

# HBP OVERLAY SHOULDER TREATMENTS

---

## TYPICAL PROPOSED SECTIONS:

- Shoulders
- Sloughs
- Foreslopes

# AASHTO GUIDANCE ON SHOULDERS

---

- ❑ Measured from the edge of traveled way to the point of intersection of the shoulder slope and foreslope
- ❑ Flush with roadway surface
- ❑ Cross slope 2% to 6%
- ❑ “Roll-Over” 4% not to exceed 8% in superelevated sections

# DESIGN MANUAL GUIDANCE

## Design Memorandum No. 01-03

---

- Rural Two-Lane Roadways
  - TLO limited to 1 ½” or less except when intermittent patching of a greater lift is approved by management (1998 RRR & PMRRR)
  - Limited to 50 ton HBP per lane mile for leveling
  - Types of shoulder surfacing remain the same (Agg or HBP)
  - One PM TLO allowed per pavement life
  - Shoulder width
    - Follow 3R for two-lane roadways
    - Follow AASHTO for rural multi-lane highways and interstate.
  - Retention of existing features, except as required for shoulder width



# DESIGN MANUAL GUIDANCE

## Design Memorandum No. 02-01 – Cost Effectiveness

---

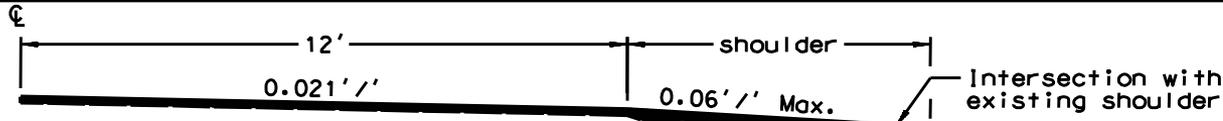
- Seal Coats (2-3 years)
  - Interstate - \$21,000/mi
  - Two-lane- \$15,000/mi
- Micro Surfacing (7-10 years)
  - \$50,000/mi
- TLO (7-10 years)
  - \$50,000/mi (two lanes, no shoulders)
- Milling (used to restore pavement cross section)
  - Two-lane - \$8,000/mi
- CPR (5-10 years) Two minor CPR's allowed
  - \$13,400/mi
- 10% Variance allowed

# DESIGN EXCEPTION REQUIREMENTS

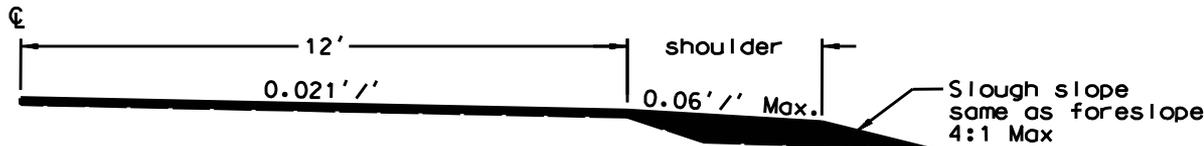
---

- Follow Design Memorandum No. 03-2003
- All projects, regardless of funding, must be examined to determine if a design exception is required.
- For PM projects (two-lane), no design exceptions are needed for the retention of existing substandard features, except as required for shoulder width.

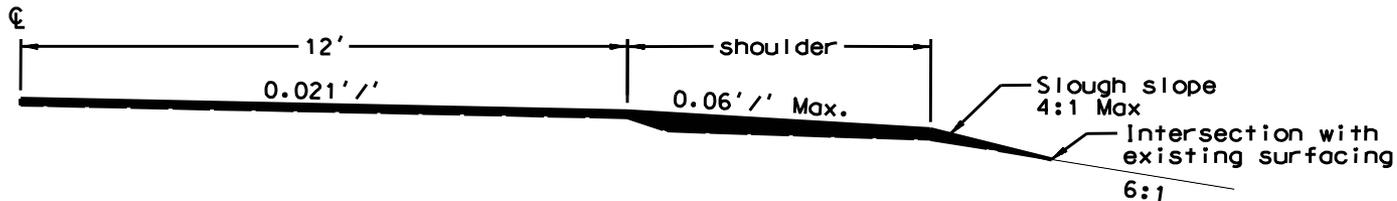
# PROPOSED SHOULDER TREATMENTS



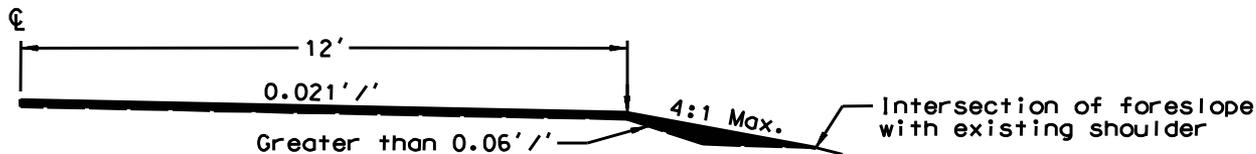
**METHOD ONE**  
Original shoulder width maintained



