
UDOT
Keeping Utah Moving

# Rumble Strip Preservation and Preservation Treatments

Travis Hansen, PE

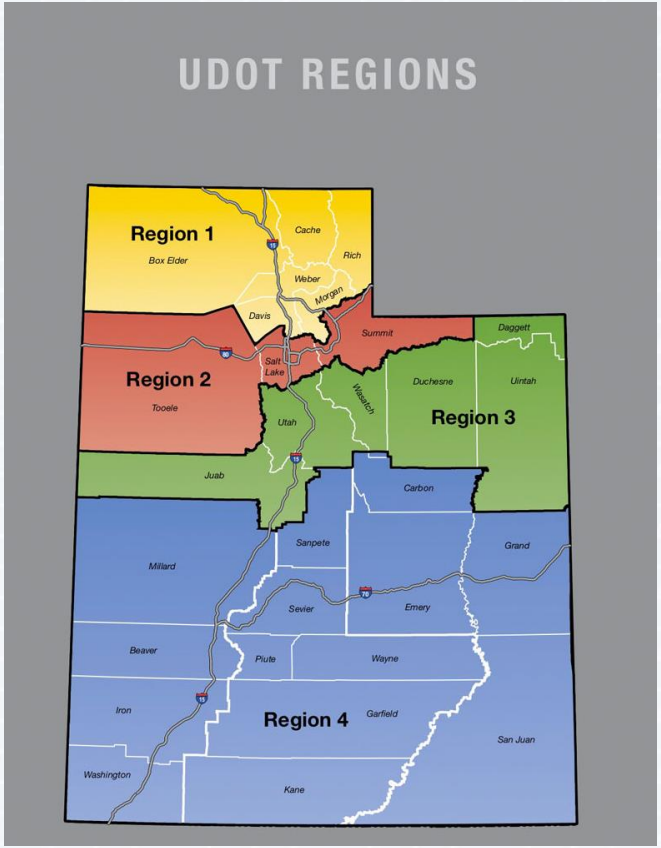
UDOT Region 4
Pavement Management Engineer

# Typical Pavement Preservation Projects in UDOT Region 4

Region 4 has a lot of rural routes with lower traffic volumes.

Rumble strips are an important safety feature in these areas.

Many of these roads only have centerline rumble strips because they have narrow shoulders.



# Typical Region 4 Pavement Preservation Projects

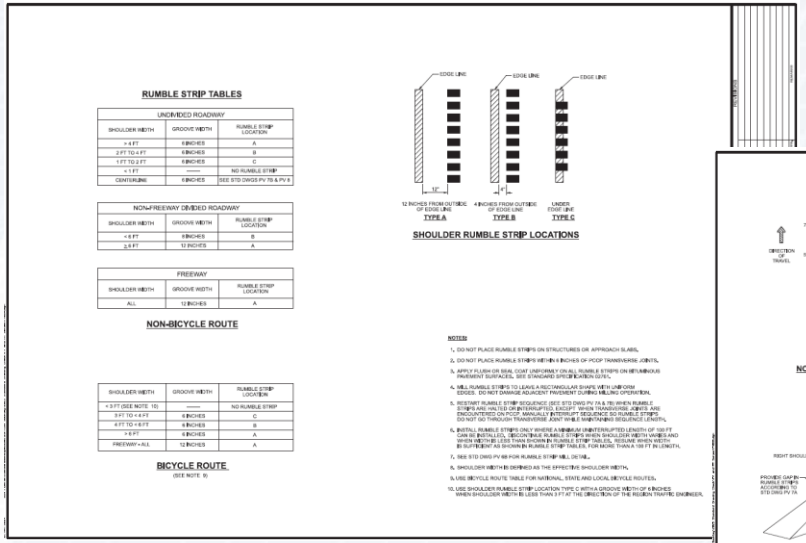
## Chip Seal

- Typically done on our rural roads with lower traffic volumes
  - Rumble strips installed before chip seal
    - Chip seal becomes the seal coat for rumble strips
    - Region 4 has allowed rumble strips to be sealed twice

## Micro Surface

- Used where we have higher traffic volumes and requiring work to be completed at night or where we need to open to traffic more quickly
  - Rumble strips are filled with micro surface then micro surface is applied to entire roadway
  - New rumble strips are re-ground and sealed with flush coat (typically an asphalt polymer treatment)

