The Pavement Selection Committee reviewed the design for the above referenced project which was most recently submitted on January 6, 2021. The project involves reconstruction of the I-55 interchange at IL 59. The existing, partial access interchange will be reconfigured to a diverging diamond to provide full access to I-55. I-55 to the north will be widened to provide a new auxiliary lane between IL 59 and US 52 in both directions. IL 59, Seil Road and the West Frontage Road will be reconstructed to provide additional channelization. Center Drive and I-55 Ramps will be reconstructed on new alignment.

Pavement designs were prepared for each of the roadway segments. The reconstruction of IL 59 was deemed a special design due to the volume of trucks. The district favored the use of a rigid pavement for IL 59 and the Committee concurred. The widening of I-55 was selected to be mechanistic full-depth HMA based upon a first cost analysis. The interchange ramps were selected as full-depth HMA to match the widening of I-55. The remaining segments were selected to be full-depth HMA based upon the life-cycle cost analysis showing the HMA to be more than 10% less expensive.

In summary, the approved pavement designs are:

**IL 59 - Reconstruction**
- 10” JPCP with tied C&G
- 12” ASI

**I-55 - Widening**
- 15” Full Depth HMA with HMA Shld
- 12” ASI

**I-55 Ramps - Reconstruction**
- 12.75” Full Depth HMA w/ HMA Shld
- 12” ASI
Seil Road & West Frontage Road - Reconstruction
10 ¼” Full Depth HMA w/ C&G
12” ASI

Center Drive/East Frontage Road - Reconstruction
9” Full Depth HMA w/ HMA Shids
12” ASI

If you have any questions, please contact Mike Brand at (217) 782-7651.
To: Jack Elston  
Attn: Michael Brand

From: Jose A. Dominguez  
By: Ojas Patel

Subject: Pavement Analysis*

Date: January 6, 2021

*Route: I-55 and IL 59  
Limits: IL 59 to US 52  
Section: 2018-075-R  
Current target: 09CY21

County: Will  
Contract No.: 62H15  
Job No.: D-91-368-18

We have completed the pavement analysis for the above captioned location. Review by the Central Office is required since the total pavement area for reconstruction exceeds 4,750 Square Yards. The following is the scope of the project:

Reconstruction/new construction of the IL 59 at I-55 interchange to provide full access. The interchange configuration will be a diverging diamond with connectivity to East Frontage Road/Center Drive. I-55 to the north will be widened to provide a new auxiliary lane between IL 59 and US 52 in both directions. IL 59, Seil Road and the West Frontage Road will be reconstructed to provide additional channelization. Center Drive and I-55 Ramps will be reconstructed on new alignment.

A 20-year pavement analysis was performed for the above roadway segments. Widening of I-55 will be full depth HMA based on the mechanistic pavement design procedure using a first cost analysis with the ramps matching the mainline pavement type per BDE Figure 54-1.A. IL Route 59 is a “High Stress” segment within the project limits and it is recommended to use PCC pavement. This segment of IL 59 consists of 4 high stress signalized intersections and numerous horizontal curves and approach grades greater than 3.5%.

For Seil Road, West Frontage Road, Center Drive/East Frontage Road, the life cycle cost analysis favors HMA pavement by more than 10%. The recommended pavement is:

**IL 59**
Reconstruction
PCC Curb and Gutter (Tied)
10” PCC Pavement (Jointed)
12” Aggregate Subgrade Improvement
I-55
Widening\textsuperscript{12}
HMA Shoulder
15" Full Depth HMA
- 2" Polymerized HMA Surface Course, SMA, 12.5, N80\textsuperscript{2}
- 2" Polymerized HMA Binder Course, SMA, 12.5, N80\textsuperscript{3}
- 11" HMA Base Course, IL-19.0, N90\textsuperscript{4}
12" Aggregate Subgrade Improvement\textsuperscript{11}

I-55 Ramps
Reconstruction\textsuperscript{12}
HMA Shoulder
12 ¾" Full Depth HMA
- 2" Polymerized HMA Surface Course, SMA, 9.5, N80\textsuperscript{5}
- 2 ¼" Polymerized HMA Binder Course, IL-19.0, N90\textsuperscript{6}
- 8 ½" HMA Base Course, IL-19.0, N90\textsuperscript{7}
12" Aggregate Subgrade Improvement\textsuperscript{11}

Seil Road & West Frontage Road\textsuperscript{13}
Reconstruction\textsuperscript{12}
Curb and Gutter
10 ¼" Full Depth HMA
- 2" Polymerized HMA Surface Course, Mix “E”, IL-9.5, N70\textsuperscript{8}
- 8 ¼" HMA Base Course, IL-19.0, N70\textsuperscript{9}
12" Aggregate Subgrade Improvement\textsuperscript{11}

Center Drive/East Frontage Road\textsuperscript{13}
Reconstruction\textsuperscript{12}
HMA Shoulder
9" Full Depth HMA
- 2" Polymerized HMA Surface Course, Mix “E”, IL-9.5, N70\textsuperscript{8}
- 7" HMA Base Course, IL-19.0, N70\textsuperscript{10}
12" Aggregate Subgrade Improvement\textsuperscript{11}

\textsuperscript{1}Designer Note 1: Use pay item \textbf{42000501}, PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED), 10” paid for in square yards.
2 Designer Note 2: Use pay item 40605036, POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, SMA, 12.5, Mix “F”, N80 paid for in tons.

3 Designer Note 3: Use pay item 40605015, POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, SMA, 12.5, N80 paid for in tons.

4 Designer Note 4: For widening of six feet or less use pay item 35600720 HOT-MIX ASPHALT BASE COURSE WIDENING, 11” paid for in square yards. For widening of greater than six feet use pay item 35501328 HOT-MIX ASPHALT BASE COURSE, 11” paid for in square yards.

5 Designer Note 5: Use pay item 40605026, POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, SMA, 9.5, Mix “F”, N80 paid for in tons.

6 Designer Note 6: Use pay item 40603240, POLYMERIZED HMA BINDER COURSE, IL-19.0, N90 paid for in tons.

7 Designer Note 7: Use pay item 35501318, HOT-MIX ASPHALT BASE COURSE, 8 ½”, paid for in square yards.

8 Designer Note 8: Use pay item 40604172, POLYMERIZED HMA SURFACE COURSE, MIX E, IL-9.5, N70 paid for in tons.

9 Designer Note 9: Use pay item 35501317, HOT-MIX ASPHALT BASE COURSE, 8 ¼”, paid for in square yards.

10 Designer Note 10: Use pay item 35501312, HOT-MIX ASPHALT BASE COURSE, 7”, paid for in square yards.

11 Designer Note 11: Use pay item 30300112, AGGREGATE SUBGRADE IMPROVEMENT, 12”, paid in square yards.

12 Designer Note 12: Refer to the District One, Bureau of Materials’ “Hot-Mix Asphalt – Mix Selection” tables to determine the corresponding HMA mix table requirements for the plans.

13 Designer Note 13: Seil Road and Center Drive is subject to local jurisdictional approval and concurrence.

If you have any questions or need additional information, please contact Ojas Patel, Pavement Design Engineer, at (847)705-4550.

By: Jose A. Dominguez
Jose A. Dominguez, P.E.
Project Support Engineer
EXISTING TYPICAL SECTION
SEIL RD
STA 4003+90 TO STA 4008+75

EXISTING TYPICAL SECTION
SEIL RD
STA 4012+79 TO STA 4014+08
STA 4015+38 TO STA 4018+17

EXISTING TYPICAL SECTION
SEIL RD
STA 4014+08 TO STA 4015+38

LEGEND

- EXISTING HMA PAVEMENT, 15.75"
- EXISTING CONCRETE CURB AND GUTTER
- EXISTING WITTEGRNDOE SHOULDER
- EXISTING AGGREGATE SHOULDER
- EXISTING CONCRETE MEDIAN
- EXISTING GUARDRAIL
- EXISTING RETAINING WALL
EXISTING TYPICAL SECTION

**E FRONTAGE RD**
STA 6006+42 TO STA 6050+16

**W FRONTAGE RD**
STA 5540+61 TO STA 5543+73

LEGEND
- EXISTING PC PAVEMENT, 9.75" JOINTED
- EXISTING HMA PAVEMENT, 17"
- EXISTING HMA SHOULDER, 6"
- EXISTING AGGREGATE SHOULDER
- EXISTING CONCRETE MEDIUM SURFACE, 5"
- EXISTING GUARDRAIL

EXISTING GUARDRAIL
EXISTING CONCRETE MEDIAN SURFACE, 5"
EXISTING AGGREGATE SHOULDER
EXISTING HMA SHOULDER, 6"
EXISTING HMA PAVEMENT, 17"
EXISTING PC PAVEMENT, 9.75"
PROPOSED TYPICAL SECTION

I-55
STA 288+00 TO STA 330+20

* Auxiliary lane cross slope is 2% or match adjacent lane 3 in super-elevated curve and transitions.