**METHOD TWO**  
Original shoulder width reduced



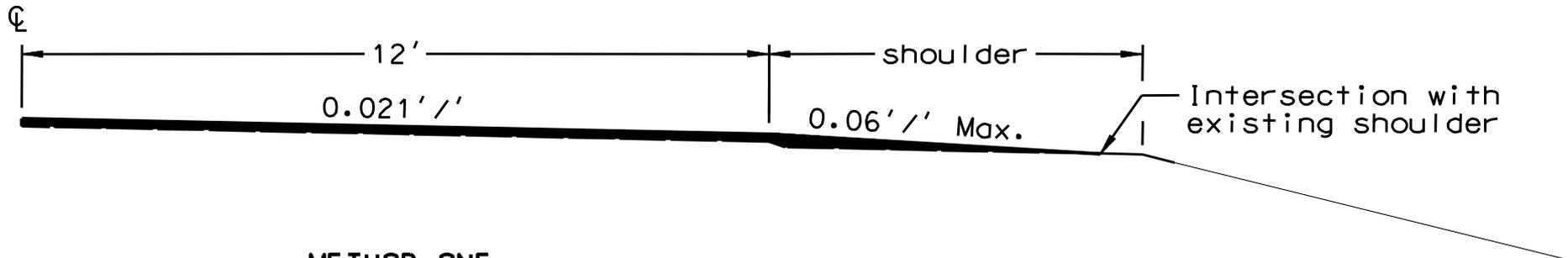
**METHOD THREE**  
Original shoulder width maintained



**METHOD FOUR**  
When no shoulder required

# PROPOSED SHOULDER & SLOUGH TREATMENTS

## METHOD ONE

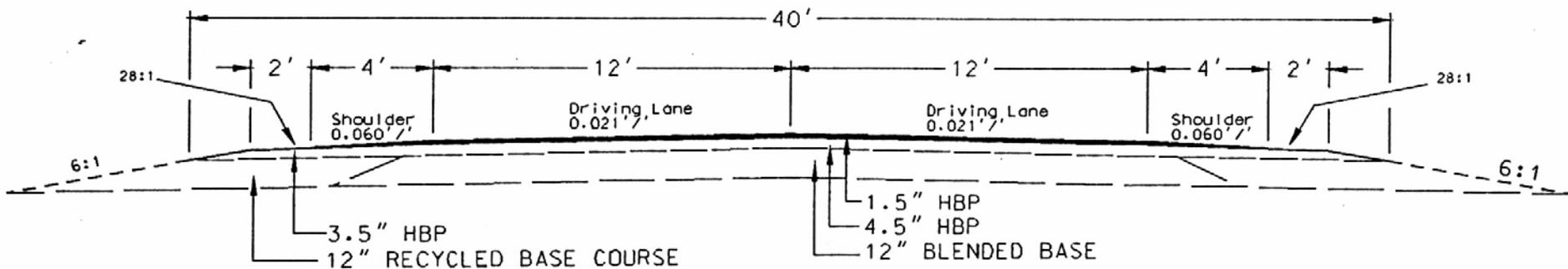


### METHOD ONE

Original shoulder width maintained

# EXAMPLE OF METHOD ONE

- ❑ SNH-6-081(060)169
- ❑ Traffic = 1760 ADT
- ❑ 3' shoulder required
- ❑ 6' shoulder maintained



