
VDOT
Virginia Department of Transportation

PAVEMENT SHOULDER WEDGE

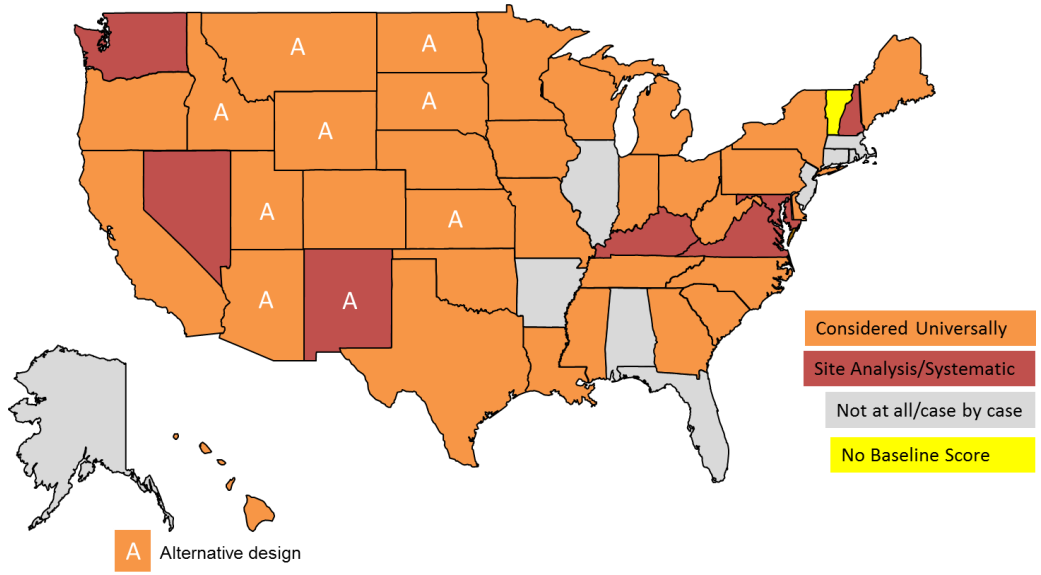
2020 Asphalt Seminar

Mark A. Cole, PE

March 10, 2020

What is Pavement Shoulder Wedge?

- 30 degree pavement edge
- FHWA – Every Day Counts 1 initiative (2010)
- FHWA Proven Safety Countermeasure
- VDOT IIM-MD-002 (recently updated)
- Being deployed in 40+ states to date
- 150+ miles installed in Virginia to date



Source: Federal Highway Administration

Why Should We Use Pavement Shoulder Wedge?

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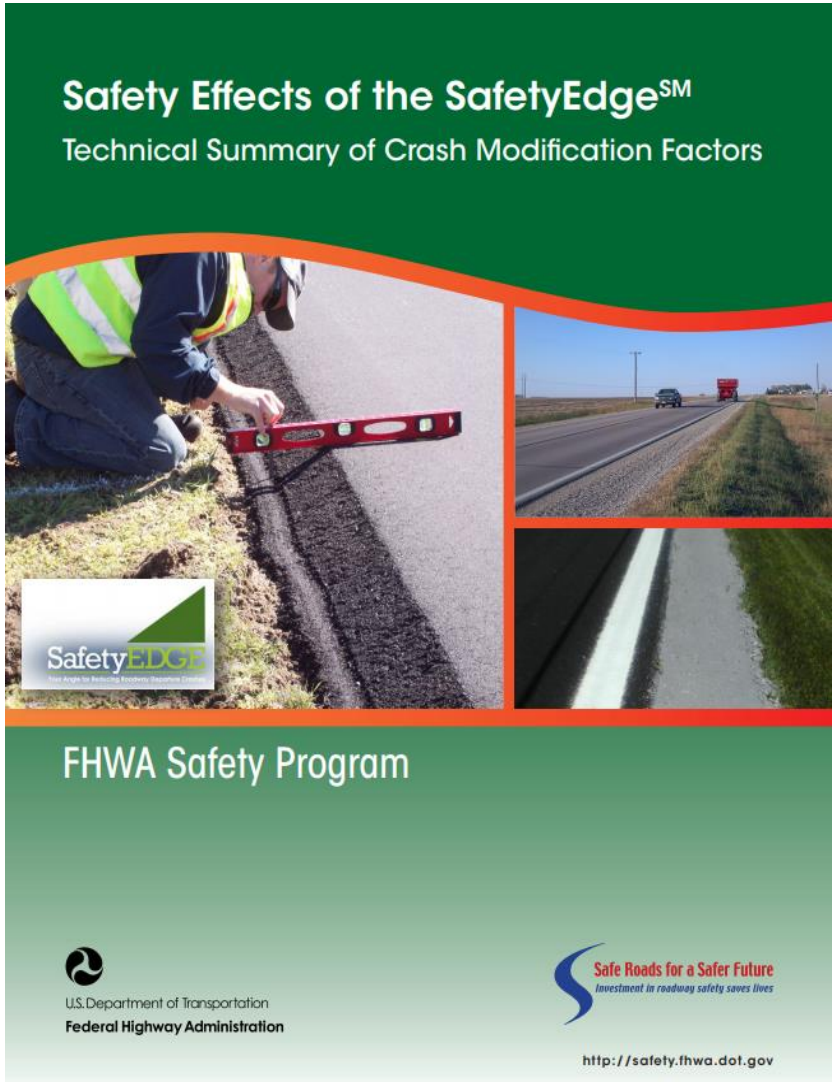
Why Should We Use Pavement Shoulder Wedge?