# Utah's Rumble Strip Standard Drawings



RUMBLE STRIP TABLES

| UNDIVIDED ROADWAY | | |
|---|---|---|
| SHOULDER WIDTH | GROOVE WIDTH | RUMBLE STRIP LOCATION |
| < 4 FT | 6 INCHES | A |
| 2 FT TO 4 FT | 6 INCHES | B |
| 1 FT TO 2 FT | 6 INCHES | C |
| < 1 FT | ——— | NO RUMBLE STRIP |
| CENTERLINE | 6 INCHES | SEE STD DWGS PV 7B & PV 8 |

| NON-FREEWAY DIVIDED ROADWAY | | |
|---|---|---|
| SHOULDER WIDTH | GROOVE WIDTH | RUMBLE STRIP LOCATION |
| < 6 FT | 6 INCHES | B |
| ≥ 6 FT | 12 INCHES | A |

| FREEWAY | | |
|---|---|---|
| SHOULDER WIDTH | GROOVE WIDTH | RUMBLE STRIP LOCATION |
| ALL | 12 INCHES | A |

NON-BICYCLE ROUTE

| | | |
|---|---|---|
| SHOULDER WIDTH | GROOVE WIDTH | RUMBLE STRIP LOCATION |
| < 3 FT (SEE NOTE 10) | ——— | NO RUMBLE STRIP |
| 3 FT TO < 4 FT | 6 INCHES | C |
| 4 FT TO < 6 FT | 6 INCHES | B |
| > 6 FT | 6 INCHES | A |
| FREEWAY + ALL | 12 INCHES | A |

BICYCLE ROUTE
(SEE NOTE 9)