CROSS SECTIONAL AREA  
3.600 SF

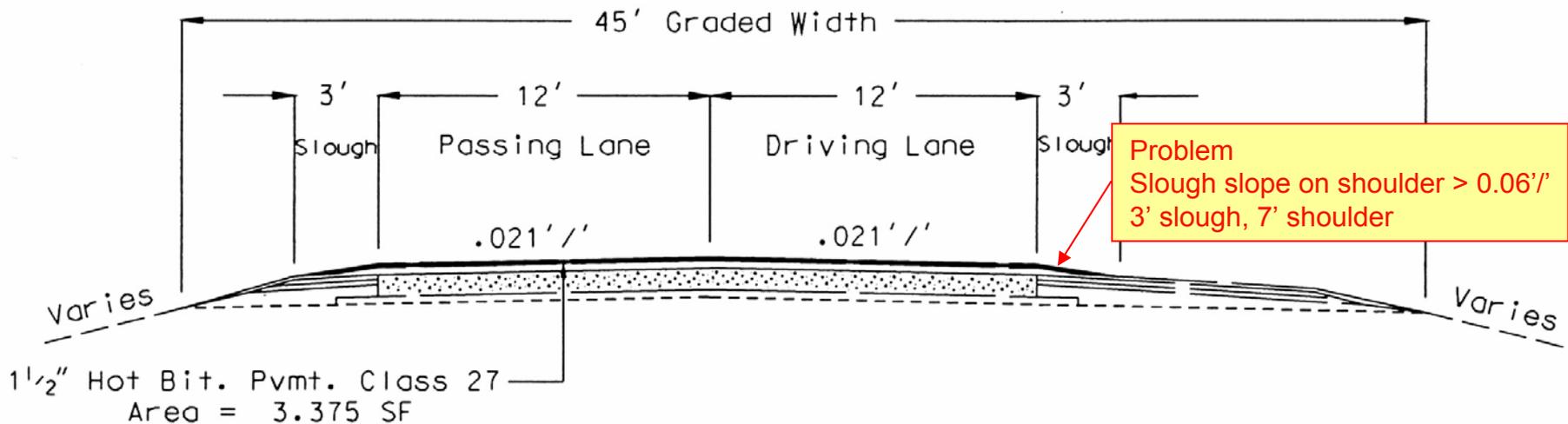
RP 169.619 to RP 175.023 and RP 175.174 to RP 175.239