PROPOSED TYPICAL SECTION

I-55 (NORTHBOUND)
STA 319+50 TO STA 327+60

NOTES
1. At roadway locations with curb and gutter, the proposed guardrail face shall align with the back of curb.
2. See Hot-Mix Asphalt Mixture Requirements chart for mixture design.
3. Curb and gutter with reverse pitch gutter shall match the adjacent pavement lane slope.
4. Shared-use path shall be compliant with the Americans with Disabilities Act (ADA). For shared-use path the maximum running slope is 5%, maximum cross slope is 2%, and maximum ramp slope is 8.33%.
5. Side curb adjacent to PCC shared-use path may be removed in plan view if the 5 ft. and 10 ft. for Portland cement concrete curb-to-curb cross slope is 5°.
6. Transverse contraction joints in the PCC shared-use path shall be sawed into curbs and gutter but not into Portland cement concrete.
**NOTES**

1. **At roadway locations with curb and gutter, the proposed guardrail face shall align with the back of curb.**

2. **See hot-mix asphalt mixture requirements chart for mixture design.**

3. **Curb and gutter with reverse pitch gutter shall match the adjacent pavement lane slope.**

4. **Shared-use path shall be compliant with the Americans with Disabilities Act (ADA). For shared-use path the maximum running slope is 5%, maximum cross slope is 2%, and maximum ramp slope is 8.33%.**

5. **Curb and gutter adjacent to PCC shared-use path shall be measured in plan view.**

6. **Transverse contraction joints in the PCC shared-use path shall be formed not tooled.**

**PROPOSED TYPICAL SECTION**

**IL RTE 59**

5' STA 6992+38 to 5' STA 6999+58

*Additional thickness over 12" is included in the cost of the item.*
NOTES

1. AT ROADWAY LOCATIONS WITH CURB AND GUTTER, THE PROPOSED GUARDRAIL FACE SHALL ALIGN WITH THE BACK OF CURB.

2. SEE HOT-MIX ASPHALT MIXTURE REQUIREMENTS CHART FOR MIXTURE DESIGN.

3. CURB AND GUTTER WITH REVERSE PITCH GUTTER SHALL MATCH THE ADJACENT ROADWAY LANE SLOPE.

4. SHARED-USE PATH SHALL BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT (ADA). FOR SHARED-USE PATH THE MAXIMUM RUNNING SLOPE IS 5%, MAXIMUM CURB SLOPE IS 2%, AND MAXIMUM RAMP SLOPE IS 8.33%.

5. SIDE CURB ADJACENT TO PCC SHARED-USE PATH WILL BE MEASURED IN PLAN VIEW CROSS SLOPE IS 2%, AND MAXIMUM RAMP SLOPE IS 8.33%.

6. TRANSVERSE CONTRACTION JOINTS IN THE PCC SHARED-USE PATH SHALL BE SAWN NOT TOOLED.

7. HOT-MIX ASPHALT SHOULDER (FULL DEPTH), 15".

8. COMPACTED BASE (FULL DEPTH), 7.5".

9. PCC SHARED-USE PATH, 2".

10. PORTLAND CEMENT CONCRETE SHOULDER, 10".

11. AGGREGATE SHOULDER, TYPE B, 6".

12. AGGREGATE SHOULDER, TYPE B, 18".

13. LANDSCAPED MEDIAN.

14. STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH.

15. CONCRETE MEDIAN, TYPE SB (SPECIAL).

16. CONCRETE MEDIAN SURFACE, 5 INCH.

17. CONCRETE MEDIAN, TYPE SB (SPECIAL).

18. PORTLAND CEMENT CONCRETE MEDIAN (FULL DEPTH), 10".

19. AREA OF MEDIAN CONCRETE (FULL DEPTH), 10".

20. SCAFFOLDING AND PLACEMENT (1")

21. CONCRETE BARRIER, SINGLE FACE, 44 INCH HEIGHT.

22. CONCRETE BARRIER TRANSITION.

23. SEEDING.

24. TOPSOIL EXCAVATION AND PLACEMENT (5")

25. RETAINING WALL (SEE STRUCTURAL PLANS).

26. NOISE ABATEMENT WALL, GROUND MOUNTED.

27. HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70 (2").

28. PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 5 INCH.

29. AGGREGATE MEDIAN, TYPE B 10".

30. LANDSCAPED MEDIAN.

31. THE LEGEND WILHELMUS MAKING THE TRANSVERSE CONTRACTION JOINTS THE PCC SHARED USE PATH SHALL BE SAWN.
NOTES

1. AT ROADWAY LOCATIONS WITH CURB AND GUTTER, THE PROPOSED GUARDRAIL FACE SHALL ALIGN WITH THE BACK OF CURB.

2. SEE HOT-MIX ASPHALT MIXTURE REQUIREMENTS CHART FOR MIXTURE DESIGN.

3. CURB AND GUTTER WITH REVERSE PITCH GUTTER SHALL MATCH THE ADJACENT PAVEMENT LANE SLOPE.

4. SHARED-USE PATH SHALL BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT (ADA). FOR SHARED-USE PATH THE MAXIMUM RUNNING SLOPE IS 5%, MAXIMUM CROSS SLOPE IS 2%, AND MAXIMUM HANG SLOPE IS 8.33%.

5. SIDE CURBS ADJACENT TO PCC SHARED-USE PATH WILL BE MEASURED IN PLAN VIEW BY THE SQ FT AND PAID FOR AS PORTLAND CEMENT CONCRETE SIDEWALK, 5".

6. TRANSVERSE CONTRACTION JOINTS IN THE PCC SHARED-USE PATH SHALL BE SAWN BY THE SQ FT AND PAID FOR AS PORTLAND CEMENT CONCRETE SIDEWALK, 5".

