Kiley Associates, LLC
Surveyors & Engineers
536 Purdytown Turnpike, Lakeville, PA 18438
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MEMORANDUM

To: David Pannasch
From: Joseph D. Hudak, P.E.
Project: Tink Wig Road Study
Date: June 7, 2024

A. Visual Inspection: An inspection was performed on April 12, 2024:

1. Speed bump on Tink Wig Drive at SR 590: See Figure 1. The traffic calming element installed is a speed bump, not a speed hump as implied by the sign. Speed humps tend to be slightly smaller in height and longer than speed bumps; speed bumps are taller and more likely to be found in a parking lot. Both serve the purpose of slowing vehicles. Speed bumps will reduce the speed of vehicles to around 5-10 MPH; speed humps can be driven over at a speed of 15 to 20 MPH. The sign should read “Speed Bump” and be placed in-line with the speed bump; the boulders should be removed. A typical detail for a speed hump is attached; refer to the Speed Hump Notes for recommended locations and spacing, as well as markings.

Figure 1 – Speed bump on Tink Wig Drive

2. Tink Wig Drive culverts: Replacement of any culvert carrying a stream will require either a General Permit-7 (GP-7) or General Permit-11 (GP-11). The drainage area tributary to the culvert will determine which GP is applicable. For example, a drainage area of less than one (1) square mile will be handled by a GP-7, which is reviewed by the Pike County Conservation District (PCCD). A drainage area of one (1) square mile or greater will be handled by a GP-11, which is reviewed by the Pennsylvania Department of Environmental Protection (PaDEP). Either GP will require engineering calculations (e.g. hydraulic & hydrologic analysis of pipe capacity, etc.) and drawings (e.g. culvert installation details, E&S controls, etc.).

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3. Parkwood Drive: Refer to Figure 2a. Roadway “sinking” at a culvert location is the result of:

    - Pipe failure.
    - Improper installation of the backfill material surrounding the culvert.
    - Insufficient cover over the crown of the pipe.

Figure 2a – Roadway deflection at culvert on Parkwood Drive

Inspection of the interior of the culvert revealed a slight deformation of the culvert but no “failure” (e.g. a pipe broken through-and-through at its crown); refer to Figure 2b. Thus, it is reasonable to conclude that the backfill surrounding the pipe was placed improperly and/or there was insufficient fill over the pipe.

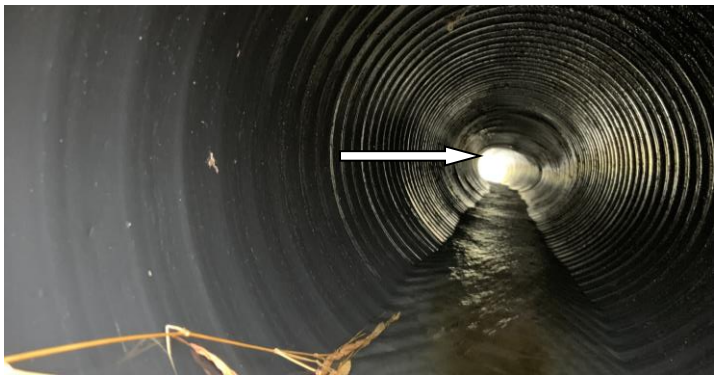

Figure 2b – Slight deflection of culvert on Parkwood Drive

4. Tink Wig Drive and Parkwood Drive: Refer to Figure 3a. The condition of runoff along the edge of the pavement, with associated shoulder erosion is the result of the ground along the edge of the pavement being higher than the adjacent pavement edge. As a result, water runs along that pavement/ground boundary, instead of off the road surface, across

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the grass shoulder, and into the drainage swale. The remedy for this condition is to "scalp" the shoulders so the ground adjacent to the pavement edge slopes away from the pavement and toward the drainage swale. Refer to Figure 3b.