TYPICAL PROPOSED SECTION

# SLOUGH SLOPE PROBLEM

- ❑ MDF-6-002(025)343
- ❑ Traffic = 9396 ADT
- ❑ 4' & 8' Shoulder required

TYPICAL PROPOSED SECTION



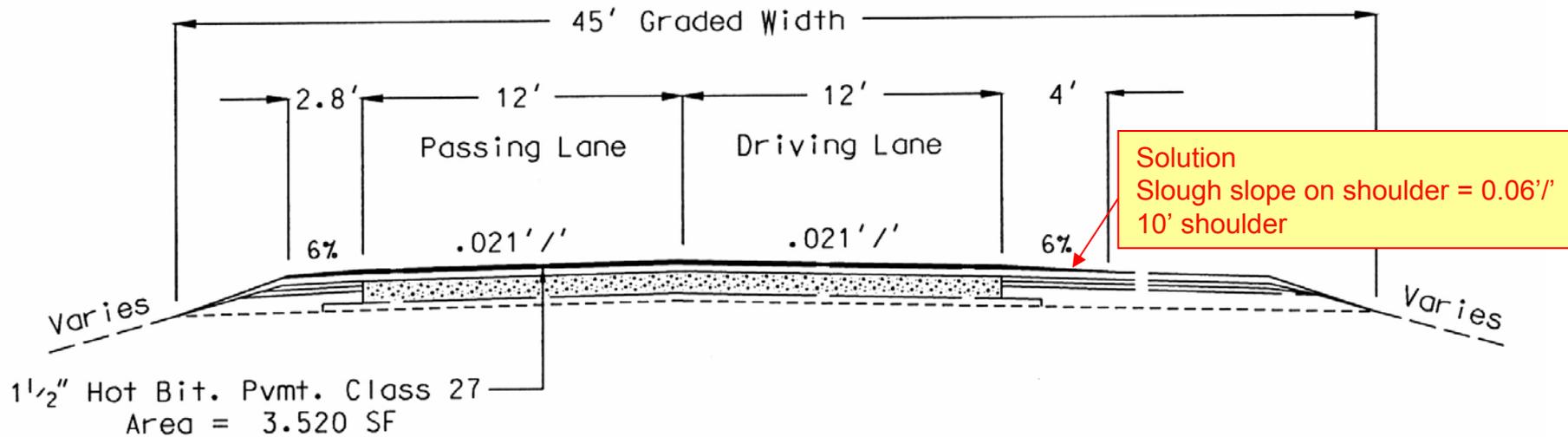
Typical Proposed Section

EB US 2 from RP 343.070 to RP 354.710

# SOLUTION

- ❑ MDF-6-002(025)343
- ❑ METHOD ONE
- ❑ Design Exception – LT shoulder

TYPICAL PROPOSED SECTION

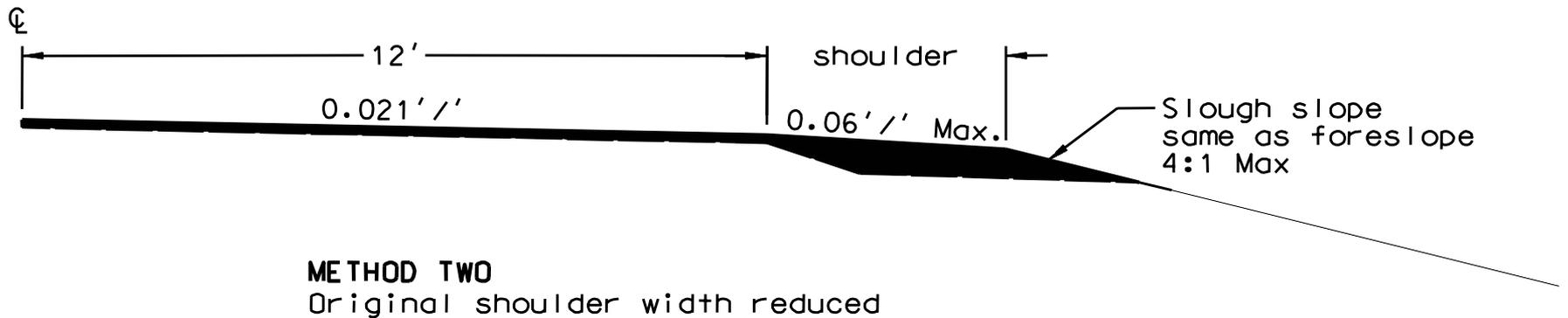


Typical Proposed Section

EB US 2 from RP 343.070 to RP 343.520

