

Project No.

PCN

RP 45, RP 47, and RP 48



Prepared by

**NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
BISMARCK, NORTH DAKOTA**

<http://www.dot.nd.gov/>

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SCOPING REPORT

Report Completed By: Logan Beise

A. GENERAL INFORMATION

Project Number: **PCN:**

District: Devils Lake

Location: RP 45, RP 47, RP 48

Reference Point: RP 44.89 to RP 45.05, RP 47.13 to RP 47.31, and RP 48.12 to RP 48.77 – 0.97 miles

Counties: Eddy

Legal Description:

RP 45: T149N, R63W, Sec 32 and T149N, R63W, Sec 29

RP 47: T149N, R63W, Sec 27 and T149N, R63W, Sec 26

RP 48: T149N, R63W, Sec 35 and T149N, R63W, Sec 36

Functional and Funding Roadway Classification: District Corridor

National Highway System: No

Speed Limit:

65 MPH

Project Schedule: Projects proposed to be added to the STIP in 2017.

B. PURPOSE, NEED, AND IMPROVEMENT

Purpose and Need of Project:

ND 15 from RP 44.89 to RP 48.77 experiences localized areas of concern. Water is encroaching on the roadway and clear zone is being lost. The district uses maintenance forces to provide temporary repairs. Three tied projects are proposed to address the areas.

Proposed Improvement:

Project 1, RP 45:

A Major Rehabilitation inslope widening with riprap, pipe replacement, and subcut is proposed. From RP 44.89 to RP 45.05, the north side of the roadway was widened in the past. Water is encroaching on the south side and deteriorating the inslope. It is proposed to widen the inslope on the south side to the clear zone and install riprap. A 48" centerline RCP exists at RP 44.891 and is failing. It is proposed to replace the pipe. Frost boils are also present at this location and it is proposed to subcut the damaged areas.

Project 2, RP 47:

A Major Rehabilitation inslope widening is proposed. From RP 47.13 to RP 47.29, water is encroaching on the north side and deteriorating the inslope. It is proposed to widen the inslope on the north side to the clear zone and install riprap.

Project 3, RP 48:

A Major Rehabilitation inslope widening with pipe extension is proposed. From RP 48.12 to RP 48.53, water is encroaching on the north side and deteriorating the inslope. It is proposed to widen the inslope on the north side to the clear zone and install riprap. From RP 48.66 to RP

48.77 water is encroaching on the south side and deteriorating the inslope. It is proposed to widen the inslope on the south side to the clear zone and install riprap. The 72" centerline RCP at RP 48.683 will require an extension.

C. TRAFFIC AND CRASH ANALYSIS

Traffic:

| | Year | Pass | Trucks | Total AADT | Flex ESALS | Rigid ESALS |
|------------------|------|------|--------|------------|------------|-------------|
| Current Traffic | 2015 | 305 | 50 | 355 | 40 | 65 |
| Forecast Traffic | 2035 | 415 | 65 | 480 | 50 | 85 |

Crash Analysis:

No crashes were reported within the project limits from 10/1/2010 to 9/30/2015.

D. EXISTING ROADWAY CHARACTERISTICS

| | International Roughness Index (IRI) | Distress Score | Rut |
|-----------|-------------------------------------|----------------|-----------------|
| Excellent | < =60 | ≥ 98 | < 0.25" |
| Good | 61 – 99 | 88 – 97 | 0.25" to 0.375" |
| Fair | 100 – 145 | 77 – 87 | 0.376" to 0.50" |
| Poor | > 145 | ≤ 76 | > 0.50" |

RP 43.590 to RP 45.317

| Actual Age | IRI | IRI Rating | SI or SCI | Faulting |
|---------------|----------|----------------|-----------|---------------|
| 3 | 73 | Good | 9 | N/A |
| Effective Age | Distress | Distress Score | Rutting | Rutting Score |
| 3 | 78 | Fair | 0.05 | Excellent |

| CONSTRUCTION HISTORY | | | | |
|----------------------|-----------------------|------------|------------|----------|
| Year | Construction | Depth (in) | Width (ft) | Oil |
| 1958 | RESHAPED | - | 32.0 | - |
| 1958 | EMULSIFIED BASE | 7.0 | 28.0 | SS-1 |
| 1978 | HOT BIT PAVEMENT | 1.5 | 24.0 | 200-300 |
| 1989 | DISTRICT CHIP SEAL | - | 24.0 | - |
| 1997 | DISTRICT CHIP SEAL | - | 24.0 | MC-3000 |
| 2009 | RIPRAP | - | - | - |
| 2012 | INT CONT PATCH-2.0" | 2.0 | 24.0 | PG 58-28 |
| 2014 | FEDERAL AID CHIP SEAL | - | 24.0 | CRS2P |