Figure 3a – Tink Wig Drive and Parkwood Drive:

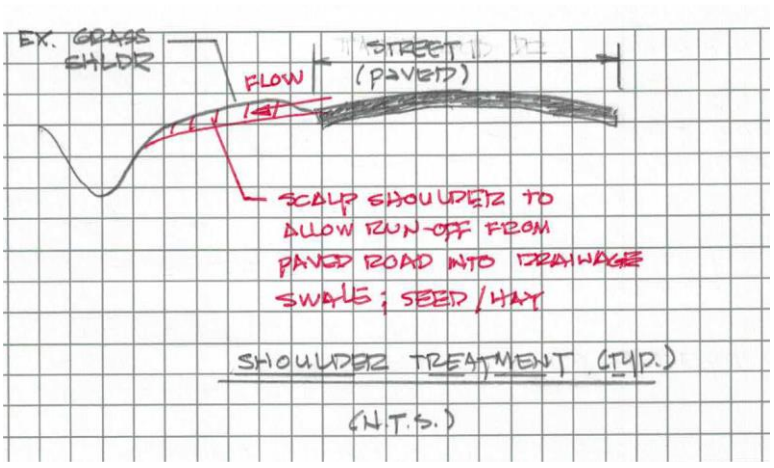

Figure 3b – Shoulder scalp

5. Cloud Crest Drive and Catamount: The current intersection geometry consists of a wide gravel throat for Catamount intersecting the superelevated asphalt roadway of Cloud Crest Drive. Refer to Figure 4a.

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Figure 4a – Current Cloud Crest Drive/Catamount intersection

Refer to Figure 4b. Recommend extending the north edge of Catamount to the edge of Cloud Crest (red line) and replacing the gravel and asphalt with soils and grass (green lines). Grading should promote flow to the existing drainage ditch. Replacing the asphalt with grass will reduce the runoff. The narrowed intersection geometry will provide for slow speed turn into Catamount from southbound Cloud Crest.

Figure 4b – Recommended geometry for Cloud Crest Drive/Catamount intersection

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6. Catamount: Refer to Figure 5. Based on the curve geometry, the roadway appears to have an improper cross-slope (i.e. the outside of the curve (red arrow) is lower than the inside of the curve (white arrow)).

Figure 5 – Catamount improper cross slope

Depending on road surface conditions (e.g. wet, snow covered) and/or approach speed, a vehicle may leave the paved portion of the roadway along the outside of the curve. Recommend further engineering study to verify the roadway geometry and for a traffic barrier (e.g. guiderail) design.

7. Creek Road at Tow Path Road: Issues discussed included:

   - Maintenance responsibilities (i.e. POA v. PennDOT)
   - Sight distance
   - Highway Occupancy Permitting

   Recommend sight-distance study at the intersection.

B. Engineering Assessment:

1. Preventative Maintenance:

   - Roads - Bituminous roads should be maintained with a smooth and stable driving surface. Crack sealing and sealcoating (i.e. tar & chip) will add service life to a road surface. Roads with severe alligator cracking or deterioration (see Figure 6) are not candidates for either crack-sealing or sealcoating; these roads should be replaced.

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Figure 6 – Example of a deteriorated road surface that requires complete replacement

Main or heavily traveled roads should be checked annually. Lesser traveled roads can be checked every three (3) years.

- Shoulders – “Shoulder" refers to the graded area or surface adjacent and parallel to the traveled way, whose purpose is to give lateral support to the road surface and to be used by traffic in emergency situations. Shoulders should be stable enough to support normal traffic loading, and their surfaces should be adequately sloped to provide for the removal of surface water from the roadway into the drainage system.

  Shoulder drop-offs can present a hazard to motorists. Drop-offs greater than two inches should be addressed as soon as possible.

  Shoulder maintenance can be performed throughout the year.

- Drainage – Drainage facilities (e.g. swales, cross pipes, driveway pipes) should be maintained in operating condition, with cleaning in early Spring and again in the Fall.