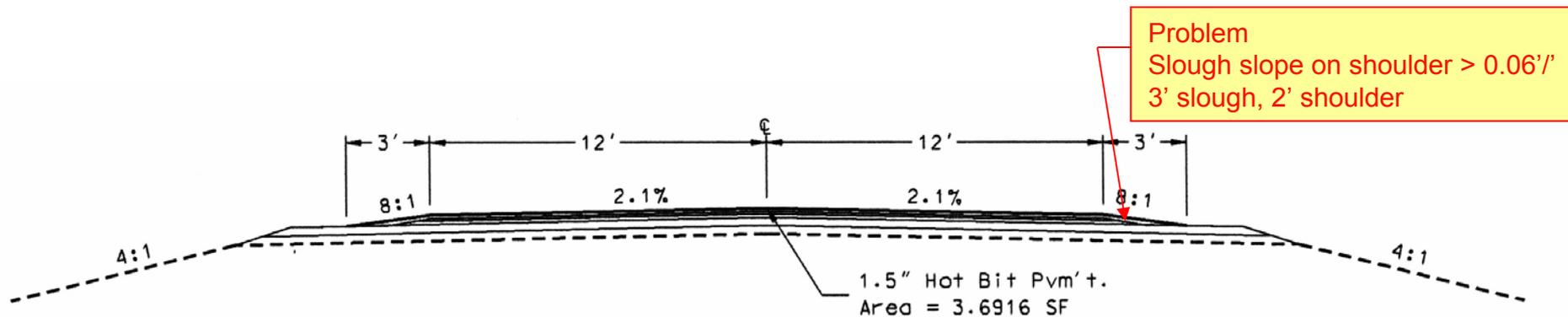
# PROPOSED SHOULDER & SLOUGH TREATMENTS

## METHOD TWO



# SLOUGH SLOPE PROBLEM

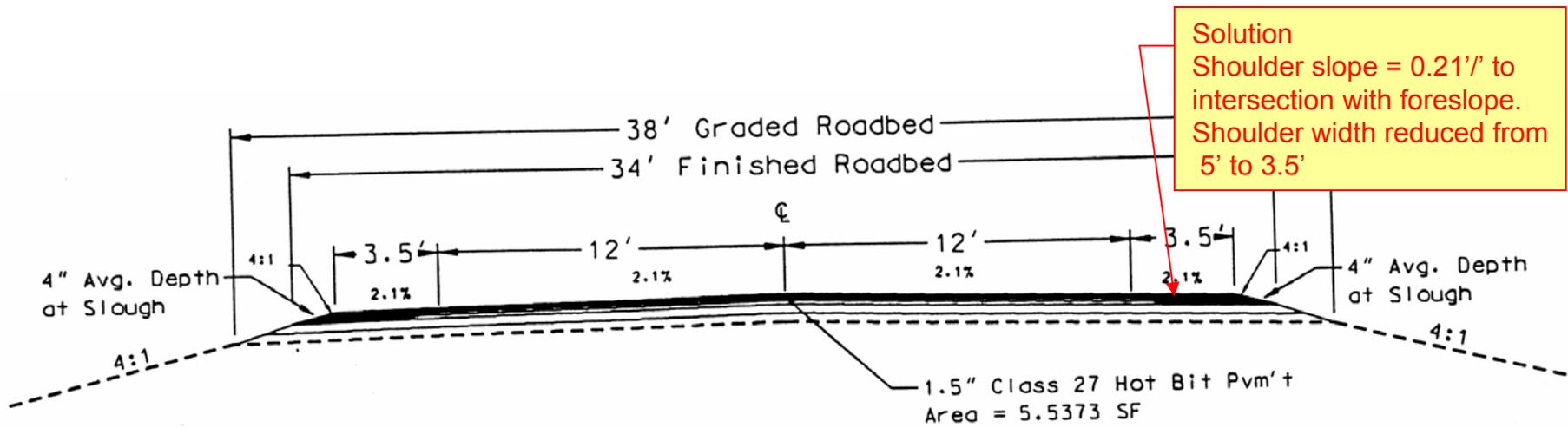
- SS-1-014(002)021
- Traffic = 350 ADT
- No shoulders required



RP 33.479 to RP 45.777

# SOLUTION

- SS-1-014(002)021
- METHOD TWO

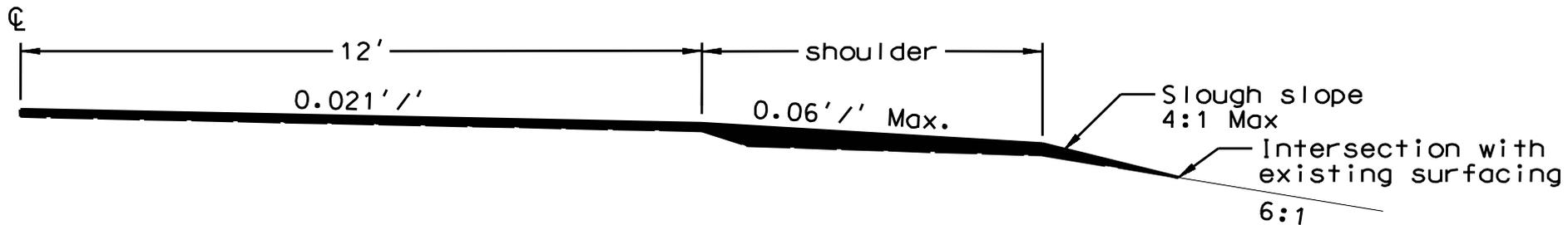


Solution  
Shoulder slope = 0.21' to intersection with foreslope.  
Shoulder width reduced from 5' to 3.5'