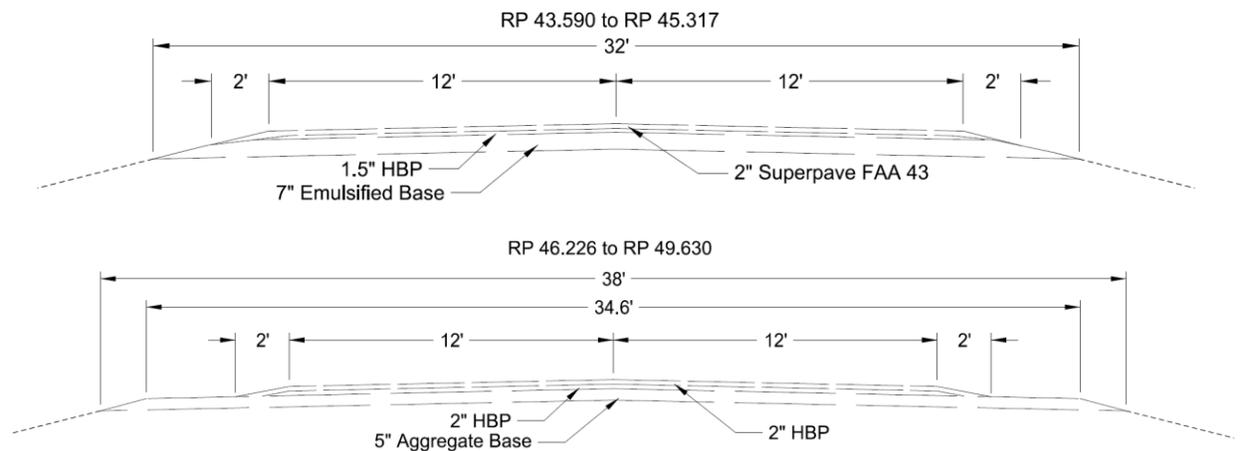
RP 46.226 to RP 49.630

| Actual Age | IRI | IRI Rating | SI or SCI | Faulting |
|---------------|----------|----------------|-----------|---------------|
| 3 | 77 | Good | 6 | N/A |
| Effective Age | Distress | Distress Score | Rutting | Rutting Score |
| 3 | 84 | Fair | 0.08 | Excellent |

| CONSTRUCTION HISTORY | | | | |
|----------------------|-----------------------|------------|------------|----------|
| Year | Construction | Depth (in) | Width (ft) | Oil |
| 1962 | GRADE | - | 38.0 | - |
| 1966 | AGGREGATE BASE | 5.0 | 34.0 | - |
| 1966 | HOT BIT PAVEMENT | 2.0 | 24.0 | 120-150 |
| 1985 | CONTRACT CHIP SEAL | - | 24.0 | MC-3000 |
| 2001 | DISTRICT CHIP SEAL | - | 24.0 | MC-3000 |
| 2005 | DISTRICT CHIP SEAL | - | 24.0 | MC-3000 |
| 2011 | HBP-SUPERPAVE-FAA 42 | 2.0 | 24.0 | PG 58-28 |
| 2012 | INT CONT PATCH-2.0" | 2.0 | 24.0 | PG 52-40 |
| 2014 | FEDERAL AID CHIP SEAL | - | 24.0 | CRS2P |

Existing Foreslopes: 4:1

Existing Typical Sections:



E. EXISTING GEOMETRY

Horizontal Curves: None.
Vertical Curves: Use existing.

F. EXISTING STRUCTURES

Bridges: None
Centerline Pipes: It is proposed to replace the 48" centerline RCP at RP 44.891. It is proposed to extend the 72" centerline RCP at RP 48.683.

Hydraulics should be investigated at all three locations to determine if additional drainage features are required at the project locations.

G. LAND INTERESTS

Communities: Entrance to Camp Grafton South, the Major General C. Emerson Murry Regional Live Fire and Maneuver Training Center is at RP 50.83.
Reservation: None
Surface Trust Land: None
Adjacent Land Usage: Agricultural

H. ISSUES AND APPURTENANCES CHECKLIST

- | | | |
|---|---|--|
| 1. Curb and Gutter? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 2. Sidewalk? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 3. Multi-Use Path? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 4. ADA Ramps? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 5. Detectable Warning Panels? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 6. Lighting? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 7. Signals? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 8. Storm Sewer? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 9. Manholes? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 10. Other Underground Work? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 11. Parking Facilities? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 12. Frontage Roads? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 13. Utility Issues? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 14. Landscaping? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 15. Approach or Ditch Block Flattening? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 16. T Intersection Recovery Approaches? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 17. Fence? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |
| <p>There is four strand barb wire fence along the ditch bottom at RP 47.1 to RP 47.3. It appears to have been placed in the right of way.</p> | | |
| 18. Railroad Crossings? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 19. Detours? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 20. Automatic Traffic Recorder Locations? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 21. Weigh-In-Motion Sites? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 22. ITS (Deicing, Snow Gates, VMS, RWIS, etc.)? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 23. Highway Patrol/Truck Pullouts or Rest Areas? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| 24. Additional Right of Way? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |

- | | | | | | |
|---|-----|-------------------------------------|----|-------------------------------------|--------------------------------|
| 25. Drainage Issues? | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | |
| 26. Snow Impact Areas? | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | |
| 27. Subgrade Issues? Subcut work is proposed at RP 45. | Yes | <input checked="" type="checkbox"/> | No | <input type="checkbox"/> | |
| 28. Noise Analysis: Type I Project? | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | Maybe <input type="checkbox"/> |
| 29. Maintenance Issues? | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | |
| 30. Guardrail? | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | |
| 31. Milling? | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | |
| 32. Local Road Safety Program | Yes | <input type="checkbox"/> | No | <input checked="" type="checkbox"/> | |