- 20% reduction in run off road and opposite direction crashes
- More stable/compact pavement edge

What this could mean for Virginia:

- 124 deaths and 3373 injuries every year from run off road and opposite direction crashes on non-curb and gutter / non-interstate roads
- If safety edge is deployed, we could save 13 lives and 281 injuries per year
- Benefit/Cost ratio of 17



When and where to use

All paving projects (New construction, Maintenance, and Permit work), that mill or pave to the edge of pavement, and meet the following conditions:

1. **Open ditch sections (no curb and gutter)**
2. **Paved Shoulder ≤ 4 ft**
3. **Speed limits > 35 mph**
4. **Final asphalt surface lift ≥ 1.25 inch**

Waivers and/or exceptions may be granted by the District Traffic Engineer, and shall be documented in the project file

Example : Speed Limit = 55 MPH
Overlay = 1.25” thick

When and where to use (Cont.)

Stop pavement wedge:

1. **At Driveways, intersections, interchanges, or bridges.**
2. **Unpaved shoulder <1 ft (if placing wedge over unpaved shoulder)**
3. **Guardrail within 3 ft from EOP (to face of rail)**

Waivers and/or exceptions may be granted by the District Traffic Engineer, and shall be documented in the project file

Cross Section: Wedge over unpaved shoulder

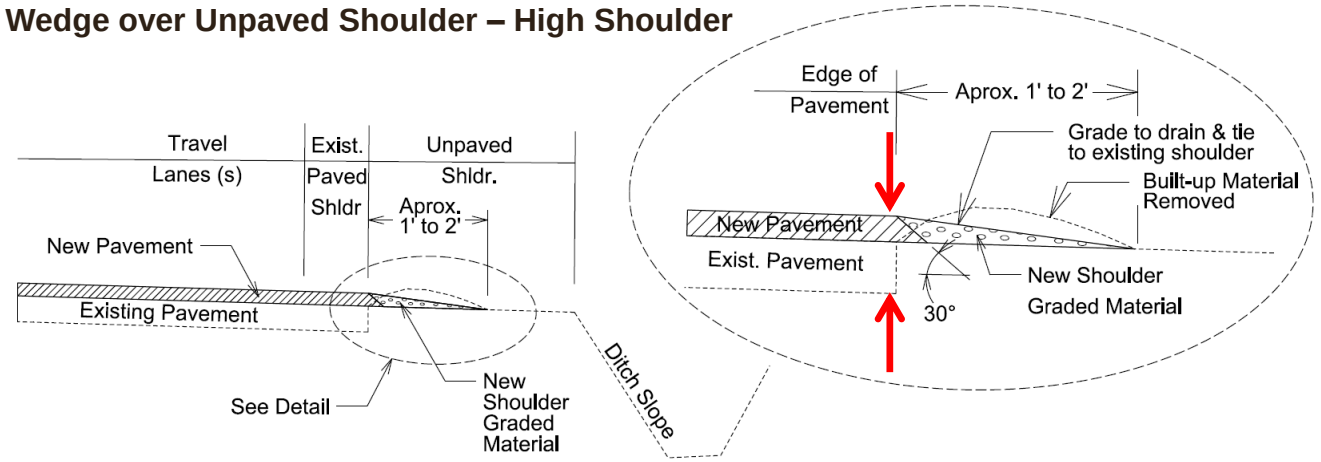
Preferred method; especially if you have narrow lanes/shoulders/bike lanes and/or rutted shoulders

