32B-228
 CAD File: 01591080202

DAUGHERTY TOWNSHIP
2008 ENGINEERING & TRAFFIC STUDY
 PREPARED FOR
DAUGHERTY TOWNSHIP SUPERVISORS
 BEAVER COUNTY, PENNSYLVANIA

Conclusion and Recommendation:

Overweight Vehicles have exceeded the strength of the existing Daugherty Township roads. These roads that have withstood the pounding of ordinary loads no longer appear to be adequate to meet the present day conditions. Wide spread failure is demonstrative of the fact the roads cannot carry unlimited loading. Weight restrictions are necessary in order to protect the infrastructure from premature deterioration due to repeated loading of overweight trucks and climatic conditions.

Geometric review has found that some Township Roads have inadequate turning movements for large size vehicles. The dimension and minimum turning path of a vehicle affects the turning movement and width of traveled way in the intersection areas. Conflict occur between vehicles when traffic is either diverging, weaving or crossing into opposing traffic lanes due to inadequate turning movements.

Pavement analysis indicated that all roads inspected under this Traffic Study do not meet the current minimum depths of pavement course established in the Daugherty Township Subdivision and Land Development Ordinance No. 89. This Engineering and Traffic Study found all roads inspected were treated with an emulsion based chip seal. Emulsion based chip seal are used as pavement preservation treatment on pavement. Their primary purpose is to seal fine cracks in the underlying pavements surface and prevent water intrusion into the base and subgrade. Chip seal are not expected to provide additional structural capacity to the pavement. The pavement analysis also found some roads were constructed with FB mixes, which are considered to be highly flexible because the mix has a high void content. Because of its flexibility FB bituminous material is recommended for use on low volume roads that have highly flexible existing pavement structures.

It is my opinion that a weight limit of seven and one half tons be posted on the below identified Township Roads. This is necessary to prevent further damage, deterioration and reduce the possible hazardous conditions. I recommend a weight limit of seven and one half tons be imposed upon those Township Roads, between those intersections listed and for the distance set forth:

1. Fourth Street (T-321), from intersection with S.R. 65 westward for a distance of 1,243 feet to its terminus.
2. Main Avenue (T-845), from intersection with S.R. 65 eastward for a distance of 2,850 feet to its terminus.
3. Florence Road (T-434), from intersection with Main Avenue to Ridgevue Road 2,370 feet.
4. McGuire Street (T-829), from intersection with Stuber Road to Stuber Road 2,222 feet.
5. Stuber Road (T-542), from intersection with S.R. 65 to North Sewickley Township Line 7,200 feet.
6. Nelson Avenue (T-847), from intersection with Stuber Road to Shanor Drive 1,467 feet.
7. Hilton Drive (T-846), from intersection with S.R. 65 to Klein Road 1,281 feet.
8. Klein Road (T-825), from intersection with Wises Grove Road to Hilton Drive 2,750 feet.
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4. Drum Cliff Drive (T-860), from intersection with Londonderry Drive to Hillcrest Drive 645 feet.
5. Hillcrest Drive, from intersection Marion Hill Road to its terminus 1,469 feet.

Appropriate restriction signs shall be erected as shown on the attached plan.