I. Load Restrictions

Travel Information Map Proposed Load Restriction: 7-Ton
HPCS Load Restrictions: 7-Ton
Projected Load Restrictions after project is complete: 7-Ton

J. Roadway Widths

Required: 28'

K. PERFORMANCE GUIDELINES

Design Speed: 65 mph
Clear Zone (from edge of driving lane): 20'
Ride/Distress Goal: Good
Operational Reliability: Moderate
Foreslopes: 4:1

L. PROPOSED IMPROVEMENTS

Project 1, RP 45:

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M. ADDITIONAL COMMENTS

District Engineer:

Project 1, RP 45:

The grade raise completed on the north side has protected the embankment from the water. The south side does not have the big fetch but has seen the slope deteriorate to the point that work is required before the embankment starts cutting into the roadway. The pipe in this area is separated near the middle of the westbound driving lane. The pipe was extended on the north when the grade raise was done. Most likely due to the separation and the water level there is also a frost heave in the same area. Even though this project is not a New/Reconstruction Investment Strategy, the pipe should be replaced during this project, due to the separation and also since a subcut may also be done at this pipe location. A 6:1 slope on the south side should be looked at as well as the standard 10:1 to determine which will have less impact and material cost. Below is the grade raise in this area completed on the north side of the road.

Project 2, RP 47:

The maintenance forces have had to do work in this area to protect the roadway from the water. Work should also include shoulder repair/ widening on the other side of the roadway as well. A 6:1 slope should be looked at as well as the standard 10:1 to determine which will have less impact and material cost.

Project 3, RP 48:

This area was also worked on by the maintenance forces to prevent the loss of the roadway section. The north side of the road should also be looked at to include repair or widening. A 6:1 slope should be looked at as well as the standard 10:1 to determine which will have less impact and material cost.

Decisions:

- 1) Which projects should advance?
 - . Yes Project 1
 - . Yes Project 2
 - . Yes Project 3

Safety Division Director: No comments.

N. COST ESTIMATE

(Inflation factor of 4% was used to estimate costs for bid year)

Project 1: RP 45

| ITEM | ESTIMATED COST |
|--|----------------|
| Contract Bond | \$2,000 |
| Mobilization | \$8,000 |
| Saw and Remove Pavement | \$5,000 |
| Topsoil | \$2,000 |
| Subcut | \$6,000 |
| Geotextile Fabric and Riprap | \$46,000 |
| Aggregate Base | \$20,000 |
| HBP | \$30,000 |
| Borrow | \$40,000 |
| Seeding, Mulching, and Erosion Control | \$10,000 |
| Traffic Control | \$10,000 |
| Centerline Pipe Replacement | \$25,000 |
| | |
| Subtotal | \$204,000 |
| 20% Engineering | \$41,000 |
| Construction and CE Total Cost | \$245,000 |

Project 2: RP 47

| ITEM | ESTIMATED COST |
|--|----------------|
| Contract Bond | \$1,000 |
| Mobilization | \$4,000 |
| Borrow | \$30,000 |
| Geotextile Fabric and Riprap | \$46,000 |
| Seeding, Mulching, and Erosion Control | \$10,000 |
| Topsoil | \$2,000 |
| Fence | \$2,000 |
| Traffic Control | \$10,000 |
| Subtotal | \$93,000 |
| | |
| 20% Engineering | \$21,000 |
| Construction and CE Total Cost | \$114,000 |

Project 3: RP 48

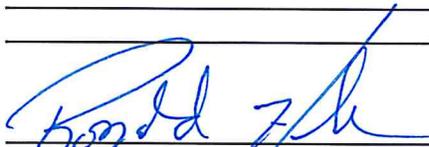
| ITEM | ESTIMATED COST |
|--|----------------|
| Contract Bond | \$2,000 |
| Mobilization | \$8,000 |
| Borrow | \$50,000 |
| Geotextile Fabric and Riprap | \$70,000 |
| Seeding, Mulching, and Erosion Control | \$20,000 |
| Topsoil | \$3,000 |
| Centerline Pipe Extension | \$15,000 |
| Traffic Control | \$12,000 |
| Subtotal | \$168,000 |
| 20% Engineering | \$40,000 |
| Construction and CE Total Cost | \$208,000 |

O. DECISIONS

1. Which projects should advance?

- * Project 1: RP 45 - Major Rehabilitation inslope widening with riprap, pipe replacement, and subcut. **Estimated Cost \$245,000**
- Project 2: RP 47 - Major Rehabilitation inslope widening. **Estimated Cost \$114,000**
- Project 3: RP 48 - Major Rehabilitation inslope widening with pipe extension. **Estimated Cost \$208,000**
- Option 4: Advance none.

DDE Comments: * Look option to relay and rehab.


 Deputy Director for Engineering

2/8/16
 Date