Tangent Section  
RP 33.479 to RP 45.777

# PROPOSED SHOULDER & SLOUGH TREATMENTS

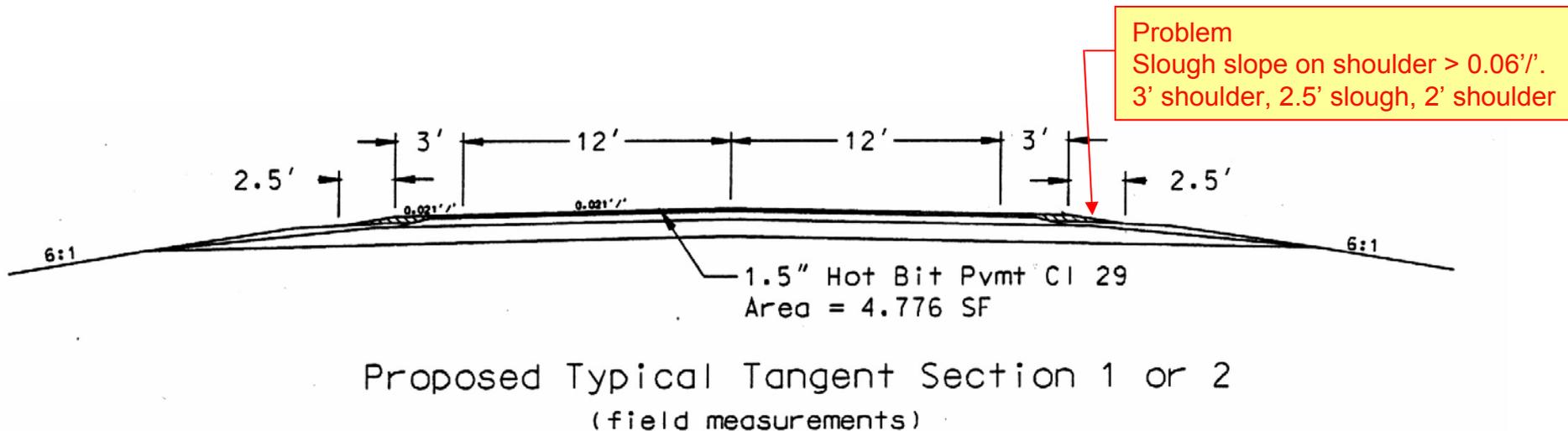
## METHOD THREE



**METHOD THREE**  
Original shoulder width maintained

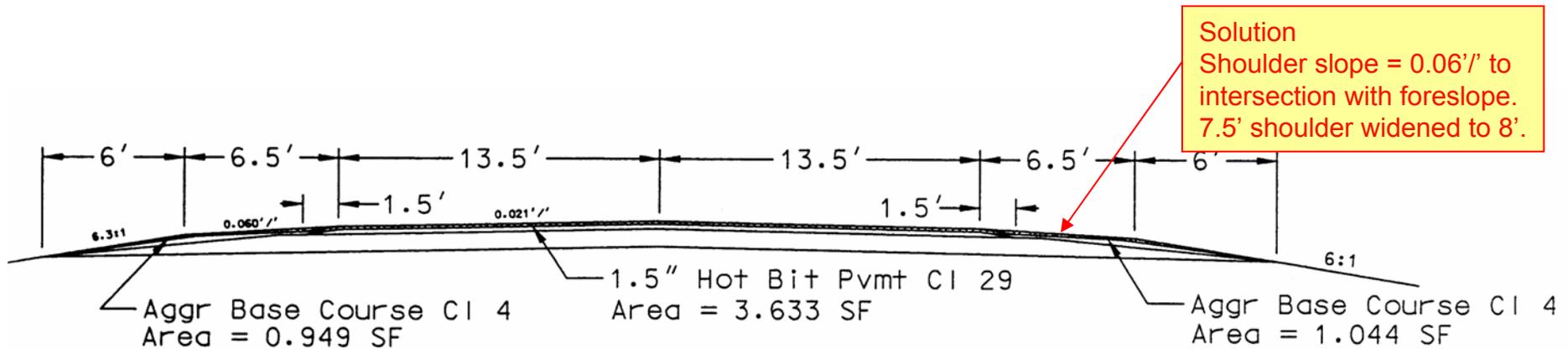
# SLOUGH SLOPE PROBLEM

- SNH-2-200(011)341
- Traffic = 1002 & 950
- 3' shoulder required