- No need to narrow lanes
- Preserves bike space
- Maximizes protection in pavement edge drop off/rutted shoulder areas

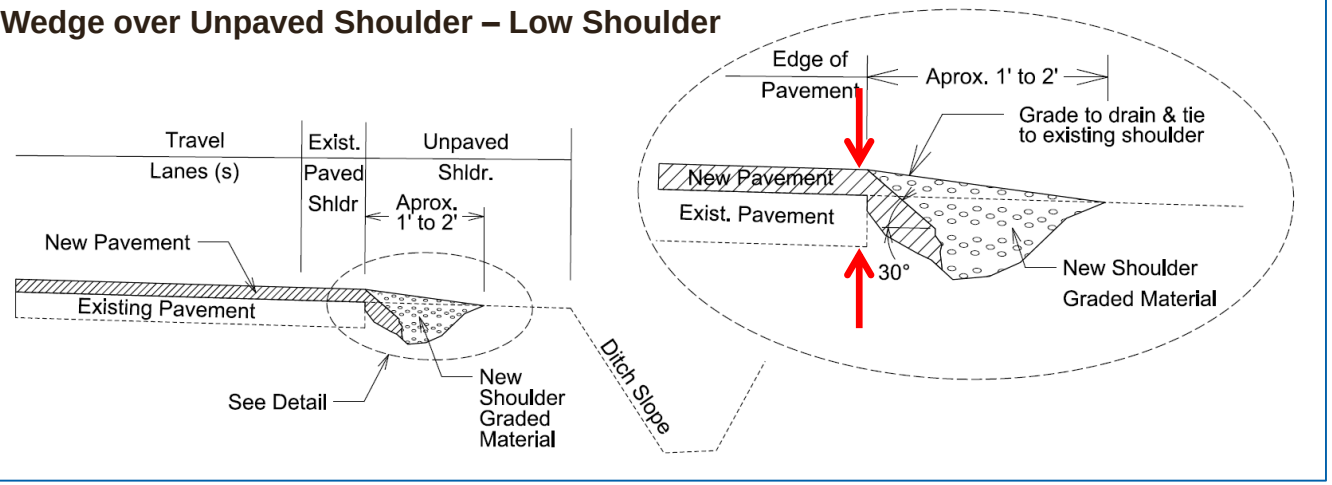
The KEY to avoid wedge breakoffs is to keep the beginning of the wedge over the existing pavement.

(See RED arrows)