7. SEE HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70 (2")

8. CONCRETE MEDIAN, TYPE SB (SPECIAL)

9. PORTLAND CEMENT CONCRETE SHOULDERS, 10"

10. HOT-MIX ASPHALT STABILIZATION B, STEEL PLATE BEAM GUARDRAIL

11. NOISE ABATEMENT WALL, GROUND MOUNTED

12. COMBINATION CONCRETE CURB AND GUTTER, TYPE M-4.24

13. AGGREGATE SUBGRADE IMPROVEMENT, 12"

14. PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)

15. LANDSCAPED MEDIAN

16. STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH

17. CONCRETE MEDIAN, TYPE SB (SPECIAL)

18. PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 5 INCH

19. CONCRETE MEDIAN, TYPE SB (SPECIAL)

20. HOT-MIX ASPHALT PAVEMENT (FULL DEPTH), 15"

21. HOT-MIX ASPHALT SHOULDER, 12.75"

22. HOT-MIX ASPHALT PAVEMENT (FULL DEPTH), 10.25"

23. PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)

24. STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH

25. COMBINATION CONCRETE CURB AND GUTTER, TYPE M-4.24

26. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-9.24

27. CONCRETE MEDIAN SURFACE, 5 INCH

28. PORTLAND CEMENT CONCRETE SHARED-USE PATH (5")

29. CONCRETE BARRIER, SINGLE FACE, 44 INCH HEIGHT

30. PORTLAND CEMENT CONCRETE SHARED-USE PATH (5")

31. CONCRETE BARRIER WALL (SPECIAL)

32. HOT-MIX ASPHALT SHOULDER, 12.75"

33. CONCRETE BARRIER TRANSITION

34. RETAINING WALL (SEE STRUCTURAL PLANS)

35. SEEDING

36. TILLSOL EXCAVATION AND PLACEMENT (5")

37. TILLSOL EXCAVATION AND PLACEMENT (5")

38. PORTLAND CEMENT CONCRETE SHOULDERS, 10"

39. HOT-MIX ASPHALT STABILIZATION B, STEEL PLATE BEAM GUARDRAIL

40. CONCRETE MEDIAN SURFACE, 5 INCH

41. PORTLAND CEMENT CONCRETE SHARED-USE PATH (5")

42. HOT-MIX ASPHALT SHOULDER, 12.75"

43. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24

44. PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH

45. STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH

46. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24

47. PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH

48. PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH

49. NOISE ABATEMENT WALL, GROUND MOUNTED

50. HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N78 (2")

51. SCALPEL EDGE, 0.125" THICK
NOTES
1. AT ROADWAY LOCATIONS WITH CURB AND GUTTER, THE PROPOSED GUARDRAIL FACE SHALL ALIGN WITH THE BACK OF CURB.
2. SEE HOT-MIX ASPHALT MIXTURE REQUIREMENTS CHART FOR MIXTURE DESIGN.
3. CURB AND GUTTER WITH REVERSE PITCH GUTTER SHALL MATCH THE ADJACENT PAVEMENT LANE SLOPE.
4. SHARED-USE PATH SHALL BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT (ADA). FOR SHARED-USE PATH THE MAXIMUM RUNNING SLOPE IS 5%, MAXIMUM CROSS SLOPE IS 2%, AND MAXIMUM RAMP SLOPE IS 8.33%.
5. SIDE CURB ADJACENT TO PCC SHARED-USE PATH WILL BE MEASURED IN PLAN VIEW.
6. TRANSVERSE CONTRACTION JOINTS IN THE PCC SHARED-USE PATH SHALL BE SAWED BY THE SQ FT AND PAID FOR AS PORTLAND CEMENT CONCRETE SIDEWALK, 5".
7. PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)
8. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 12.75"
9. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 10.25"
10. AGGREGATE SUBLANCE IMPROVEMENT, 12"
11. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24
12. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-9.24
13. COMBINATION CONCRETE CURB AND GUTTER, TYPE M-4.24
14. PORTLAND CEMENT CURB AND GUTTER, 15"
15. AGGREGATE SHOULDERS, TYPE B-15"
16. LANDSCAPED MEDIAN
17. STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH
18. CONCRETE MEDIAN, TYPE SR (SPECIFIC)
19. CONCRETE MEDIAN SURFACE, 3 INCH
20. HOT-MIX ASPHALT SHARED-USE PATH (4")
21. PORTLAND CEMENT CONCRETE SHARED USED PATH (5")
22. SUBBASE GRANULAR MATERIAL, TYPE B-6"
23. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 12"
24. STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS
25. HOT-MIX ASPHALT STABILIZATION 8" AT STEEL PLATE BEAM GUARD RAIL
26. CONCRETE BARRIER, SINGLE FACE, 44 INCH HEIGHT
27. CONCRETE BARRIER WALL, (SPECIFIC)
28. HOT-MIX ASPHALT SHOULDER, 15"
29. CONCRETE BARRIER TRANSITION
30. RETAINING WALL (SEE STRUCTURAL PLANS)
31. SEEDING
32. TOPSOIL EXCAVATION AND PLACEMENT (5")
33. TOPSOIL EXCAVATION AND PLACEMENT (30")
34. NOISE ABATEMENT WALL, GROUND MOUNTED
35. HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70 (2")
36. PORTLAND CEMENT CONCRETE SHARED USED PATH (5")
37. SUBBASE GRANULAR MATERIAL, TYPE B 6"
38. HOT-MIX ASPHALT PAVEMENT (FULL DEPTH), 15"
39. STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS
40. HOT-MIX ASPHALT STABILIZATION 6" AT STEEL PLATE BEAM GUARD RAIL
41. CONCRETE BARRIER WALL (SPECIAL)
42. HOT-MIX ASPHALT SHOULDER, 15"
43. CONCRETE BARRIER TRANSITION
44. RETAINING WALL (SEE STRUCTURAL PLANS)
45. SEEDING
46. TOPSOIL EXCAVATION AND PLACEMENT (5")
47. TOPSOIL EXCAVATION AND PLACEMENT (30")
48. NOISE ABATEMENT WALL, GROUND MOUNTED
49. HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70 (2")

CONTRACT NO. 10730000  PROJECT NO. 62H15 * FAI 55, FAP 338

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROPOSED TYPICAL SECTION
RAMP A
STA 904+55 TO STA 907+85

PROPOSED TYPICAL SECTION
RAMP A
STA 910+38 TO STA 913+60

PROPOSED TYPICAL SECTION
RAMP A
STA 907+65 TO STA 910+38

LEGEND
1. PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)
2. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 12.75"
3. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 10.25"
4. AGGREGATE SUBLANCE IMPROVEMENT, 12"
5. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24
6. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-9.24
7. COMBINATION CONCRETE CURB AND GUTTER, TYPE M-4.24
8. PORTLAND CEMENT CURB AND GUTTER, 15"
9. AGGREGATE SHOULDERS, TYPE B-15"
10. LANDSCAPED MEDIAN
11. STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE, 6 INCH
12. CONCRETE MEDIAN, TYPE SR (SPECIFIC)
13. CONCRETE MEDIAN SURFACE, 3 INCH
14. HOT-MIX ASPHALT SHARED-USE PATH (4")
15. PORTLAND CEMENT CONCRETE SHARED USED PATH (5")
16. SUBBASE GRANULAR MATERIAL, TYPE B-6"
17. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 12"
18. STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS
19. HOT-MIX ASPHALT STABILIZATION 8" AT STEEL PLATE BEAM GUARD RAIL
20. CONCRETE BARRIER, SINGLE FACE, 44 INCH HEIGHT
21. CONCRETE BARRIER WALL, (SPECIFIC)
22. HOT-MIX ASPHALT SHOULDER, 15"
23. CONCRETE BARRIER TRANSITION
24. RETAINING WALL (SEE STRUCTURAL PLANS)
25. SEEDING
26. TOPSOIL EXCAVATION AND PLACEMENT (5")
27. TOPSOIL EXCAVATION AND PLACEMENT (30")
28. NOISE ABATEMENT WALL, GROUND MOUNTED
29. HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70 (2")

Default
pw://benesch-pw.bentley.com:benesch-pw-01/Documents/10700s/10740.00/Eng_Docs_Phase_II/Roadway/Typical_Sections/D162H15-sht-typical-pr-rampA-01.dgn

FILE NAME:
MODEL:

DEPARTMENT OF TRANSPORTATION
STATE OF ILLINOIS

1349
WILL
2018-075-R
62H15*

I/P
FAI 55, FAP 338
12/04/2020

PROPOSED TYPICAL SECTION
RAMP A
STA 904+55 TO STA 907+85

PROPOSED TYPICAL SECTION
RAMP A
STA 910+38 TO STA 913+60

PROPOSED TYPICAL SECTION
RAMP A
STA 907+65 TO STA 910+38

NOT TOOLED.
6. TRANSVERSE CONTRACTION JOINTS IN THE PCC SHARED-USE PATH SHALL BE SAWED BY THE SQ FT AND PAID FOR AS PORTLAND CEMENT CONCRETE SIDEWALK, 5".
5. SIDE CURB ADJACENT TO PCC SHARED-USE PATH WILL BE MEASURED IN PLAN VIEW.
4. SHARED-USE PATH SHALL BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT (ADA). FOR SHARED-USE PATH THE MAXIMUM RUNNING SLOPE IS 5%, MAXIMUM CROSS SLOPE IS 2%, AND MAXIMUM RAMP SLOPE IS 8.33%.
**NOTES**

1. AT ROADWAY LOCATIONS WITH CURB AND GUTTER, THE PROPOSED GUARDRAIL FACE SHALL ALIGN WITH THE BACK OF CURB.

2. SEE HOT-MIX ASPHALT MIXTURE REQUIREMENTS CHART FOR MIXTURE DESIGN.

3. CURB AND GUTTER WITH REVERSE PITCH GUTTER SHALL MATCH THE ADJACENT PAVEMENT LANE SLOPE.

4. SHARED-USE PATH SHALL BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT (ADA). FOR SHARED-USE PATH THE MAXIMUM RUNNING SLOPE IS 5%, MAXIMUM CROSS SLOPE IS 2%, AND MAXIMUM RAMP SLOPE IS 8.33%.

5. DRAWINGS CONFORM TO FEDERAL AID PROJECT NO. 55, FEDERAL AID PROGRAM NO. 338.

6. TRANSVERSE CONTRACTION JOINTS IN THE PCC SHARED-USE PATH SHALL BE SAWED BY THE SQ FT AND PAID FOR AS PORTLAND CEMENT CONCRETE SIDEWALK, 5".
1. At roadway locations with curb and gutter, the proposed guardrail face shall align with the back of curb.

2. See Hot-Mix Asphalt Mixture Requirements Chart for mixture design.

3. Curb and gutter with reverse pitch gutter shall match the adjacent pavement lane slope.

4. Shared-Use path shall be compliant with the Americans with Disabilities Act (ADA). For shared-use path the maximum running slope is 5%, maximum cross slope is 2%, and maximum ramp slope is 8.33%.

5. Side curb adjacent to PCC shared-use path will be measured in plan view by the sq ft and paid for as Portland cement concrete sidewalk, 5".

6. Transverse contraction joints in the PCC shared-use path shall be sawed not tooled.

NOTES

1. See Hot-Mix Asphalt Mixture Requirements Chart for mixture design.

2. Shared-Use path shall be compliant with the Americans with Disabilities Act (ADA). For shared-use path the maximum running slope is 5%, maximum cross slope is 2%, and maximum ramp slope is 8.33%.

3. Side curb adjacent to PCC shared-use path will be measured in plan view by the sq ft and paid for as Portland cement concrete sidewalk, 5".