# SOLUTION

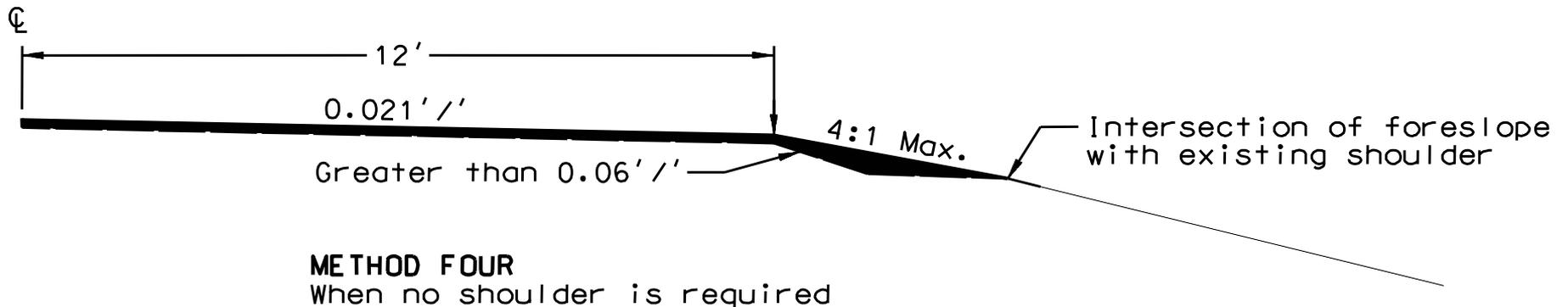
- SNH-2-200(011)341
- METHOD THREE



Proposed Typical - Tangent - Section 1

# PROPOSED SHOULDER & SLOUGH TREATMENTS

## METHOD FOUR



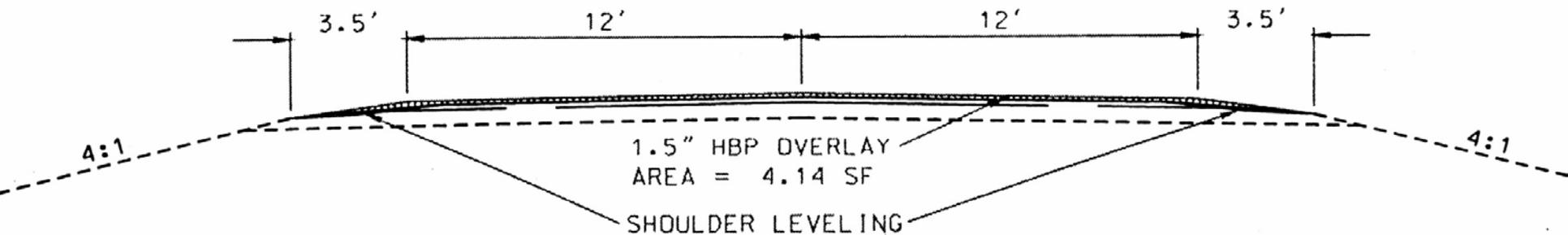
# EXAMPLE OF METHOD FOUR

- SNH-4-005(017)117
- Traffic = 997 ADT
- 3' shoulders required
- Design Exception required