Wedge over Unpaved Shoulder – High Shoulder



Wedge over Unpaved Shoulder – Low Shoulder

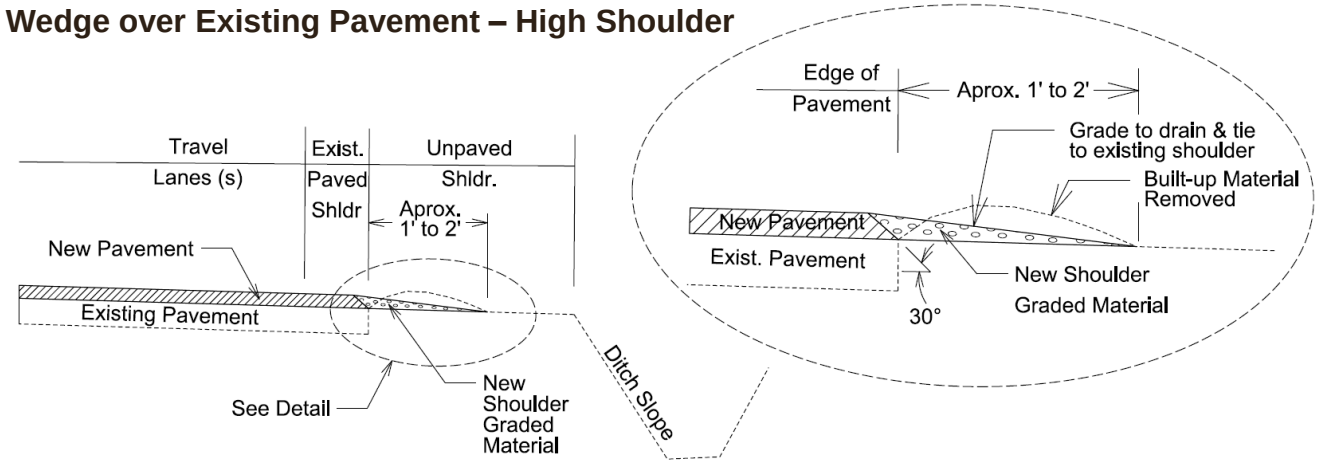


Cross Section: Wedge over paved shoulder

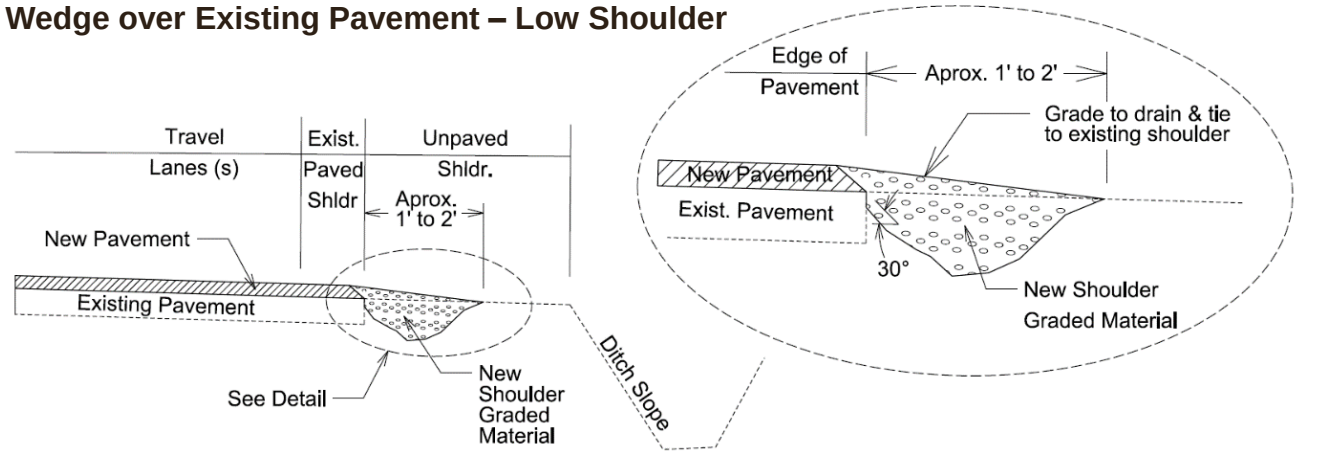
Allowable method; Easier to construct…. However several factors should be consider:

- Reduces lane/shoulder widths by 2-4 inches for typical situations
- Impacts bike space
- less protection in areas with pavement edge drop offs

Wedge over Existing Pavement – High Shoulder



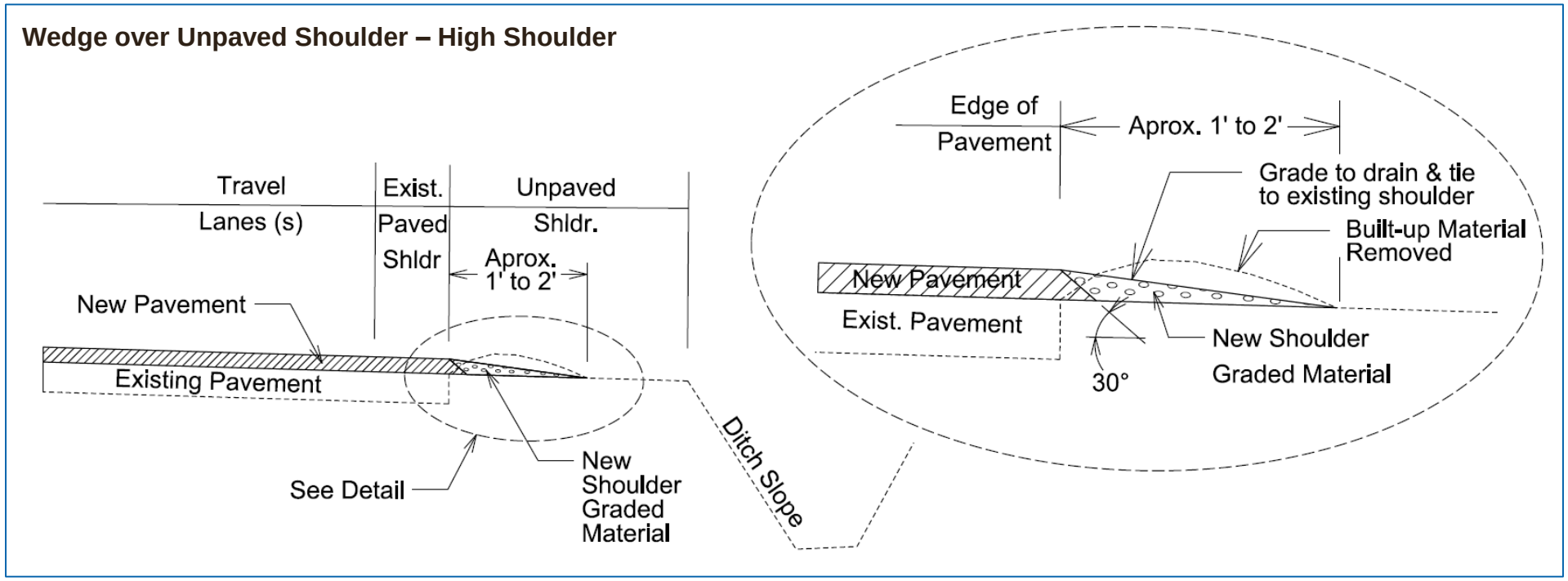
Wedge over Existing Pavement – Low Shoulder