- Roadside Management – Roadside management includes mowing, vegetation control (trimming and removal activities), and roadside litter control

  Mowing is necessary to maintain unobstructed views at intersections, driveways, and signs. Mowing must be routinely performed to prevent growth and development of weeds and trees.

  Conduct litter pickup three (3) times per year:

  1) Early Spring (scheduled prior to mowing or earth moving operations)

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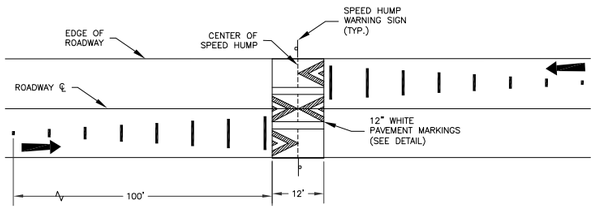
2) Mid-Summer
3) Fall

2. Dumping tar & chip debris in the POA red shale pit – Dumping of this material should be discouraged. A sediment barrier (e.g. compost filter sock, hay bales combined with filter fence) should be provided along the downstream end of the debris pile.

3. Tree Trimming – If a tree canopy is resulting in and/or exacerbating a slick or icy road condition, a site study should be performed to determine if canopy removal will remedy the slick or icy road condition. If removal is warranted, cutting ground-to-sky should be performed. Hazardous trees and trees near utility lines should be removed by skilled and adequately insured tree expert contractors.

   Brush resulting from trimming and/or removal activities may be chipped and uniformly blown onto the adjacent slope area, or into an enclosed chip box and disposed of at the most convenient and acceptable location near the job site. The stockpiling and use of these chips for Community landscape mulching purposes is encouraged.



ADVANCE WARNING MARKINGS FOR SPEED CUSHIONS (OPTIONAL)

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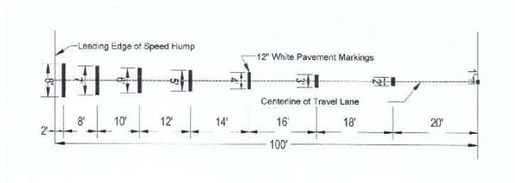

SPEED HUMP ADVANCE WARNING MARKINGS DETAIL

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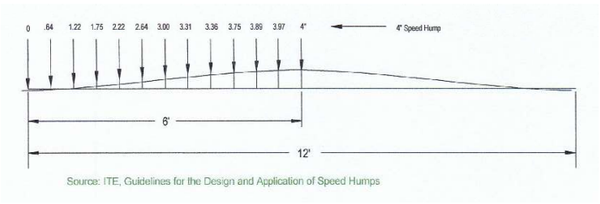
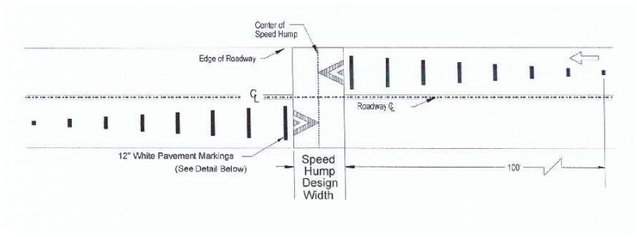


WATTS (TRRL PROFILE) SPEED HUMP DETAIL



ADVANCE WARNING MARKINGS FOR SPEED HUMPS

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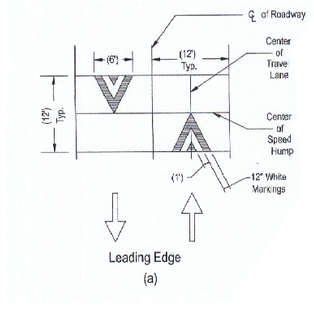

PAVEMENT MARKINGS FOR SPEED HUMPS

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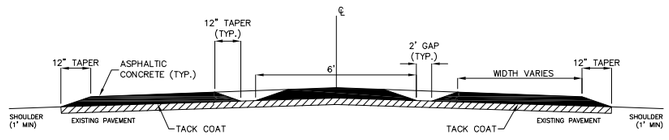