## Typical Section 1

RP 117.570-119.759

RP 121.033-125.724

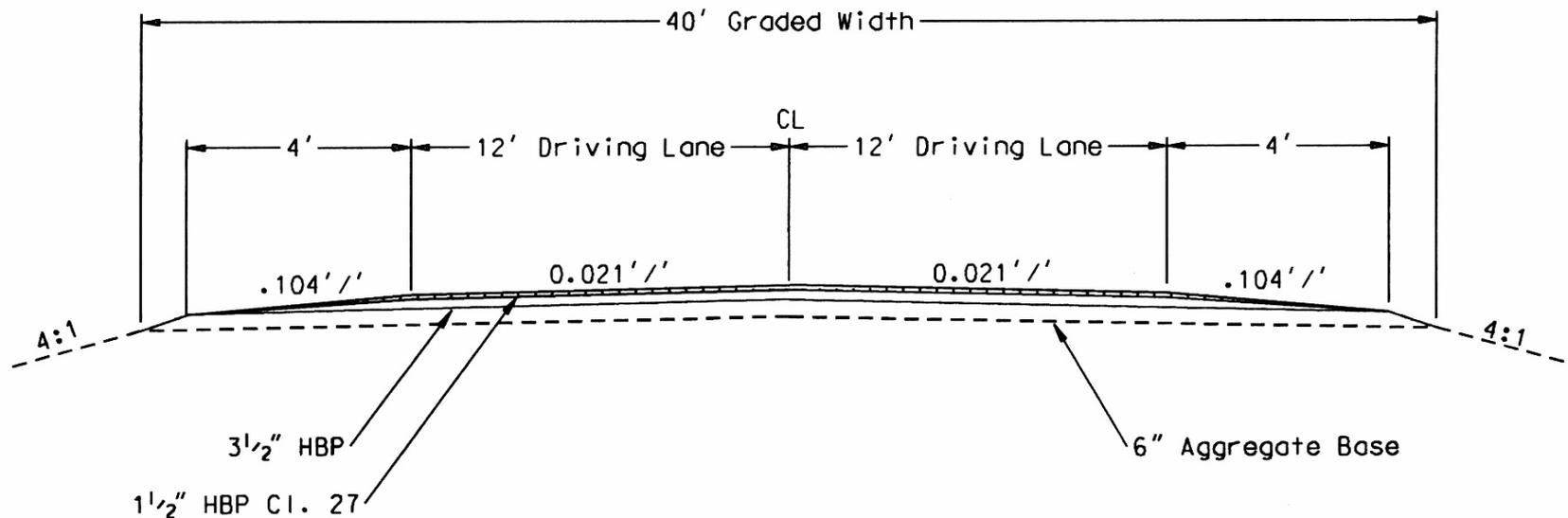


# EXAMPLE OF METHOD FOUR

- SS-5-022(067)125
- Traffic = 600 ADT
- No shoulders required

PROPOSED TYPICAL SECTION

RP 132.40 TO RP 140.89

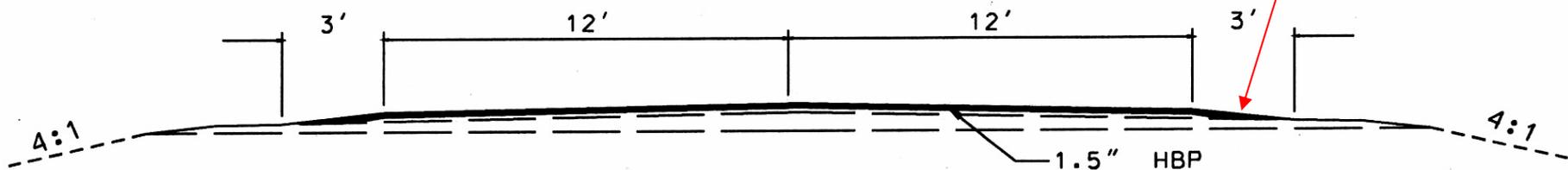


# SLOUGH SLOPE PROBLEM

- MDF-6-032(020)164
- Traffic = 563 ADT
- No shoulders required

Problem  
Slough slope on shoulder > 0.06'/.  
3' slough, 2' shoulder

## PROPOSED TYPICAL SECTION



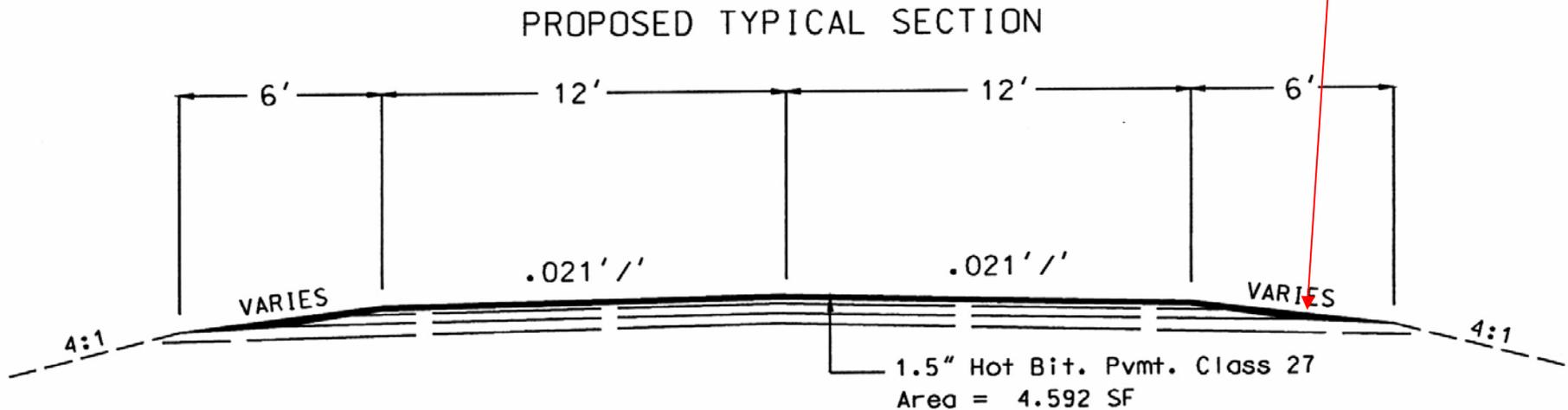
ND 32 FROM R.P. 164.200 TO R.P. 177.450

Area: = 3.375 SF

# SOLUTION

## □ METHOD FOUR

Solution  
6' slough from driving lane to  
edge of existing shoulder.  
Shoulder width reduced from  
5' to 0'.



ND 32 from R.P. 164.200 to R.P. 177.450

QUESTIONS???

---