4. Transverse contraction joints in the PCC shared-use path shall be sawed not tooled.
PROPOSED TYPICAL SECTION
RAMP B
STA 1120+00 TO STA 1124+80

PROPOSED TYPICAL SECTION
RAMP B
STA 1202+70 TO STA 1205+20

NOTES

1. AT ROADWAY LOCATIONS WITH CURB AND GUTTER, THE PROPOSED GUARDRAIL FACE SHALL ALIGN WITH THE BACK OF CURB.

2. CURB AND GUTTER IN CONFORMITY WITH THE AMERICANS WITH DISABILITIES ACT (ADA). FOR CURB AND GUTTER, THE MAXIMUM RUNNING SLOPE IS 3%, MAXIMUM CROSS SLOPE IS 1%, AND MAXIMUM RAMP SLOPE IS 4.5%.

3. SHARED-USE PATH SHALL BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT (ADA). FOR SHARED-USE PATH, THE MAXIMUM RUNNING SLOPE IS 3%, MAXIMUM CROSS SLOPE IS 1%, AND MAXIMUM RAMP SLOPE IS 4.5%.

4. SIDE CURB ADJACENT TO PCC SHARED-USE PATH WILL BE MEASURED IN PLAN VIEW BY THE SQ FT AND PAID FOR AS PORTLAND CEMENT CONCRETE SIDEWALK, 5".

5. TRANSVERSE CONTRACTION JOINTS IN THE PCC SHARED-USE PATH SHALL BE SAWED NOT TOOLS.
NOTES
1. All roadway locations with curb and gutter, the proposed guardrail face shall align with the back of curb.
2. See Hot-Mix Asphalt Mixtute Requirements Chart for mixture design.
3. Curb and gutter with reverse pitch gutter shall match the adjacent pavement lane slope.
4. Shared-use path shall be compliant with the American with Disabilities Act (ADA) for Shared-use Path. The maximum running slope is 2%, maximum cross slope is 5%, and maximum ramp slope is 8.33%.
5. Side curb adjacent to PCC shared-use path shall be measured in plan view by the sq ft and paid for as Portland cement concrete sidewalk, 5'.
PROPOSED TYPICAL SECTION
W FRONTAGE RD
516 5339+87 TO 516 5348+88

NOTE: NONE OF THE ROADWAY GEOMETRY IS PARALLEL TO CENTERLINE.
NOTES

1. AT ROADWAY LOCATIONS WITH CURB AND GUTTER, THE PROPOSED GUARDRAIL FACE SHALL ALIGN WITH THE BACK OF CURB.

2. SEE HOT-MIX ASPHALT MIXTURE REQUIREMENTS CHART FOR MIXTURE DESIGN.

3. CURB AND GUTTER WITH REVERSE PITCH GUTTER SHALL MATCH THE ADJACENT PAVEMENT LANE SLOPE.

4. SHARED-USE PATH SHALL BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT (ADA). FOR SHARED-USE PATH THE MAXIMUM RUNNING SLOPE IS 5%, MAXIMUM CROSS SLOPE IS 2%, AND MAXIMUM RAMP SLOPE IS 8.33%.

5. SIDE CURB ADJACENT TO PCC SHARED-USE PATH WILL BE MEASURED IN PLAN VIEW CROSS SLOPE IS 2%, AND MAXIMUM RAMP SLOPE IS 8.33%.

6. TRANVERSE CONTRACTION JOINTS IN THE PCC SHARED-USE PATH SHALL BE SAWED BY THE SQ FT AND PAID FOR AS PORTLAND CEMENT CONCRETE SIDEWALK, 5".
**PROJECT AND TRAFFIC INPUTS**

**Route:** IL 59  
**Comments:** Reconstruction of I-55 at IL 59 Interchange  
**Phase II Analysis - Diverging Diamond Configuration**  
**Design Date:** 11/02/2020  
**Design Period (DP):** 20 years  
**Struct. Design ADT = 28,855 (2032)**

### Facility Type
- **Other Marked State Route**
  - # of Lanes = 4
  - **Road Class:** I
  - **Subgrade Support Rating (SSR):** Poor
  - **Construction Year:** 2022
  - **Current ADT:** 25,100
  - **Future ADT:** 31,000

### Traffic Factor Calculation

#### Flexible Pavement
- **Cpv = 0.15**
- **Csu = 132.5**
- **Cmu = 482.53**
- **TF flexible (Actual) = 8.23**
- **TF flexible (Min) = 3.56**

#### Rigid Pavement
- **Cpv = 0.15**
- **Csu = 143.81**
- **Cmu = 696.42**
- **TF rigid (Actual) = 11.62**
- **TF rigid (Min) = 5.02**

### New Construction / Reconstruction Pavement Design Calculations

#### Full-Depth HMA Pavement
- **Use TF flexible = 8.23**  
- **Use TF rigid = 11.62**  
- **HMA Mixture Temp. = 75.5 deg. F**  
- **Design HMA Modulus (E_HMA) = 680 ksi**  
- **Design HMA Strain (e_HMA) = 66**  
- **Full Depth HMA Design Thickness = 12.00 in.**

#### JPC Pavement
- **Use TF flexible = 8.23**  
- **Use TF rigid = 11.62**  
- **Edge Support = Tied Shoulder or C&G**  
- **Rigid Pavt Thick. = 10.00 in.**

### Reconstruction Only (Supplemental) Pavement Design Calculations

#### HMA Pavement Over Rubblized PCC
- **Use TF flexible = 8.23**  
- **Use TF rigid = 11.62**  
- **HMA Overlay Design Thickness = 9.25 in.**

#### Unbonded Concrete Overlay
- **Use TF flexible = 8.23**  
- **Use TF rigid = 11.62**  
- **IBR value = 3**

### Design Tables From BDE Manual Chapter 54 - Pavement Design

<table>
<thead>
<tr>
<th>Class I Roads</th>
<th>Class II Roads</th>
<th>Class III Roads</th>
<th>Class IV Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 lanes or more</td>
<td>2 lanes with ADT &gt; 2000</td>
<td>One way Street with ADT &lt;= 3500</td>
<td>2 Lanes (ADT 750-2000)</td>
</tr>
<tr>
<td>Part of a future 4 lanes or more</td>
<td></td>
<td></td>
<td>(ADT &lt; 750)</td>
</tr>
<tr>
<td>One-way Streets with ADT &gt; 3500</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Traffic Factor ESAL Coefficients

<table>
<thead>
<tr>
<th>Class</th>
<th>Csu</th>
<th>Cmu</th>
<th>Csu</th>
<th>Cmu</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>143.81</td>
<td>696.42</td>
<td>132.50</td>
<td>482.53</td>
</tr>
<tr>
<td>II</td>
<td>135.78</td>
<td>567.21</td>
<td>112.06</td>
<td>385.44</td>
</tr>
<tr>
<td>III</td>
<td>129.58</td>
<td>562.47</td>
<td>109.14</td>
<td>384.35</td>
</tr>
<tr>
<td>IV</td>
<td>129.58</td>
<td>562.47</td>
<td>109.14</td>
<td>384.35</td>
</tr>
</tbody>
</table>

### Traffic Factor Distribution Factors For Structural Design Traffic (Fig. 54-2.B)

<table>
<thead>
<tr>
<th>Number of Lanes</th>
<th>Rural P</th>
<th>Rural S</th>
<th>Rural M</th>
<th>Urban P</th>
<th>Urban S</th>
<th>Urban M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lane Ramp</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>2 or 3</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>4</td>
<td>32%</td>
<td>45%</td>
<td>45%</td>
<td>32%</td>
<td>45%</td>
<td>45%</td>
</tr>
<tr>
<td>6 or more</td>
<td>20%</td>
<td>40%</td>
<td>40%</td>
<td>8%</td>
<td>37%</td>
<td>37%</td>
</tr>
</tbody>
</table>

**Class Table for One-Way Streets**
- **ADT Class:**  
  - 0 - 749: II  
  - 750 - 2000: III  
  - >2000: II  

**Class Table for 2 or 3 Lanes**
- **ADT Class:**  
  - Not future 4 lane & not one-way street  
  - (not future 4 lane & not one-way street)  
  - (not future 4 lane & not one-way street)  

**Note:** Review 54-4.03 for limitations and special considerations.
**Reconstruction of I-55 at IL 59 Interchange**

**Phase II Analysis - Diverging Diamond Configuration**

### Project and Traffic Inputs

- **Route:** I-55
- **Section:** 2018-075-R
- **County:** Will
- **Location:** at IL 59
- **Facility Type:** Interstate or Freeway
- **# of Lanes:** 6 or more
- **Type of Traffic:** Future: 6 lanes or more

### Design Date

- **Design Date:** 11/02/2020
- **ONP:** ONP

### Traffic Data

- **Current ADT:** 73,600 (2018)
- **Future ADT:** 90,300 (2040)