Is Pavement Shoulder Wedge Preparation required?

Required Only with High Shoulder (Build-up):

1. Remove the soil build-up and vegetation within one foot from the edge of pavement
2. Place pavement and shoulder wedge
3. Place shoulder aggregate flush with the final asphalt overlay

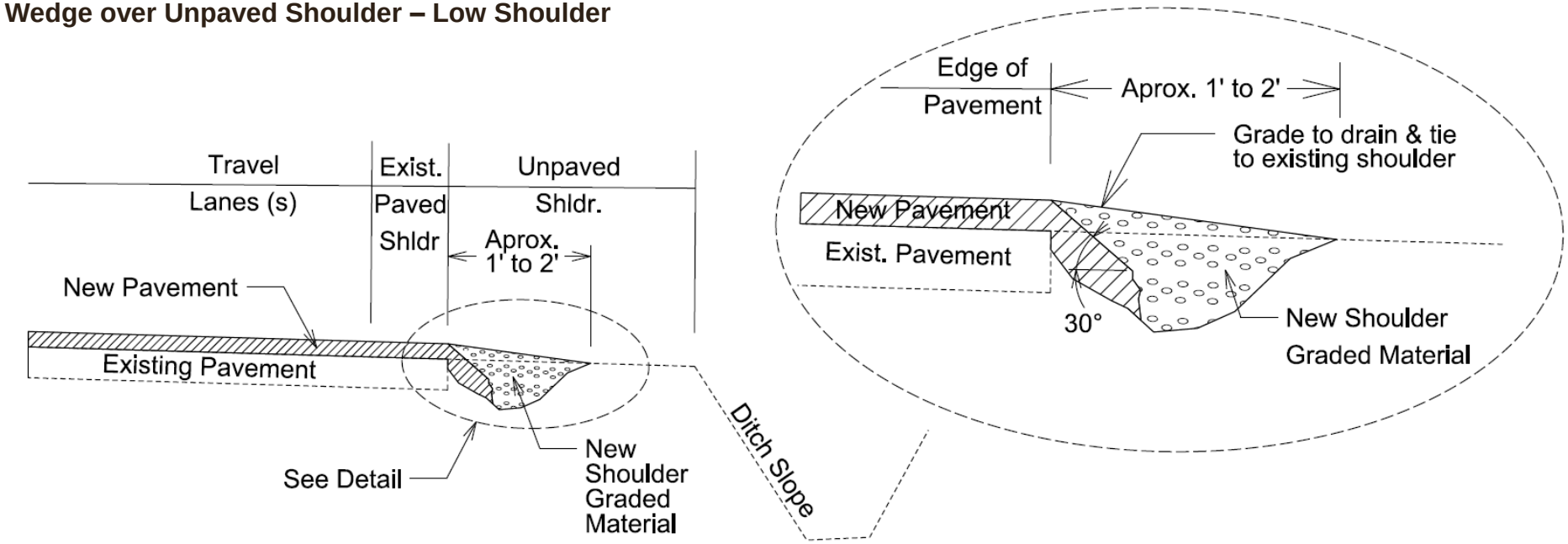


Is Pavement Shoulder Wedge Preparation required?