SPEED CUSHION CROSS-SECTION

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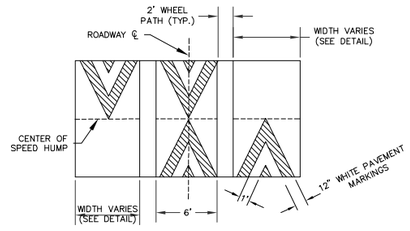
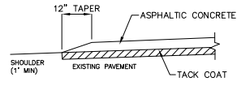


PAVEMENT MARKINGS FOR SPEED CUSHIONS (OPTIONAL)

N.T.S.

SPEED HUMP NOTES:

1. SPEED HUMPS SHOULD BE DISTINGUISHED FROM SPEED BUMPS, WHICH MAY BE ENCOUNTERED IN PARKING LOTS. SPEED BUMPS ARE USUALLY 3 TO 6 INCHES IN HEIGHT, 1 TO 3 FEET IN LENGTH, AND FORCE TRAFFIC TO SLOW TO 5 TO 10 MILES PER HOUR. SPEED BUMPS MAY GENERATE VERTICAL DISPLACEMENT AT LOW SPEED AND ARE NOT TO BE USED AS TRAFFIC CALMING MEASURES.
2. HUMPS SHOULD BE PLACED 250 TO 600 FEET APART. ONE STUDY SHOWED THAT PLACING WATTS SPEED HUMPS AT INTERVALS OF 275 FEET RESULTED IN 85TH PERCENTILE SPPEDS OF 25 MPH; INTERVALS OF 550 FEET RESULTED IN 85TH PERCENTILE SPEEDS OF 30 MPH.
3. NORMALLY, NO HUMP SHOULD BE PLACED WITHIN 150 FEET OF AN UNSIGNALIZED INTERSECTION OR 250 FEET OF A SIGNALIZED INTERSECTION.
4. SPEED HUMPS SHOULD NOT BE USED ON CURVES UNLESS THE RADIUS IS GREATER THAN 300 FEET.
5. HUMPS SHOULD NOT BE INSTALLED ON STREETS WITH A GRADE EXCEEDING 8%.
6. HUMPS SHOULD NOT BE INSTALLED ON STREETS WITHOUT CURBING UNLESS OBSTRUCTIONS SUCH AS SIGNING, FLEXIBLE DELINEATOR POSTS, OR BOLLARDS PREVENT DRIVERS FROM DRIVING AROUND THE HUMP. ROCKS, BOULDERS, AND OTHER OBJECTS OF THIS NATURE SHOULD NOT BE USED FOR THIS APPLICATION.
7. IDEALLY, SPEED HUMPS SHOULD EXTEND ACROSS THE ROADWAY FROM CURB TO CURB. THIS DESIGN IS GENERALLY PREFERRED BY BICYCLISTS, AND IT PREVENTS MOTORISTS FROM DRIVING WITH ONE WHEEL IN THE GUTTER (THIS MAY HAPPEN WITH TAPERED EDGES). IF DRAINAGE CANNOT BE ACCOMODATED UNDER CURB-TO-CURB CONDITIONS, IT IS RECOMMENDED THAT HUMPS END BEFORE BIKE LANES OR CONTINUE ACROSS THE BKIE LANE WITHOUT TAPERING OFF.
8. HUMPS USUALLY HAVE A PARABOLIC CROSS SECTION. A SINUSOIDAL CROSS SECTION IS HARDER TO CONSTRUCT BUT MAY BETTER FACILITATE SNOW REMOVAL.
9. ALTHOUGH SPEED HUMPS MAY CREATE NOISE FROM VEHICLES PASSING OVER THEM, THE OVERALL NOISE LEVELS ON THE STREET MAY BE REDUCED DUE TO LOWER VEHICLE SPEEDS.
10. TRAFFIC MAY DIVERT TO OTHER PARALLEL STREETS THAT ARE NOT TRAFFIC CALMED. IN AREAS WITH SNOW REMOVAL PROBLEMS, A MEASURE SUCH AS A FLEXIBLE DELINEATOR POST MAY BE NEEDED AT EACH HUMP TO ALERT SNOWPLOW OPERATORS TO LIFT THEIR BLADES.