### Traffic Factor Calculation

<table>
<thead>
<tr>
<th>Flexible Pavement</th>
<th>Rigid Pavement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cpv</td>
<td>Cpv</td>
</tr>
<tr>
<td>Csu</td>
<td>Csu</td>
</tr>
<tr>
<td>Cmu</td>
<td>Cmu</td>
</tr>
<tr>
<td>TF flexible (Act)</td>
<td>TF rigid (Act)</td>
</tr>
<tr>
<td>TF flexible (Min)</td>
<td>TF rigid (Min)</td>
</tr>
</tbody>
</table>

### Construction Details

- **Construction Year:** 2022
- **Design Period (DP):** 20 years

### Pavement Design Calculations

- **Use TF flexible = 65.12** (Actual ADT)
- **Use TF rigid = 92.21** (Actual ADT)
- **Use Full-Depth HMA Thickness = 15.00 inches**
- **Use HMA Overlay Thickness = 999.00 inches**

### Design Tables

#### Design Tables from BDE Manual Chapter 54 - Pavement Design

### Traffic Factor ESAL Coefficients

<table>
<thead>
<tr>
<th>Class</th>
<th>Cps</th>
<th>Cmu</th>
<th>Cps</th>
<th>Cmu</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>143.81</td>
<td>696.42</td>
<td>132.50</td>
<td>696.42</td>
</tr>
<tr>
<td>II</td>
<td>135.78</td>
<td>696.42</td>
<td>112.06</td>
<td>696.42</td>
</tr>
<tr>
<td>III</td>
<td>129.58</td>
<td>562.47</td>
<td>109.14</td>
<td>562.47</td>
</tr>
<tr>
<td>IV</td>
<td>129.58</td>
<td>562.47</td>
<td>109.14</td>
<td>562.47</td>
</tr>
</tbody>
</table>

### Design Lane Distribution Factors for Structural Design Traffic

<table>
<thead>
<tr>
<th>Number of Lanes</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lane Ramp</td>
<td>P</td>
<td>S</td>
</tr>
<tr>
<td>2 or 3</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>4</td>
<td>32%</td>
<td>45%</td>
</tr>
<tr>
<td>6 or more</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>LIFE-CYCLE COST</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td>ANNUAL COST PER MILE</td>
<td></td>
</tr>
</tbody>
</table>

**LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY**

**LOWEST COST OPTION**

<table>
<thead>
<tr>
<th>TYPE / PERCENTAGE</th>
<th>HPMA</th>
<th>JPCP</th>
<th>SPC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$153,133</td>
<td>$156,613</td>
<td>$156,681</td>
</tr>
</tbody>
</table>

OTHER OPTIONS (LOWEST TO HIGHEST):

- JPCP $156,613, 2.3%
**PROJECT AND TRAFFIC INPUTS**
(Enter Data in Gray Shaded Cells)

---

**PROJECT AND TRAFFIC INPUTS**

- **Route:** I-55 Ramps
- **Comments:** Reconstruction of I-55 at IL 59 Interchange
- **Phase 2 Analysis - Diverging Diamond Configuration**
- **Design Date:** 11/02/2020
- **ONP:** ← BY

---

**TRAFFIC INPUTS**

- **Current ADT:** 10,700
- **Future ADT:** 11,600
- **Facility Type:** Interstate or Freeway
- **No. of Lanes:** 4
- **Construction Year:** 2022
- **Design Period (DP):** 20 years

---

**TRAFFIC FACTOR CALCULATION**

- **Flexible Pavement:**
  - Cpv = 0.15
  - Csu = 132.5
  - Cmu = 482.53
  - TF flexible (Actual) = 12.10
- **Rigid Pavement:**
  - Cpv = 0.15
  - Csu = 143.81
  - Cmu = 696.42
  - TF rigid (Actual) = 17.03

---

**NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS**

- **Full-Depth HMA Pavement**
  - Use TF flexible = 12.10
  - PG Grade Lower Binder Lifts = PG 64-22
  - Design HMA Mixture Temp. = 75.5 deg. F.
  - Design HMA Mixture Modulus (E50) = 680 ksi
  - Full Depth HMA Design Thickness = 12.75 in.
  - Limiting Strain Criterion Thickness = 15.00 in.
  - Use Full-Depth HMA Thickness = 12.75 inches

- **JPC Pavement**
  - Use TF flexible = 12.10
  - HMA Overlay Design Thickness = 10.00 in.
  - Limiting Strain Criterion Thickness = 9.75 inches
  - Use HMA Overlay Thickness = 9.75 inches

---

**RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS**

- **HMA Pavement Over Rubblized PCC**
  - Use TF flexible = 12.10
  - Review 54-4.03 for limitations and special considerations.

**CONTACT RESEARCH FOR ASSISTANCE**

---

**DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN**

<table>
<thead>
<tr>
<th>Class I Roads</th>
<th>Class II Roads</th>
<th>Class III Roads</th>
<th>Class IV Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 lanes or more</td>
<td>2 lanes with ADT &gt; 2000</td>
<td>Class Table for One-Way Streets</td>
<td>Class Table for 2 or 3 lanes</td>
</tr>
<tr>
<td>Part of a future 4 lanes or more</td>
<td>One way Street with ADT &lt;= 3500</td>
<td>(ADT 750 -2000)</td>
<td>(ADT &lt; 750)</td>
</tr>
<tr>
<td>One-way Streets with ADT &gt; 3500</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Traffic Factor ESAL Coefficients**

<table>
<thead>
<tr>
<th>Traffic Factor ESAL Coefficients</th>
<th>Traffic Factor ESAL Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rigid (Fig. 54-4.C)</strong></td>
<td><strong>Flexible (Fig. 54-5.B)</strong></td>
</tr>
<tr>
<td>Class</td>
<td>Csu</td>
</tr>
<tr>
<td>I</td>
<td>143.81</td>
</tr>
<tr>
<td>II</td>
<td>135.78</td>
</tr>
<tr>
<td>III</td>
<td>129.58</td>
</tr>
<tr>
<td>IV</td>
<td>129.58</td>
</tr>
</tbody>
</table>

**Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)**

<table>
<thead>
<tr>
<th>Number of Lanes</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lane Ramp</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>2 or 3</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>4</td>
<td>32%</td>
<td>45%</td>
</tr>
<tr>
<td>6 or more</td>
<td>20%</td>
<td>40%</td>
</tr>
</tbody>
</table>
**PROJECT AND TRAFFIC INPUTS**

**Route:** Seil Road/West Frontage Road  
**Comments:** Reconstruction of I-55 at IL 59 Interchange  
**Section:** 2018-075-R  
**County:** Will  
**Location:** at IL 59/I-55  
**Design Date:** 11/02/2020  
**ADT Year:** 2018  
**Current ADT:** 10,900  
**Future ADT:** 23,000

**Traffic Factor Calculation**

**Flexible Pavement**
- $C_{pv} = 0.15$  
- $C_{su} = 112.06$  
- $C_{mu} = 385.44$

**Rigid Pavement**
- $C_{pv} = 0.15$  
- $C_{su} = 135.78$  
- $C_{mu} = 567.21$

**Traffic Factor**
- TF flexible (Actual) = 3.57  
- TF flexible (Min) = No Min

**New Construction / Reconstruction Pavement Design Calculations**

**Flexible Pavement**
- Full-Depth HMA Pavement
  - Use TF flexible = 3.57
  - Use TF rigid = 5.15
- CRC Pavement
  - Use TF flexible = 3.57
  - Use TF rigid = 5.15

**Rigid Pavement**
- JPC Pavement
  - Use TF rigid = 5.15
- Unbonded Concrete Overlay
  - Use TF rigid = 5.15

**Design Tables from BDE Manual Chapter 54 - Pavement Design**

- Class I Roads
  - 4 lanes or more
  - Part of a future 4 lanes or more
  - One-way Streets with ADT > 3500
  - Class I Roads
  - 2 lanes with ADT > 2000
  - One way Street with ADT <= 3500

- Class II Roads
  - 2 Lanes
  - (ADT 750 -2000)

- Class III Roads
  - 2 Lanes
  - (ADT < 750)

- Class IV Roads
  - 2 or 3 lanes
  - 4 lanes or more
  - (not future 4 lane & not one-way street)

**Class Table for One-Way Streets**

- Facility Type
  - Interstate or Freeway
  - Other Marked State Route
  - Unmarked State Route

- Traffic Factor ESAL Coefficients

- Class Table for 2 or 3 lanes

- Design Lane Distribution Factors For Structural Design Traffic
### LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