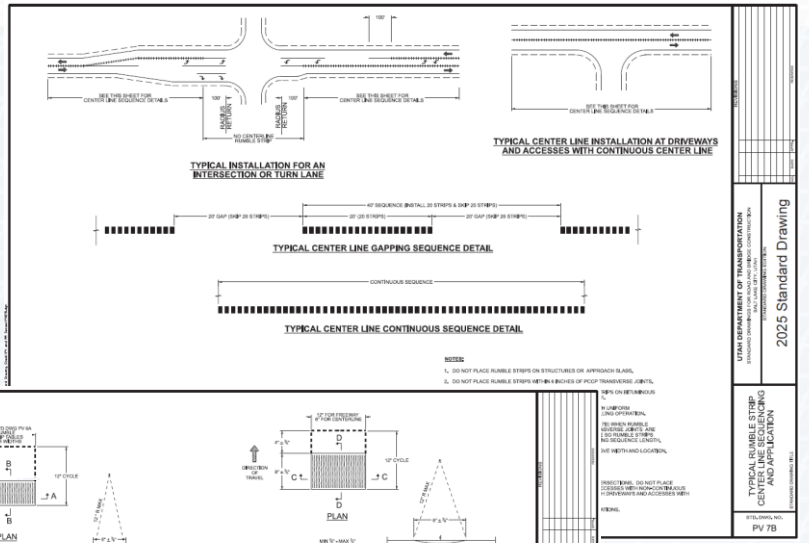
EDGE LINE

12 INCHES FROM OUTSIDE OF EDGE LINE — TYPE A
4 INCHES FROM OUTSIDE OF EDGE LINE — TYPE B
UNDER EDGE LINE — TYPE C

SHOULDER RUMBLE STRIP LOCATIONS

NOTES:
1. DO NOT PLACE RUMBLE STRIPS ON STRUCTURES OR APPROACH SLABS.
2. DO NOT PLACE RUMBLE STRIPS WITHIN 6 INCHES OF PCCP TRANSVERSE JOINTS.
3. APPLY FLUSH OR SEAL COAT UNIFORMLY ON ALL RUMBLE STRIPS ON BITUMINOUS PAVEMENT SURFACES. SEE STANDARD SPECIFICATION 02761.
4. MILL RUMBLE STRIPS TO LEAVE A RECTANGULAR SHAPE WITH UNIFORM EDGES. DO NOT DAMAGE ADJACENT PAVEMENT DURING MILLING OPERATION.
5. RESTART RUMBLE STRIP SEQUENCE (SEE STD DWG PV 7A & 7B) WHEN RUMBLE STRIPS ARE HALTED OR INTERRUPTED, EXCEPT WHEN TRANSVERSE JOINTS ARE ENCOUNTERED ON PCCP. MANUALLY INTERRUPT SEQUENCE SO RUMBLE STRIPS DO NOT GO THROUGH TRANSVERSE JOINT WHILE MAINTAINING SEQUENCE LENGTHS.
6. INSTALL RUMBLE STRIPS ONLY WHERE A MINIMUM UNINTERRUPTED LENGTH OF 100 FT CAN BE INSTALLED. DISCONTINUE RUMBLE STRIPS WHEN SHOULDER WIDTH VARIES AND WHEN WIDTH IS LESS THAN SHOWN IN RUMBLE STRIP TABLES. RESUME WHEN WIDTH IS SUFFICIENT AS SHOWN IN RUMBLE STRIP TABLES, FOR MORE THAN A 100 FT IN LENGTH.
7. SEE STD DWG PV 8B FOR RUMBLE STRIP MILL DETAIL.
8. SHOULDER WIDTH IS DEFINED AS THE EFFECTIVE SHOULDER WIDTH.
9. USE BICYCLE ROUTE TABLE FOR NATIONAL, STATE AND LOCAL BICYCLE ROUTES.
10. USE SHOULDER RUMBLE STRIP LOCATION TYPE C WITH A GROOVE WIDTH OF 6 INCHES WHEN SHOULDER WIDTH IS LESS THAN 3 FT AT THE DIRECTION OF THE RIDDEN TRAFFIC ENGINEER.

3. APPLY FLUSH OR SEAL COAT UNIFORMLY ON ALL RUMBLE STRIPS ON BITUMINOUS PAVEMENT SURFACES. SEE STANDARD SPECIFICATION 02761.



TYPICAL INSTALLATION FOR AN INTERSECTION OR TURN LANE

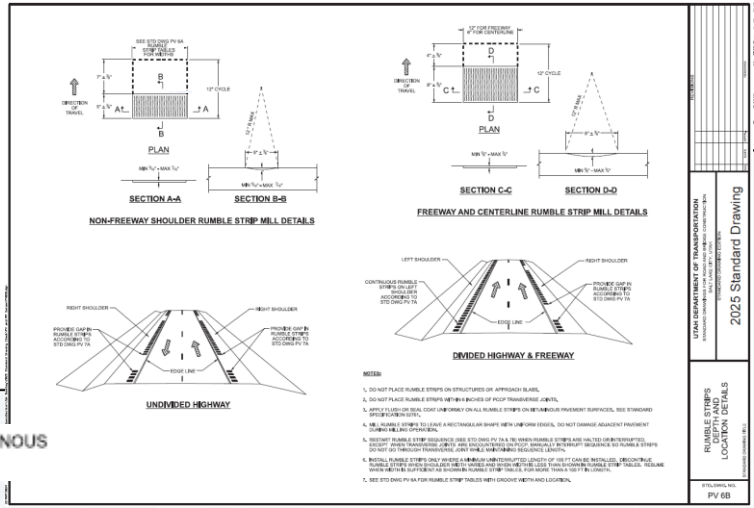
TYPICAL CENTER LINE INSTALLATION AT DRIVEWAYS AND ACCESSES WITH CONTINUOUS CENTER LINE

TYPICAL CENTER LINE GAPPING SEQUENCE DETAIL

TYPICAL CENTER LINE CONTINUOUS SEQUENCE DETAIL

NOTES:
1. DO NOT PLACE RUMBLE STRIPS ON STRUCTURES OR APPROACH SLABS.
2. DO NOT PLACE RUMBLE STRIPS WITHIN 6 INCHES OF PCCP TRANSVERSE JOINTS.

UTAH DEPARTMENT OF TRANSPORTATION
2025 Standard Drawing
TYPICAL RUMBLE STRIP CENTER LINE PLACING AND APPLICATION
STD. DWG. NO. PV 7B