SPEED HUMP SHOULDER DETAIL

N.T.S.

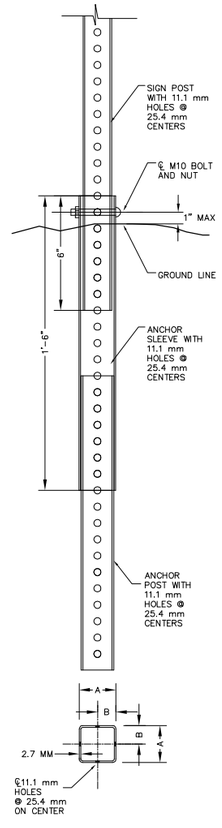
LOCATIONS OF ALL UNDERGROUND UTILITIES SHALL BE FIELD LOCATED BY THE CONTRACTOR PRIOR TO ANY EXCAVATION AND CONSTRUCTION WORK. CONTRACTOR SHALL CONTACT PENNSYLVANIA ONE CALL SYSTEM AT 1-800-242-1776 A MINIMUM OF THREE WORKING DAYS PRIOR TO BEGINNING ANY EXCAVATION ON THIS SITE.

SPEED CUSHION NOTES:

1. SPEED CUSHIONS MAY BE INSTALLED IN LIEU OF SPEED HUMPS AT LOCATIONS SHOWN ON THE PLAN.
2. SPEED CUSHIONS DO NOT IMPEDE OR SLOW EMERGENCY VEHICLES AS SIGNIFICANTLY AS SPEED HUMPS, BUT MAINTAIN THE ABILITY TO SLOW TRAFFIC.

SPEED HUMP WARNING SIGN

N.T.S.



SIGN POST (mm)				ANCHOR POST (mm)				ANCHOR SLEEVE (mm)				SPLICE SLEEVE (mm)			
SIZE	DIMENSION A	DIMENSION B	THICK.	SIZE	DIMENSION A	DIMENSION B	THICK.	SIZE	DIMENSION A	DIMENSION B	THICK.	SIZE	DIMENSION A	DIMENSION B	THICK.
44.4	44.5	22.2	2.7	50.8	50.8	25.4	2.7	57.2	57.2	28.6	2.7	38.1	A	B	2.7

INSTALLATION INSTRUCTION:

1. DRIVE ANCHOR POST AND ANCHOR SLEEVE INTO THE GROUND SIMULTANEOUSLY. USE THE APPROPRIATE SIZE DRIVE CAP UNTIL ONLY ONE HOLE REMAINS ABOVE THE GROUND.

2. SLIDE A MINIMUM OF 150MM OR 6-INCHES OF THE SIGN POST INTO THE ANCHOR POST.

3. ATTACH THE SIGN POST TO THE ANCHOR POST AND SLEEVE WITH ONE M10 BOLT AND NUT THROUGH THE TOP HOLE OF THE ANCHOR POST AND SLEEVE.

4. BY THE "TURN OF THE NUT" METHOD, BRING THE NUT TO A SNUG CONDITION TO ENSURE THAT ALL PARTS ARE BROUGHT TOGETHER INTO FULL CONTACT WITH EACH OTHER, THEN TIGHTEN AN ADDITIONAL ¼ TURN.

SIGN BREAK-AWAY INSTALLATION DETAIL

N.T.S.

REVISION SUMMARY:

NOT TO SCALE

SCALE: NOT TO SCALE
DATE:
DWG.#
TAX#:
DB/PG:
CLIENT:
DRAWN BY:
SHEET #:

DETAIL SHEET

TRAFFIC CALMING PLANS

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