Not required in locations with Low Shoulder (drop offs):

1. Place pavement and shoulder wedge
2. Place shoulder aggregate flush with the final asphalt overlay

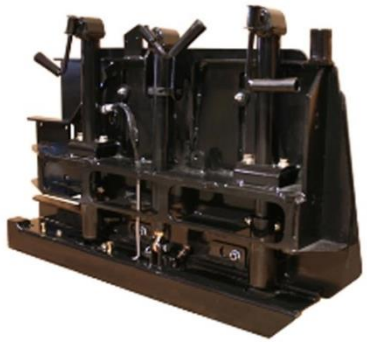
Wedge over Unpaved Shoulder – Low Shoulder

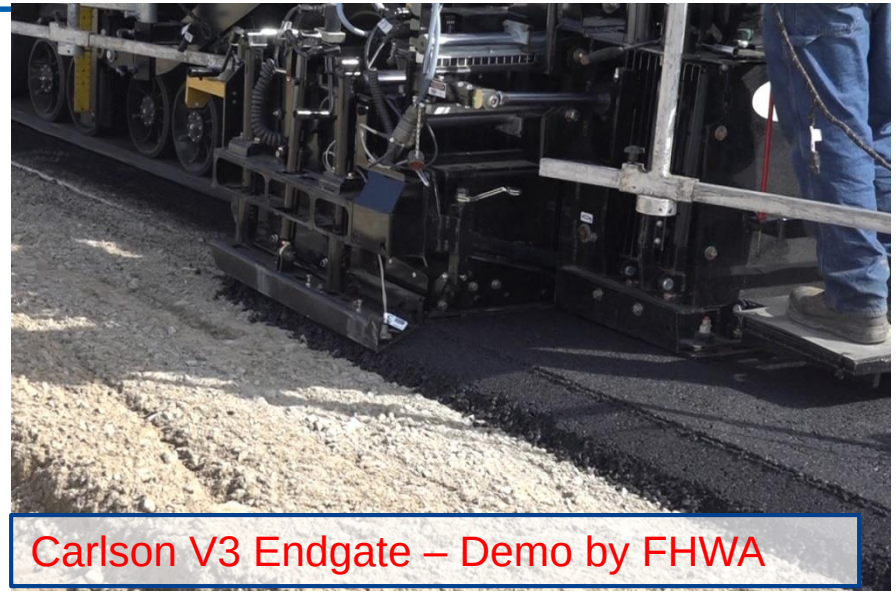


Equipment

Attach a wedge forming and consolidating device to the paver screed. The device shall

- **Accommodate varying thicknesses from 1.25” – 5”**
- **Confines asphalt at the end gate;**
- **Extrudes asphalt to form a sloped, compacted wedge shape of 30° ± 5°**
- **Transitions at x-roads, driveways, and obstructions**
- **Hand work may be required**





Carlson V3 Endgate – Demo by FHWA

Ramp Champ (Advant) –Staunton Dist Demo

Are there any E&S or Stormwater requirements?

- **The project is subject to E&S requirements if the surrounding soil is cleared, graded or excavated, and exceeds the 2,500 or 10,000 square foot threshold for E&S (may be exceeded in high shoulder areas)**
- **If the land-disturbance threshold is exceeded, follow the overall project SWPPP and ESC Plans/regulations in the Contract.**
- **The SWPPP should emphasize the Good Housekeeping requirements in the Contract Documents.**

While the project can be a land-disturbing activity, the project meets the definition in the Virginia Stormwater Management Act's exemption for routine maintenance as defined under § 62.1-44.15:34.C.7. Hence; there are no stormwater requirements or a need for a VSMP permit.

Questions/ additional information?
Chris Swanson (804) 786-6839
chris.swanson@vdot.virginia.gov

What are the bid items for Pavement Wedge?

- **Pavement shoulder wedge:**

  Payment included in the cost for furnishing, delivering, shaping and compacting the Asphalt concrete (shaping the wedge is Not paid for separately)

  Ex: 16360 ASPH. CONC. TY. SM 12.5E - Ton

- **Pavement shoulder wedge Prep – Linear FT**

  Includes grading the unpaved shoulder to accommodate the wedge, also includes removing / disposing of any built-up or surplus materials

  16368 - PAVEMENT SHOULDER WEDGE PREP - Linear FT

- **Aggregate base material - Sec 305**

  Includes furnishing, delivering, shaping and compacting the aggregate base to repair and fill any low shoulders.

