The Pavement Selection Committee met on August 10, 2021 to review the pavement design for the above referenced project. The approximately 0.53 mile long project involves complete replacement of the pavement.

The pavement design resulted in two options: 10" full-depth HMA and 9" jointed PCC. The life cycle cost analysis showed the options to be within 10% of each other; however, the District was recommending the use of concrete due to the commercial traffic and land use along the roadway. The committee discussed the issues along with performance of the current pavement and agreed with the District in the use of concrete.

In summary, the approved pavement design is:

**IL 40 - Replacement**
- 9" Jointed PCC with tied C&G
- 12" ASI

If you have any questions, please contact Mike Brand at (217) 782-7651.
FAP Route 646 (IL 40)  
Section 9TS & M-2  
Whiteside County  
P-92-001-08  
Contract No. 64D78

This project consists of the complete pavement reconstruction of IL 40 from North of LeFevre Rd. to Lynn Boulevard in Sterling.

Attached is the pavement selection analysis for the subject section. This section consists of approximately 16,250 square yards of new pavement for approximately 0.53 miles.

Mechanistic Pavement Design indicates that HMA pavement presents the lowest annual life cycle costs, providing a 4% annual cost savings versus a rigid pavement design. The recommended design consists of a 10" HMA full depth pavement.

However for the various reasons listed below the district would like to use the Rigid pavement thickness of 9".

- High truck traffic count with several industrial generators located North of project limits.
- 3 signalized intersections
- Numerous commercial entrances
- Being able to tie the concrete C&G to the pavement.
- Existing subgrade is very poor.
- Already approved pavement design favoring PCC Pavement
- City Of Sterling would like to see this portion PCC Pavement

If you have any questions or need additional information, please contact Brad Cushman at extension 815-284-996.
Reconstruction & Resurfacing IL 40 FROM 0.1 Mile North of Lynn Blvd. to 0.1 Mile South of LeFevre Rd. in Sterling.
TYPICAL SECTIONS

STA. 802+10.21 - 805+05.82

- CROWN LINE
- CURB AND GUTTER REMOVAL (TYP)
- PCC SIDEWALK 5" (TYP)
- SUB-BASE GRANULAR MATERIAL TYPE A 12" & VAR.
- COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.12

STA. 805+05.82 - 825+40.56

- CROWN LINE
- CURB AND GUTTER REMOVAL (TYP)
- PCC MULTI-USE PATH 5"
- EXISTING PAVEMENT REMOVAL
- PORTLAND CEMENT CONCRETE PAVEMENT 9" (JOINTED)
- SUB-BASE GRANULAR MATERIAL TYPE A 12" & VAR.
- TOPSOIL FURNISH AND PLACE 4" (TYP)
- PCC SIDEWALK 5"

PROTECTIVE COAT

If curb and gutter or PCC pavement is constructed before October 15th, the road will be open to traffic prior to the following April 15th. Protective coat shall be installed.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
TYPICAL SECTIONS

STA, 825+80.56 - 829+40

- TOPSOIL FURNISH AND PLACE 4" (TYP)
- PCC SIDEWALK 5"
- COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24 (TYP)
- SUB-BASE GRANULAR MATERIAL TYPE A 12" & VAR.
- EXISTING PAVEMENT REMOVAL
- PORTLAND CEMENT CONCRETE PAVEMENT 9" (JOINTED)
- Protective coat shall be installed. If curb and gutter or PCC pavement is constructed after September 15th, the road will be closed to traffic prior to the following April 1st. Protective coat shall be installed.
TYPICAL SECTIONS

MILLER RD,
STA. 998+409.71 - 999+040.93

- EXISTING PAVEMENT REMOVAL
- PORTLAND CEMENT CONCRETE PAVEMENT 9" (JOINTED)
- SUB-BASE GRANULAR MATERIAL, TYPE A 12" & VAR.
- COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24 (TYP)
- TOPSOIL FURNISH AND PLACE 4" (TYP)
- PORTLAND CEMENT CONCRETE SIDEWALK, 5" (TYP)