SECTION A-A
SECTION B-B
NON-FREEWAY SHOULDER RUMBLE STRIP MILL DETAILS

SECTION C-C
SECTION D-D
FREEWAY AND CENTERLINE RUMBLE STRIP MILL DETAILS

UNDIVIDED HIGHWAY

DIVIDED HIGHWAY & FREEWAY

NOTES:
1. DO NOT PLACE RUMBLE STRIPS ON STRUCTURES OR APPROACH SLABS.
2. DO NOT PLACE RUMBLE STRIPS WITHIN 6 INCHES OF PCCP TRANSVERSE JOINTS.
3. APPLY FLUSH OR SEAL COAT UNIFORMLY ON ALL RUMBLE STRIPS ON BITUMINOUS PAVEMENT SURFACES. SEE STANDARD SPECIFICATION 02761.
4. MILL RUMBLE STRIPS TO LEAVE A RECTANGULAR SHAPE WITH UNIFORM EDGES. DO NOT DAMAGE ADJACENT PAVEMENT DURING MILLING OPERATION.
5. RESTART RUMBLE STRIP SEQUENCE (SEE STD DWG PV 7A & 7B) WHEN RUMBLE STRIPS ARE HALTED OR INTERRUPTED, EXCEPT WHEN TRANSVERSE JOINTS ARE ENCOUNTERED ON PCCP. MANUALLY INTERRUPT SEQUENCE SO RUMBLE STRIPS DO NOT GO THROUGH TRANSVERSE JOINT WHILE MAINTAINING SEQUENCE LENGTHS.
6. INSTALL RUMBLE STRIPS ONLY WHERE A MINIMUM UNINTERRUPTED LENGTH OF 100 FT CAN BE INSTALLED. DISCONTINUE RUMBLE STRIPS WHEN SHOULDER WIDTH VARIES AND WHEN WIDTH IS LESS THAN SHOWN IN RUMBLE STRIP TABLES. RESUME WHEN WIDTH IS SUFFICIENT AS SHOWN IN RUMBLE STRIP TABLES, FOR MORE THAN A 100 FT IN LENGTH.
7. SEE STD DWG PV 8A FOR RUMBLE STRIP TABLES WITH GROOVE WIDTH AND LOCATION.

UTAH DEPARTMENT OF TRANSPORTATION
2025 Standard Drawing
RUMBLE STRIPS GROOVE AND LOCATION DETAILS
STD. DWG. NO. PV 8B

LTDOT Keeping Utah Moving

# Region 4's Longitudinal Rumble Strip Specification

**SECTION 02761**

**LONGITUDINAL RUMBLE STRIP**

**3.1 INSTALLATION**

A. Install longitudinal rumble strip to the dimensions and spacing as shown in PV Series Standard Drawings.

1. Establish lane widths from plan set or existing roadway if not specified with plans, before installation of longitudinal rumble strip.
2. Install longitudinal rumble strip after the final wearing course except when project includes a Chip Seal Coat as the final wearing course.
   a. Apply Chip Seal Coat after rumble strip has been installed. The Chip Seal becomes the rumble strip seal.

F. Apply asphalt flush coat or seal coat, on Micro-surface, HMA and SMA surfaces after longitudinal rumble strips have been installed in the roadway. Apply asphalt flush coat or seal coat continuously, do not stop at breaks in rumble strips. Apply asphalt flush coat or seal coat a minimum of 6 inches wider than the grind on each side.

# Chip Seal Projects

Rumble strips are generally existing prior to preservation projects

Not an official policy but we generally allow 2 chip seals on rumble strips before considering need for re-grinding

Need to evaluate project by project to ensure they are currently functioning as intended and if another seal coat will be acceptable


# Region 4's Micro Surface Specification

**SECTION 02735**

**MICRO SURFACING**

I. Apply micro surfacing for rumble strip fill.
   1. Apply micro surfacing to fill existing rumble strips flush.
   2. Apply micro surfacing so there are no bumps or deviations in the final surface.
   3. Allow 24-hour cure time after filling ruts, before placing additional micro surfacing layer.

# Micro Surface Projects

Start by filling existing rumble strips with micro surface

Micro surface entire roadway

Grind new rumble strips

Seal with flush coat

# Micro Surface Test Projects

2023 Trial Projects to see if we could treat micro surface projects like chip seal projects and micro surface over the rumble strips without re-grinding

Test section on I-15 MP 173 to 179 (top photo)
- 80-mph, AADT=16,120
- Filled and re-ground in 2024

Test section on I-70 MP 155 to 163 (bottom photo)
- 80-mph, AADT=8,054
- Left in place, reported to have improved over time?

Possible factors: how deep were they before, were they cleaned prior to micro surface, subjective based on how they felt/sounded (not real scientific)

Decided to continue filling rumble strips and re-grinding with micro surface projects in the future


UDOT
Keeping Utah Moving