  Ex: 16242 AGR.BASE MAT.TY.I OR II NO. 21A OR21B - Ton

A note in the contract for each location should indicate if the pavement shoulder wedge is required on "Left Side only", "Right side only", or "Both sides" of the roadway

Commonwealth of Virginia -- Department of Transportation
Maintenance Division

District: Richmond **Date:** 12/18/2019

Page 1 of 20 **Schedule:** PM-4D-20 Dinwiddie Co.

State Project Number: PM4D-026-F20, P401

Route:	1 (R-VA US00001SB)	**Milepost From:**	0	Brunswick/Dinwiddie CL	
Subdivision:		**Lane:**	S	**PCN:** M420PMD115056	**UPC:** 115056
Traf Grp:	X	**Milepost To:**	0.74	0.74 mi N Brunswick/Dinwiddie CL, Begin Divided	
From Intersection:	0 Miles: Maint Bdy Dinwiddie Cnty;				
From Offset:	0MI	**From X/Y Coordinates:**		36.9458, -77.73358	
To Intersection:					
To Offset:	0MI	**To X/Y Coordinates:**		36.95676, -77.7295	
Public Comments:					
Street Names:	Boydton Plank Rd				

Item Code & Description	Detail	Len(mi)	Wid(ft)	Dep(in)	Gal/SqYd	Lbs/SqYd	Quantity	UOM
10417 - TACK COAT	PATCH						52	GAL
10417 - TACK COAT	TACK COAT						1041	GAL
16360 - ASPH. CONC. TY. SM-12.5E	Asphalt Quantities: Pavement Shoulder Wedge						7	TON
16360 - ASPH. CONC. TY. SM-12.5E	3 CROSSOVERS @ 2"						80	TON
16360 - ASPH. CONC. TY. SM-12.5E	MAINLINE	0.74	24	2		220	1146.11	TON
16360 - ASPH. CONC. TY. SM-12.5E	1 TURN LANE @ 2"	0.04	12	2		220	30.98	TON
16368 - PAVEMENT SHOULDER WEDGE PREP	Pavement Shoulder Wedge Prep.						3907	LF
16412 - NS ASPH. CONC. TY. IM-NS ASPH. CONC. TY. IM-19.0E (PATCH)	PATCHING @ 2"						57	TON
16515 - NS FLEXIBLE PAVEMENT PLANING Planing 0-2" (PATCH)	PATCHING @ 2"						521	SY
16522 - FLEXIBLE PAVE.PLANING 0"-2"	1 TURN LANE @ 2"	0.04	12	2			281.6	SY
16522 - FLEXIBLE PAVE.PLANING 0"-2"	MAINLINE	0.74	24	2			10419.2	SY
16522 - FLEXIBLE PAVE.PLANING 0"-2"	3 CROSSOVERS @ 2"						735	SY
54032 - TYPE B CLASS I PVMT LINE MRKG 4" - White	EDGE & SKIP LINES						5437	LF
54032 - TYPE B CLASS I PVMT LINE MRKG 4" - Yellow	EDGE LINE						3907	LF
54219 - INLAID PAVEMENT MARKER ASPHALT	INLAID PAVEMENT MARKERS -NEW INSTALLATION						49	EA
54428 - TEMP. PVMT MRKG, TY. A, 4"	TEMPORARY SKIP- TWO SETS						1953	LF

Notes:

Rideability Pay Factor is in effect for this item. INCENTIVE/DISINCENTIVE

Pavement shoulder wedge is required on right side only. 0.74 MILES IN LENGTH

Resources

1. Special Provision (SP315) - Pavement Shoulder Wedge
2. II&M (MD-002.1 & TE-391) - Pavement Shoulder Wedge: https://www.virginiadot.org/business/resources/IIM/TE-391_Pavement_Shoulder_Wedge.pdf
3. FAQ – Pavement Shoulder Wedge in 2020 Paving Contracts
4. FHWA's Safety Edge webpage https://safety.fhwa.dot.gov/safetyEdge/
5. Safety Effects of the Safety Edge: https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/safety_edge_techbrief.pdf

Questions?

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