MILLER RD,
STA. 1001+33.69 - 1002+49.71

- CROWN LINE
- EXISTING PAVEMENT REMOVAL
- CURB AND GUTTER REMOVAL (TYP)
- PORTLAND CEMENT CONCRETE PAVEMENT 9" (JOINTED)
- SUB-BASE GRANULAR MATERIAL, TYPE A 12" & VAR.
- COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24 (TYP)
- TOPSOIL FURNISH AND PLACE 4" (TYP)
- PORTLAND CEMENT CONCRETE SIDEWALK, 5" (TYP)
**LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION**

**FULL-DEPTH HMA PAVEMENT**

ROUTE: FAP 646 (IL 40)  
SECTION: 9R & 9RS-3  
COUNTY: Whiteside  
LOCATION: Sterling

**FACILITY TYPE:** NON-INTERSTATE

<table>
<thead>
<tr>
<th>PROJECT LENGTH</th>
<th>2830 FT</th>
<th>= &gt;</th>
<th>0.54 Miles</th>
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<tbody>
<tr>
<td># OF CENTERLINES</td>
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<td></td>
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</tr>
<tr>
<td># OF LANES</td>
<td>3 LANES</td>
<td></td>
<td></td>
</tr>
<tr>
<td># OF EDGES</td>
<td>2 EP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LANE WIDTH - AVERAGE</td>
<td>12 FT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHOULDER WIDTH Left</td>
<td>0 FT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HMA Right</td>
<td>0 FT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Width of Paved Shoulders</td>
<td>0 FT</td>
<td></td>
<td></td>
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</table>

**PAVEMENT THICKNESS (FLEXIBLE)**  
10.00 IN  
14.75 IN MAX

**HMA OVERLAY THICKNESS**  
2.00 IN

**FLEX PAVEMENT TRAFFIC FACTORS**

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<tr>
<th>Minimum</th>
<th>Actual</th>
<th>Use</th>
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<tbody>
<tr>
<td>3.17</td>
<td>2.27</td>
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**INITIAL COSTS**

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<tr>
<th>ITEM</th>
<th>THICKNESS</th>
<th>100% QL</th>
<th>UNIT PRICE</th>
<th>COST</th>
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<tbody>
<tr>
<td>HMA PAVEMENT (FULL-DEPTH)</td>
<td>(10.00&quot;)</td>
<td>16250 SQ YD</td>
<td>*</td>
<td>$54.85/SQ YD</td>
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<tr>
<td>HMA SURFACE</td>
<td>2.00&quot;</td>
<td>1.0046 TONS</td>
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<td>$111.00/TON</td>
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<tr>
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<td>2.25&quot;</td>
<td>1.0145 TONS</td>
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<tr>
<td>HMA LOWER BINDER</td>
<td>5.75&quot;</td>
<td>1.0330 TONS</td>
<td>*</td>
<td>$92.00/TON</td>
</tr>
<tr>
<td>HMA SHOULDER</td>
<td>8.00&quot;</td>
<td>0 TONS</td>
<td>*</td>
<td>$0.00/TON</td>
</tr>
<tr>
<td>CURB &amp; GUTTER</td>
<td>8.00&quot;</td>
<td>6,926 LIN FT</td>
<td>*</td>
<td>$33.00/LIN FT</td>
</tr>
<tr>
<td>SUBBASE GRAN MATL TY C (TONS)</td>
<td>30 TONS</td>
<td></td>
<td></td>
<td>$0.00/TON</td>
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<tr>
<td>IMPROVED SUBGRADE: Aggregate Width = 51.7&quot;</td>
<td>16,250 SQ YD</td>
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<td>$20.00/SQ YD</td>
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<tr>
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<td>0 UNITS</td>
<td></td>
<td></td>
<td>$0.00/UNITS</td>
</tr>
<tr>
<td>PAVEMENT REMOVAL</td>
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<td>$11.00/SQ YD</td>
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<tr>
<td>SHOULDER REMOVAL</td>
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<td></td>
<td>$0.00/SQ YD</td>
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**MAINTENANCE COSTS:**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>THICKNESS</th>
<th>MATERIAL</th>
<th>T</th>
<th>UNIT COST</th>
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</thead>
<tbody>
<tr>
<td>ROUTINE MAINTENANCE ACTIVITY</td>
<td></td>
<td></td>
<td></td>
<td>$0.00 LANE-MILE / YEAR</td>
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<td>HMA OVERLAY PVMT SURF</td>
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<td>Surface N</td>
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<tr>
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<td>(2.00&quot;)</td>
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<td>2.00</td>
<td>$111.00/TON</td>
</tr>
<tr>
<td>HMA SURFACE MIX</td>
<td>(2.00&quot;)</td>
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<td>Surface N</td>
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</tr>
<tr>
<td>HMA BINDER MIX</td>
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<td>IL-9.5FG or IL-4.75</td>
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<td>HMA OVERLAY SHLD (Year 30)</td>
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<tr>
<td>HMA OVERLAY SHLD</td>
<td>(2.00&quot;)</td>
<td>1.0093</td>
<td>Shoulder</td>
<td>2.00</td>
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<tr>
<td>MILLING (2.00 IN)</td>
<td>2.00</td>
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<td>$2.25/SQ YD</td>
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<tr>
<td>PARTIAL DEPTH PVMT PATCH</td>
<td>(Mill &amp; Fill Surf)</td>
<td>Surface N</td>
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<td>$81.68/SQ YD</td>
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<tr>
<td>PARTIAL DEPTH SHLD PATCH</td>
<td>(Mill &amp; Fill Surf)</td>
<td>Shoulder</td>
<td>2.00</td>
<td>$69.25/SQ YD</td>
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<td>PARTIAL DEPTH PVMT PATCH</td>
<td>(Mill &amp; Fill +2.00&quot;)</td>
<td>Binder Mix</td>
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<tr>
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<td>Shoulder</td>
<td>2.00</td>
<td>$69.25/SQ YD</td>
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<tr>
<td>Description</td>
<td>Cost (per linear foot)</td>
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<tr>
<td>----------------------------------</td>
<td>------------------------</td>
<td></td>
<td></td>
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<tr>
<td>Longitudinal Shoulder Joint Rout &amp; Seal</td>
<td>$2.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centerline Joint Rout &amp; Seal</td>
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<td></td>
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<tr>
<td>Random / Thermal Crack Rout &amp; Seal</td>
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(100% Rehab) $2.00 / LIN FT