**FULL-DEPTH HMA PAVEMENT**

**ROUTE** E. Frontage Road/Center Drive  
**SECTION** 2018-075-R  
**COUNTY** Will  
**LOCATION** at IL 59/I-55

**FACILITY TYPE** NON-INTERSTATE

<table>
<thead>
<tr>
<th>PROJECT LENGTH</th>
<th>4030 FT</th>
<th>0.76 Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td># OF CENTERLINES</td>
<td>2 CL</td>
<td></td>
</tr>
<tr>
<td># OF LANES</td>
<td>3 LANES</td>
<td></td>
</tr>
<tr>
<td># OF EDGES</td>
<td>2 EP</td>
<td></td>
</tr>
<tr>
<td>LANE WIDTH - AVERAGE</td>
<td>12 FT</td>
<td></td>
</tr>
<tr>
<td>SHOULDER WIDTH</td>
<td>HMA Left</td>
<td>0 FT</td>
</tr>
<tr>
<td></td>
<td>HMA Right</td>
<td>0 FT</td>
</tr>
<tr>
<td></td>
<td>Total Width of Paved Shoulders</td>
<td>0 FT</td>
</tr>
</tbody>
</table>

**PAVEMENT THICKNESS (FLEXIBLE)**  
SHOULDERS: 9.00 IN  
PAVEMENT: 15.00 IN MAX

**FLEX PAVEMENT TRAFFIC FACTORS**  
**HMA COST PER TON**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>THICKNESS</th>
<th>100% QUA UNIT</th>
<th>UNIT PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA SURFACE COURSE</td>
<td>(2.00&quot;)</td>
<td>1.0046</td>
<td>$98.53 / TON</td>
</tr>
<tr>
<td>HMA TOP BINDER COURSE</td>
<td>(2.25&quot;)</td>
<td>1.0145</td>
<td>$82.62 / TON</td>
</tr>
<tr>
<td>HMA LOWER BINDER COURSE</td>
<td>(4.75&quot;)</td>
<td>1.0307</td>
<td>$82.62 / TON</td>
</tr>
<tr>
<td>HMA SHOULDER</td>
<td>(8.00&quot;)</td>
<td>0</td>
<td>$72.00 / TON</td>
</tr>
<tr>
<td>CURB &amp; GUTTER</td>
<td>8,060 LIN FT</td>
<td>$30.00 / LIN FT</td>
<td></td>
</tr>
</tbody>
</table>

**IMPROVED SUBGRADE:**  
Width = 38.5’  
Reserved For User Supplied Item  
Reserved For User Supplied Item

**PAVEMENT REMOVAL**  
16,120 SQ YD  
Reserved For User Supplied Item  
Reserved For User Supplied Item

**SHOULDER REMOVAL**  
16,120 SQ YD  
Reserved For User Supplied Item  
Reserved For User Supplied Item

**MAINTENANCE COSTS:**  
**HMA OVERLAY PVMT SURF** (Year 30)  
Shoulder I 2.00 $80.14 / SQ YD

**MILLING** (2.00 IN)  
2.00 $3.00 / SQ YD

**PARTIAL DEPTH PVMT PATCH** (Mill & Fill Surf)  
Surface N 2.00 $81.04 / SQ YD

**PARTIAL DEPTH SHLD PATCH** (Mill & Fill +2.00")  
Shoulder I 2.00 $78.06 / SQ YD

**RESERVED FOR USER SUPPLIED ITEM**

**FLEXIBLE CONSTRUCTION INITIAL COST**  
$1,311,560

**FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE**  
$70,084

**MAINTENANCE COSTS:**  
**HMA OVERLAY PVMT SURF** (Year 30)  
Shoulder I 2.00 $80.14 / SQ YD

**MILLING** (2.00 IN)  
2.00 $3.00 / SQ YD

**PARTIAL DEPTH PVMT PATCH** (Mill & Fill Surf)  
Surface N 2.00 $81.04 / SQ YD

**PARTIAL DEPTH SHLD PATCH** (Mill & Fill +2.00")  
Shoulder I 2.00 $78.06 / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL $2.00 / LIN FT
CENTERLINE JOINT ROUT & SEAL $2.00 / LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL (100% Reh) $2.00 / LIN FT

FLEXIBLE TOTAL LIFE- $1,732,383
FLEXIBLE TOTAL ANNUAL COST PER MILE $92,571
**PCC PAVEMENT**

**ROUTE**
E. Frontage Road/Center Drive

**SECTION**
2018-075-R

**COUNTY**
Will

**LOCATION**
at IL 59/I-55

**FACILITY TYPE**
NON-INTERSTATE

**PROJECT LENGTH**
4030 FT = = > 0.76 Miles

**# OF CENTERLINES**
2 CL

**# OF LAnES**
3 LANES

**# OF EDGES**
2 EP

**LANE WIDTH - AVERAGE**
PCC 12 FT

**SHOULDER WIDTH**
PCC Left 0 FT
PCC Right 0 FT

**Total Width of Paved Shoulders**
0 FT

**PAVEMENT THICKNESS (RIGID)**
JPCP 8.50 IN TIED SHLD

**SHOULDER THICKNESS**
8.50 IN

**HMA OVERLAY THICKNESS**
2.75 IN

**RIGID PAVEMENT TRAFFIC FACTORS**

<table>
<thead>
<tr>
<th>Worksheet Construction Type is</th>
<th>Minimum</th>
<th>Actual</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconstruction</td>
<td>No Min</td>
<td>2.40</td>
<td>2.40</td>
</tr>
</tbody>
</table>

**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>( 8.50&quot;)</td>
<td>16,120 SQ YD</td>
<td>$66.99</td>
<td>$1,063,759</td>
</tr>
<tr>
<td>PAVEMENT REINFORCEMENT</td>
<td>0 SQ YD</td>
<td>$22.00</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>STABILIZED SUBBASE</td>
<td>( 4.00&quot;)</td>
<td>0 SQ YD *</td>
<td>$19.00</td>
<td>$0</td>
</tr>
<tr>
<td>PCC SHOULDERS</td>
<td>( 8.50&quot; to 8.50&quot;)</td>
<td>0 SQ YD</td>
<td>$40.00</td>
<td>$0</td>
</tr>
<tr>
<td>CURB &amp; GUTTER</td>
<td>8,060 LIN FT *</td>
<td>$30.00 / LIN FT</td>
<td>$241,800</td>
<td></td>
</tr>
<tr>
<td>SUBBASE GRAN MATL TY C</td>
<td>( ~ 0.00&quot;)</td>
<td>0 TONS</td>
<td>$25.00 / TON</td>
<td>$0</td>
</tr>
<tr>
<td>IMPROVED SUBGRADE: Aggregate</td>
<td>Width = 37.0'</td>
<td>16,568 SQ YD</td>
<td>$7.00 / SQ YD</td>
<td>$115,976</td>
</tr>
</tbody>
</table>

**Reserved For User Supplied Item**

| Reserved For User Supplied Item | 0 UNITS | $0.00 / UNITS | $0         |
| Reserved For User Supplied Item | 0 UNITS | $0.00 / UNITS | $0         |

| PAVEMENT REMOVAL              | 16,120 SQ YD | $15.00 / SQ YD | $241,800 |

**SHOULDER REMOVAL**

| 0 SQ YD | $0.00 / SQ YD | $0         |

**Note:** * Denotes User Supplied Quantity

**MAINTENANCE COSTS:**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>THICKNESS</th>
<th>MATERIAL T</th>
<th>UNIT COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROUTINE MAINTENANCE ACTIVITY</td>
<td></td>
<td></td>
<td>$0.00 / LANE-MILE / YEAR</td>
</tr>
</tbody>
</table>

| HMA OVERLAY                   | ( 2.75") | 2.75       | $195.00 / SQ YD |
| HMA OVERLAY PAVEMENT          | ( 2.75") | 1.0064     | $14.71 / SQ YD  |
| HMA SURFACE MIX               | (1.50")  | 1.0035     | $8.31 / SQ YD   |
| HMA SURFACE MIX               | 1.50      | Surface N  | $78.28 / SQ YD  |
| HMA BINDER MIX                | (1.25")  | 1.0098     | $6.40 / SQ YD   |

| HMA OVERLAY SHOULDER          | (2.75")  | 2.75       | $11.09 / SQ YD  |
| CLASS A PAVEMENT PATCHING     |           |            | $195.00 / SQ YD |
| CLASS B PAVEMENT PATCHING     |           |            | $150.00 / SQ YD |
| CLASS C SHOULDER PATCHING     |           |            | $145.00 / SQ YD |

| PARTIAL DEPTH PVMT PATCH      | Surface N | 1.50       | $78.28 / SQ YD  |
| PARTIAL DEPTH PVMT PATCH      | Surface N | 2.75       | $85.17 / SQ YD  |

**LONGITUDINAL SHOULDER JOINT ROUT & SEAL**

| CENTERLINE JOINT ROUT & SEAL | $2.00 / LIN FT |
| REFLECTIVE TRANSVERSE CRACK ROUT & SEAL | $2.00 / LIN FT |
| RANDOM CRACK ROUT & SEAL      | (100% Rehab = 100.00' / 100.00") | $2.00 / LIN FT |