Total Flexible Life-Cycle Cost: $1,875,652
Total Flexible Annual Cost per Mile: $142,726
ROUTE: FAP 646 (IL 40)
SECTION: 9R & 9RS-3
COUNTY: Whiteside
LOCATION: Sterling

FACILITY TYPE: NON-INTERSTATE

PROJECT LENGTH: 2830 FT = 0.54 Miles
# OF CENTERLINES: 1 CL
# OF LANES: 3 Lanes
# OF EDGES: 2 EP
LANE WIDTH - AVERAGE: 12 FT
SHOULDER WIDTH:
  PCC Left: 0 FT
  PCC Right: 0 FT
  Total Width of Paved Shoulders: 0 FT

PAVEMENT THICKNESS (RIGID): JPCP 9.00 IN
SHOULDER THICKNESS: 9.00 IN

HMA OVERLAY THICKNESS: 2.75 IN

RIGID PAVEMENT TRAFFIC FACTORS:
Worksheet Construction Type is: New Construction
The Pavement Type is: JPCP

INITIAL COSTS:
<table>
<thead>
<tr>
<th>ITEM</th>
<th>THICKNESS</th>
<th>100% QUA UNIT</th>
<th>UNIT PRICE</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPC PAVEMENT</td>
<td>(9.00&quot;)</td>
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<td>$65.00 / SQ YD</td>
<td>$1,056,250</td>
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<td>PAVEMENT REINFORCEMENT</td>
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<td>$0.00 / SQ YD</td>
<td>$0</td>
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<tr>
<td>STABILIZED SUBBASE</td>
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<td>$0</td>
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<tr>
<td>PCC SHOULDERS</td>
<td>(9.00&quot; to 9.00&quot;)</td>
<td>0 SQ YD *</td>
<td>$0.00 / SQ YD</td>
<td>$0</td>
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<tr>
<td>CURB &amp; GUTTER</td>
<td>6,926 LIN FT *</td>
<td>$33.00 / LIN FT</td>
<td>$228,558</td>
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<td>SUBBASE GRAN MATL TY C</td>
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<td>$0.00 / TON</td>
<td>$0</td>
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<tr>
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<td>Width = 51.7&quot;</td>
<td>16,250 SQ YD *</td>
<td>$20.00 / SQ YD</td>
<td>$325,000</td>
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Reserved For User Supplied Item
  0 UNITS $0.00 / UNITS $0
  0 UNITS $0.00 / UNITS $0