**RIGID TOTAL LIFE-C**
$1,926,988

**RIGID TOTAL ANNUAL**
$102,970
### LIFE-CYCLE COST ANALYSIS: NEW DESIGN

<table>
<thead>
<tr>
<th></th>
<th>JPCP</th>
<th>HMA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSTRUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INITIAL COST</td>
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</tr>
<tr>
<td>PRESENT</td>
<td>$1,663,335</td>
<td>$1,311,560</td>
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<tr>
<td>ANNUAL CI</td>
<td>$88,881</td>
<td>$70,084</td>
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<tr>
<td><strong>MAINTENANCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIFE-CYCLE COST</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRESENT</td>
<td>$263,653</td>
<td>$420,823</td>
</tr>
<tr>
<td>ANNUAL CI</td>
<td>$14,088</td>
<td>$22,487</td>
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<tr>
<td><strong>TOTAL</strong></td>
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<td></td>
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<tr>
<td>LIFE-CYCLE COST</td>
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<td></td>
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<tr>
<td>PRESENT</td>
<td>$1,926,988</td>
<td>$1,732,383</td>
</tr>
<tr>
<td>ANNUAL CI</td>
<td>$102,970</td>
<td>$92,571</td>
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</tbody>
</table>

### LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

**LOWEST COST OPTION**

<table>
<thead>
<tr>
<th>TYPE / PE</th>
<th>JPCP</th>
<th>HMA</th>
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<tbody>
<tr>
<td></td>
<td>$102,970</td>
<td>$92,571</td>
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</table>

**OTHER OPTIONS (LOWEST TO HIGHEST):**

<table>
<thead>
<tr>
<th>TYPE / PE</th>
<th>COST</th>
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<tbody>
<tr>
<td>JPCP</td>
<td>$102,970</td>
</tr>
<tr>
<td></td>
<td>11.2%</td>
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## MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

01/12/21

### FULL-DEPTH HMA PAVEMENT

HMA PAVEMENT OVER RUBBLED PCC PAVEMENT

Figure 54-7.C

STANDARD DESIGN

### MAINTENANCE COSTS:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>%</th>
<th>ITEM</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>COST</th>
<th>PRESENT WORTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td>LONG SHLD JT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNTR LINE JOINT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RNDM / THRM CRACK R&amp;S</td>
<td>50.00%</td>
<td>6,650</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$13,300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PD PVMT PATCH M&amp;F SURF</td>
<td>0.10%</td>
<td>16</td>
<td>SQ YD</td>
<td>$81.04</td>
<td>$1,297</td>
</tr>
<tr>
<td></td>
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<td>PWFn</td>
<td>0.8626</td>
<td>PW</td>
<td>0.8626 X</td>
<td>$46,837</td>
<td>$40,402</td>
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<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNTR LINE JOINT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RNDM / THRM CRACK R&amp;S</td>
<td>50.00%</td>
<td>6,650</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$13,300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PD PVMT PATCH M&amp;F SURF</td>
<td>0.50%</td>
<td>81</td>
<td>SQ YD</td>
<td>$81.04</td>
<td>$6,564</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PWFn</td>
<td>0.7441</td>
<td>PW</td>
<td>0.7441 X</td>
<td>$52,104</td>
<td>$38,770</td>
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<tr>
<td>15</td>
<td></td>
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<td>100.00%</td>
<td>16,120</td>
<td>SQ YD</td>
<td>$3.00</td>
<td>$48,360</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PD PVMT PATCH M&amp;F ADD'L 2.00&quot;</td>
<td>1.00%</td>
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<td>SQ YD</td>
<td>$80.14</td>
<td>$12,903</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HMA OVERLAY PVMT 2.00&quot;</td>
<td>100.00%</td>
<td>16,120</td>
<td>SQ YD</td>
<td>$11.09</td>
<td>$178,714</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HMA OVERLAY SHLD 2.00&quot;</td>
<td>100.00%</td>
<td>0</td>
<td>SQ YD</td>
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<td>$0</td>
</tr>
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<td></td>
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<td>0.6419 X</td>
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<td>LIN FT</td>
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<td>$16,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNTR LINE JOINT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RNDM / THRM CRACK R&amp;S</td>
<td>50.00%</td>
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<td>LIN FT</td>
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<td>$13,300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PD PVMT PATCH M&amp;F SURF</td>
<td>0.10%</td>
<td>16</td>
<td>SQ YD</td>
<td>$81.04</td>
<td>$1,297</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PWFn</td>
<td>0.5537</td>
<td>PW</td>
<td>0.5537 X</td>
<td>$46,837</td>
<td>$25,933</td>
</tr>
<tr>
<td>25</td>
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<td>SQ YD</td>
<td>$3.00</td>
<td>$48,360</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PD PVMT PATCH M&amp;F ADD'L 2.00&quot;</td>
<td>2.00%</td>
<td>322</td>
<td>SQ YD</td>
<td>$80.14</td>
<td>$25,806</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HMA OVERLAY PVMT 2.00&quot;</td>
<td>100.00%</td>
<td>16,120</td>
<td>SQ YD</td>
<td>$11.09</td>
<td>$178,714</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HMA OVERLAY SHLD 2.00&quot;</td>
<td>100.00%</td>
<td>0</td>
<td>SQ YD</td>
<td>$8.06</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PWFn</td>
<td>0.4776</td>
<td>PW</td>
<td>0.4776 X</td>
<td>$52,104</td>
<td>$24,885</td>
</tr>
<tr>
<td>30</td>
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<td>SQ YD</td>
<td>$3.00</td>
<td>$48,360</td>
</tr>
<tr>
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<td></td>
<td>PD PVMT PATCH M&amp;F ADD'L 2.00&quot;</td>
<td>2.00%</td>
<td>322</td>
<td>SQ YD</td>
<td>$80.14</td>
<td>$25,806</td>
</tr>
<tr>
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<td></td>
<td>HMA OVERLAY PVMT 2.00&quot;</td>
<td>100.00%</td>
<td>16,120</td>
<td>SQ YD</td>
<td>$11.09</td>
<td>$178,714</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HMA OVERLAY SHLD 2.00&quot;</td>
<td>100.00%</td>
<td>0</td>
<td>SQ YD</td>
<td>$8.06</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>PW</td>
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<td>$16,120</td>
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<tr>
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<td>$16,120</td>
</tr>
<tr>
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<td>RNDM / THRM CRACK R&amp;S</td>
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<td>LIN FT</td>
<td>$2.00</td>
<td>$13,300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PD PVMT PATCH M&amp;F SURF</td>
<td>0.10%</td>
<td>16</td>
<td>SQ YD</td>
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<td>$1,297</td>
</tr>
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<td>$16,645</td>
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<tr>
<td>40</td>
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<td>LONG SHLD JT R&amp;S</td>
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<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNTR LINE JOINT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RNDM / THRM CRACK R&amp;S</td>
<td>50.00%</td>
<td>6,650</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$13,300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PD PVMT PATCH M&amp;F SURF</td>
<td>0.50%</td>
<td>81</td>
<td>SQ YD</td>
<td>$81.04</td>
<td>$6,564</td>
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</tbody>
</table>

## ROUTINE MAINTENANCE ACTIVITY

2.29 Lane Miles

<table>
<thead>
<tr>
<th>YEAR</th>
<th>LIFE CYCLE</th>
<th>CRFn</th>
<th>MAINTENANCE</th>
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<tr>
<td>45</td>
<td>0.0407852</td>
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</table>