PAVEMENT REMOVAL 7,232 SQ YD * $11.00 / SQ YD $79,552
SHOULDER REMOVAL 0 SQ YD * $0.00 / SQ YD $0

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION: $1,689,360
RIGID CONSTRUCTION: $128,550

MAINTENANCE COSTS:
<table>
<thead>
<tr>
<th>ITEM</th>
<th>THICKNESS</th>
<th>MATERIAL</th>
<th>T</th>
<th>UNIT COST</th>
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</thead>
<tbody>
<tr>
<td>ROUTINE MAINTENANCE ACTIVITY</td>
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<td></td>
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<td>$0.00 / LANE-MILE / YEAR</td>
</tr>
<tr>
<td>HMA OVERLAY</td>
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<tr>
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<td>Shoulder I 2.75</td>
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<tr>
<td>CLASS A PAVEMENT PATCHING</td>
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<td>$0.00 / SQ YD</td>
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<tr>
<td>CLASS B PAVEMENT PATCHING</td>
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<td>$165.00 / SQ YD</td>
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<td>PARTIAL DEPTH PVMT PATCH (Mill &amp; Fill HMA Surf)</td>
<td>Surface N 1.50</td>
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<tr>
<td>LONGITUDINAL SHOULDER JOINT RUT &amp; SEAL</td>
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<td></td>
<td>$2.00 / LIN FT</td>
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<tr>
<td>CENTERLINE JOINT RUT &amp; SEAL</td>
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<td>$2.00 / LIN FT</td>
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<tr>
<td>REFLECTIVE TRANSVERSE CRACK RUT &amp; SEAL</td>
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<td></td>
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<tr>
<td>RANDOM CRACK RUT &amp; SEAL</td>
<td>(100% Rehab = 100.00')</td>
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<td>$2.00 / LIN FT</td>
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RIGID TOTAL LIFE-C $1,950,760
RIGID TOTAL ANNUAL $148,441
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<thead>
<tr>
<th>LIFE-CYCLE COST ANALYSIS:  NEW DESIGN</th>
<th>Calculated / Rev</th>
<th>JPCP</th>
<th>HMA</th>
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<tr>
<td>CONSTRUCTION</td>
<td>INITIAL COST</td>
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<tr>
<td>PRESENT</td>
<td>$1,689,360</td>
<td>$1,504,982</td>
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<tr>
<td>ANNUAL CI</td>
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<td>MAINTENANCE</td>
<td>LIFE-CYCLE COST</td>
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<tr>
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LIFE-CYCLE COST ANALYSIS:  FINAL SUMMARY

LOWEST COST OPTION

OTHER OPTIONS (LOWEST TO HIGHEST):

TYPE / PEJPCP | $148,441 | 4.0%

S:\GEN\WPDOCS\Pavement Designs\D-2\IL 40 - LeFevre Rd to Lynn Blvd in Sterling - 64D78\Pavement Design - 64D78.xlsm\PDFSheets
<table>
<thead>
<tr>
<th>Year</th>
<th>Item Description</th>
<th>%</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost</th>
<th>Cost</th>
<th>Present Worth</th>
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<td>07</td>
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<td>$11,320</td>
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<tr>
<td></td>
<td>CNTR LINE JT R&amp;S</td>
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<td>Lin Ft</td>
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<td>$5,660</td>
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<tr>
<td></td>
<td>RNDM / THRMD CRCK R&amp;S</td>
<td>50%</td>
<td>4,670</td>
<td>Lin Ft</td>
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<td>$9,340</td>
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<tr>
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<td>PD PVMT PATCH M&amp;F SURF</td>
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<td>Lin Ft</td>
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<tr>
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<td>RNDM / THRMD CRCK R&amp;S</td>
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**Routine Maintenance Activity**

**1.61 Lane Miles**

**Maintenance Cost**

**370,670**

**Year Life Cycle**

**CRFn = 0.0407852**

**Maintenance Cost**

**$28,206**
MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

- JOINTED PLAIN CONCRETE PAVEMENT
- UNBONDED JOINTED PLAIN CONCRETE OVERLAY

Figure 54-7.A

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