MAINTENANCE ANNUAL COST PER MILE $22,487
## Jointed Plain Concrete Pavement

**Unbonded Jointed Plain Concrete Overlay**

Figure 54-7A

### Maintenance and Rehabilitation Activity Schedule

01/12/21

<table>
<thead>
<tr>
<th>MAINTENANCE ITEM</th>
<th>%</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT COST</th>
<th>COST</th>
<th>PRESENT WORTH</th>
</tr>
</thead>
<tbody>
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<td><strong>YEAR 10</strong></td>
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<td></td>
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</tr>
<tr>
<td>PAVEMENT PATCH</td>
<td>0.10%</td>
<td>16</td>
<td>SQ YD</td>
<td>$150.00</td>
<td>$2,400</td>
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</tr>
<tr>
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<tr>
<td><strong>YEAR 15</strong></td>
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</tr>
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<td>PW =</td>
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<td>$3,081</td>
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<tr>
<td><strong>YEAR 20</strong></td>
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</tr>
<tr>
<td>PAVEMENT PATCH</td>
<td>2.00%</td>
<td>322</td>
<td>SQ YD</td>
<td>$150.00</td>
<td>$48,300</td>
<td></td>
</tr>
<tr>
<td>SHOULDER PATCH</td>
<td>0.50%</td>
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<td>SQ YD</td>
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<td>$0</td>
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</tr>
<tr>
<td>LONGITUDINAL SHLD JT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
<td></td>
</tr>
<tr>
<td>CENTERLINE JT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PWFn =</td>
<td>0.5537</td>
<td>PW =</td>
<td>0.5537 X</td>
<td>$80,540</td>
<td>$44,593</td>
</tr>
<tr>
<td><strong>YEAR 25</strong></td>
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</tr>
<tr>
<td>PAVEMENT PATCH</td>
<td>3.00%</td>
<td>484</td>
<td>SQ YD</td>
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<td>$72,600</td>
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</tr>
<tr>
<td>SHOULDER PATCH</td>
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<td>SQ YD</td>
<td>$145.00</td>
<td>$0</td>
<td></td>
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<tr>
<td></td>
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<td>0.4776 X</td>
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<td><strong>YEAR 30</strong></td>
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<td>PAVEMENT PATCH</td>
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<td>SQ YD</td>
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<td>$0</td>
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</tr>
<tr>
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<td>LIN FT</td>
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<td>$237,085</td>
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<td>SQ YD</td>
<td>$11.09</td>
<td>$0</td>
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</tr>
<tr>
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<td>PWFn =</td>
<td>0.4120</td>
<td>PW =</td>
<td>0.4120 X</td>
<td>$333,835</td>
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<td><strong>YEAR 35</strong></td>
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<td>LONGITUDINAL SHLD JT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
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<tr>
<td>CENTERLINE JT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
<td></td>
</tr>
<tr>
<td>RANDOM CRACK R&amp;S</td>
<td>50.00%</td>
<td>6,045</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$12,090</td>
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<tr>
<td>REFLECTIVE TRANSVERSE CRACK R&amp;S</td>
<td>40.00%</td>
<td>3,874</td>
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<td>PD PVMT PATCH M&amp;F HMA 2.75&quot;</td>
<td>0.10%</td>
<td>16</td>
<td>SQ YD</td>
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<td>$1,363</td>
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<tr>
<td></td>
<td>PWFn =</td>
<td>0.3554</td>
<td>PW =</td>
<td>0.3554 X</td>
<td>$53,441</td>
<td>$18,992</td>
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<td><strong>YEAR 40</strong></td>
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<tr>
<td>PAVEMENT PATCH</td>
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<td>81</td>
<td>SQ YD</td>
<td>$150.00</td>
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<td>LONGITUDINAL SHLD JT R&amp;S</td>
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<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
<td></td>
</tr>
<tr>
<td>CENTERLINE JT R&amp;S</td>
<td>100.00%</td>
<td>8,060</td>
<td>LIN FT</td>
<td>$2.00</td>
<td>$16,120</td>
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<tr>
<td>REFLECTIVE TRANSVERSE CRACK R&amp;S</td>
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<td>5,810</td>
<td>LIN FT</td>
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<td>$11,620</td>
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<tr>
<td>RANDOM CRACK R&amp;S</td>
<td>50.00%</td>
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<td>LIN FT</td>
<td>$2.00</td>
<td>$12,090</td>
<td></td>
</tr>
<tr>
<td>PD PVMT PATCH M&amp;F HMA 2.75&quot;</td>
<td>0.50%</td>
<td>81</td>
<td>SQ YD</td>
<td>$85.17</td>
<td>$6,899</td>
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<tr>
<td></td>
<td>PWFn =</td>
<td>0.3066</td>
<td>PW =</td>
<td>0.3066 X</td>
<td>$74,999</td>
<td>$22,991</td>
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### Routine Maintenance Activity

- **2.29** Lane Miles
  - **$0.00** MAINTENANCE
  - **$263,653** MAINTENANCE

### Year Life Cycle

- **CRFn = 0.0407852**
  - **$263,653** MAINTENANCE
  - **$14,088** MAINTENANCE
**PROJECT AND TRAFFIC INPUTS**

**ROUTE AND TRAFFIC INPUTS**

**Enter Data in Gray Shaded Cells**

- **Route:** E. Frontage Road/Center Drive
- **Comments:** Reconstruction of I-55 at IL 59 Interchange
- **Section:** 2018-075-R
- **County:** Will
- **Location:** at IL 59/I-55
- **Section:** 2018-075-R
- **County:** Will
- **Location:** at IL 59/I-55
- **Design Date:** 11/02/2020
- **Modify Date:** 11/02/2020
- **ADT Current Year:** 2018
- **ADT Future Year:** 2040
- **Traffic Factor Calculation**
  - Flexible Pavement
    - Cpv = 0.15
    - Csu = 112.06
    - Cmu = 385.44
  - Rigid Pavement
    - Cpv = 0.15
    - Csu = 135.78
    - Cmu = 567.21
  - TF Flexible (Actual) = 1.66 (Actual ADT)
  - TF Rigid (Actual) = 2.40 (Actual ADT)
  - TF Flexible (Min) = No Min (Min ADT Fig. 54-2.C)
  - TF Rigid (Min) = No Min (Min ADT Fig. 54-2.C)

**NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS**

- **Flexible Pavement**
  - Use TF flexible = 1.66
  - PG Grade Lower Binder Lifts = 680 ksi (Fig. 54-5.D)
  - Design HMA Mixture Thickness = 104 in. (Fig. 54-5.F)
  - Limiting Strain Criterion Thickness = 15.00 in. (Fig. 54-5.J)
  - Use Full-Depth HMA Thickness = 9.00 inches

- **Rigid Pavement**
  - Use TF rigid = 2.40
  - Edge Support = Tied Shoulder or C&G
  - Use CRC Pavement
  - Use CRC Pavement
  - Use CRC Pavement
  - Use HMA Overlay Thickness = 6.00 inches

**RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS**

- **Flexible Pavement**
  - Use TF flexible = 1.66
  - PG Grade Lower Binder Lifts = 680 ksi (Fig. 54-5.D)
  - Design HMA Mixture Thickness = 104 in. (Fig. 54-5.F)
  - Limiting Strain Criterion Thickness = 15.00 in. (Fig. 54-5.J)
  - Use Full-Depth HMA Thickness = 9.00 inches

**DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN**

- **Traffic Factor ESAL Coefficients**
  - Class I
  - Class II
  - Class III
  - Class IV

- **Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.8)**
  - Rural
  - Urban

**CONTACT RESEARCH FOR ASSISTANCE**

- **Class I Roads**
  - 4 lanes or more
  - Part of a future 4 lanes or more
  - One-way Streets with ADT > 3500

- **Class II Roads**
  - 2 lanes with ADT > 2000
  - One way Street with ADT <= 3500
  - (ADT 750-2000)

- **Class III Roads**
  - 2 Lanes
  - (ADT < 750)

- **Class IV Roads**
  - 2 Lanes
  - (not future 4 lane & not one way street)

- **Class Table for One-Way Streets**
  - ADT
  - Class

- **Class Table for 2 or 3 lanes**
  - ADT
  - Class

- **Number of Lanes**
  - 1 Lane Ramp: 100%
  - 2 or 3: 50%
  - 4: 32%
LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

RECONSTRUCTION - HMA OVER RUBBLIZED PAVEMENT

<table>
<thead>
<tr>
<th>ITEM</th>
<th>FACILITY TYPE</th>
<th>PROJECT LENGTH</th>
<th># OF Lanes</th>
<th>SHOULDER WIDTH HMA Left</th>
<th>HMA BINDER COURSE (1.50&quot;)</th>
<th>HMA SURFACE MIX (2.00&quot;)</th>
<th>HMA OVERLAY THICKNESS</th>
<th>RIGID CONSTRUCTION INITIAL COST</th>
<th>MAINTENANCE LIFE-CYCLE COST</th>
<th>RIGID TOTAL LIFE-CYCLE COST</th>
<th>RIGID TOTAL ANNUAL COST PER MILE</th>
<th>RIGID CONSTRUCTION ANNUAL COST PER MILE</th>
<th>RIGID CONSTRUCTION ANNUAL COST PER SCHOOL YEAR</th>
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</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE $70,084 RNDM / THRM CRACK R&S 50.00% 6,650 LIN FT $2.00 $13,300

Note: * Denotes User Supplied Quantity

---

**FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE**

- **$70,084**

**RNDM / THRM CRACK R&S 50.00%**
- **6,650 LIN FT**
- **$2.00**
- **$13,300**

**Note:** Denotes User Supplied Quantity

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**RNDM / THRM CRACK R&S 50.00%**
- **6,650 LIN FT**
- **$2.00**
- **$13,300**

**Note:** Denotes User Supplied Quantity
## LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

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<thead>
<tr>
<th>Option</th>
<th>Type</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>HMA</td>
<td>JPCP</td>
<td>11.2%</td>
</tr>
<tr>
<td>JPCP</td>
<td>HMA</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Total**
- **Life-Cycle Cost Present Worth**: $1,926,988
- **Annual Cost Per Mile**: $92,571

**LCA**
- **Lowest Cost Option**
  - **HMA**
  - **JPCP**

**Other Options (Lowest to Highest):**
- **JPCP**
  - **HMA**
  - **Total**