# Illinois Department of Transportation

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|---|---|---|
| To: | John Fortmann | Attn: District One |
| From: | John D. Baranzelli | |
| Subject: | Pavement Design | |
| Date: | July 7, 2014 | |

Barrington Road
Cook County
At I-90

The project, submitted to BDE by email memo dated April 15, 2014, will improve the interchange by widening and resurfacing IL 72. I-72 will utilize a flexible design based on first cost. Barrington Road will be widened, and a portion of Barrington Road will be reconstructed to accommodate a new interchange. Barrington Road will be built as a rigid pavement, based on lowest first cost. The approved pavement design is as follows:

IL 72 (Pavement Widening & Resurfacing)

11 inches of Full Depth HMA Pavement with PCC Curb & Gutter
- 1.75 inches of Polymerized HMA Surface Course, SMA N80, IL-9.5
- 0.75 inches of Polymerized Leveling Binder (Machine Method), IL-4.75, N50
- 8.5 inches of HMA Binder Course, IL-19.0, N70

12 inches of Aggregate Subgrade Improvement

Barrington Road (North of Hassell Road to Central Road) (Reconstruction)

9.75 inches of PCC Jointed Pavement with tied PCC Curb & Gutter
12 inches of Aggregate Subgrade Improvement

Barrington Road (IL 72 to North of Hassell Road) (Widening)

10.25 inches of PCC Jointed Pavement with tied PCC Curb & Gutter
12 inches of Aggregate Subgrade Improvement

Pavement Resurfacing

Cold Milling of Existing HMA Pavement
2.5 inches minimum (more if Necessary)
- 1.75 inches of Polymerized HMA Surface Course, SMA N80, IL-9.5
- 0.75 inches of Polymerized Leveling Binder (Machine Method), IL-4.75, N50

Temporary Pavement – Barrington Road

Option 1

12 inches of Full Depth Temporary HMA Pavement
2 inches of HMA Surface Course, Mix "D", N50
10 inches of HMA Binder Course, IL-19.0, N50
4 inches of Subbase Granular Material, Type B (CA-6)

Option 2

10 inches of Temporary PCC Pavement
4 inches of Subbase Granular Material, Type B (CA-6)

If you have any questions, please contact Paul Niedernhofer at (217) 524-1651.

# Illinois Department of Transportation

## Memorandum

To: John D. Baranzelli  Attn: Paul Niedernhofer

From: Jose A. Dominguez  By: Melchor Mangoba / Ojas Patel

Subject: Pavement Analysis*

Date: April 15, 2014

*Route: Barrington Road
Limits: at I-90
Section: Unknown
Current target: Unknown

County: Cook
Contract No.: 13560
Job No.: P-91-589-11

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:

***IL 72 – Widening & Resurfacing to provide an additional through lane.***

***Barrington Rd – Reconstruction (north of Hassell Road to Central Road) accommodating new interchange. Widening (IL 72 to north of Hassell Road) to provide an additional through lane.***

A 20-year pavement analysis was performed on the above segments. Our recommendation for IL 72 is based on the mechanistic pavement design procedure using a first cost analysis. Our recommendation for the reconstruction segment of Barrington Road is the mechanistic-rigid pavement design based on the life cycle cost analysis which favors PCC pavement by 14%. A segmental pavement analysis was performed on the widening segment of Barrington Road and it is recommended to match-in-kind to existing pavement and use a rigid pavement design.

IL 72 at Barrington Road is considered a "High Stress" intersection since the design lane MU ADT exceeds 200 vehicles. District 1 recommends rigid pavement or SMA N80 (IL-9.5) at "High Stress" intersections to be built at a minimum 150 feet back from the location of the stop bar.

Our recommendation is as follows:

**IL 72 (Higgins Road)**

Widening & Resurfacing
PCC Curb and Gutter
11" Full Depth HMA[7]
1 ¾" Polymerized HMA Surface Course, SMA, N80 (IL-9.5)[1]
¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50[2]
8 ½" HMA Binder Course, IL-19.0, N70[3]
12" Aggregate Subgrade Improvement[6]

**Barrington Road (North of Hassell Road to Central Road)**

Reconstruction
PCC Curb and Gutter (Tied)
9 ¾" PCC Pavement[4]
12" Aggregate Subgrade Improvement[6]

**Barrington Road (IL 72 to North of Hassell Road)**

Widening
PCC Curb and Gutter (Tied)
10 ¼" PCC Pavement[5]
12" Aggregate Subgrade Improvement[6]

**Pavement Resurfacing**

Cold Milling of HMA Pavement
2 ½" minimum (more if necessary)
1 ¾" Polymerized HMA Surface Course, SMA, N80 (IL-9.5)[1]
¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50[2]

**Temporary Pavement – Barrington Road**

Option 1[8]
12" Full Depth Temporary HMA Pavement[9]
2" HMA Surface Course, Mix "D", N50
8" HMA Binder Course, IL-19.0, N50
4" Subbase Granular Material Type B (CA-6)

Option 2[8]
10" Temporary PCC Pavement[9]
4" Subbase Granular Material Type B (CA-6)

[1]Designer Note 1: Use pay item **40603153, POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, SMA, N80 (IL-9.5)** paid for in tons.

[2]Designer Note 2: Use pay item **40600827, POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75, N50** paid for in tons.

[3]Designer Note 3: For widening of six feet or less use pay item **#1009583, Hot-Mix Asphalt Base Course Widening, 8 ½"**, paid for in square yards. For widening of greater than six feet use pay item **35501318, Hot-Mix Asphalt Base Course, 8 ½"**, paid for in square yards.

[4]Designer Note 4: Use pay item **42000416, PORTLAND CEMENT CONCRETE PAVEMENT 9 ¾" (JOINTED),** paid for in square yards.

[5]Designer Note 5: Use pay item **42000506, PORTLAND CEMENT CONCRETE PAVEMENT 10 ¼" (JOINTED),** paid for in square yards. Joints in pavement widening shall match existing joints in existing pavement.

[6]Designer Note 6: Use pay item **#30300112, "AGGREGATE SUBGRADE IMPROVEMENT, 12"**, paid in square yards.

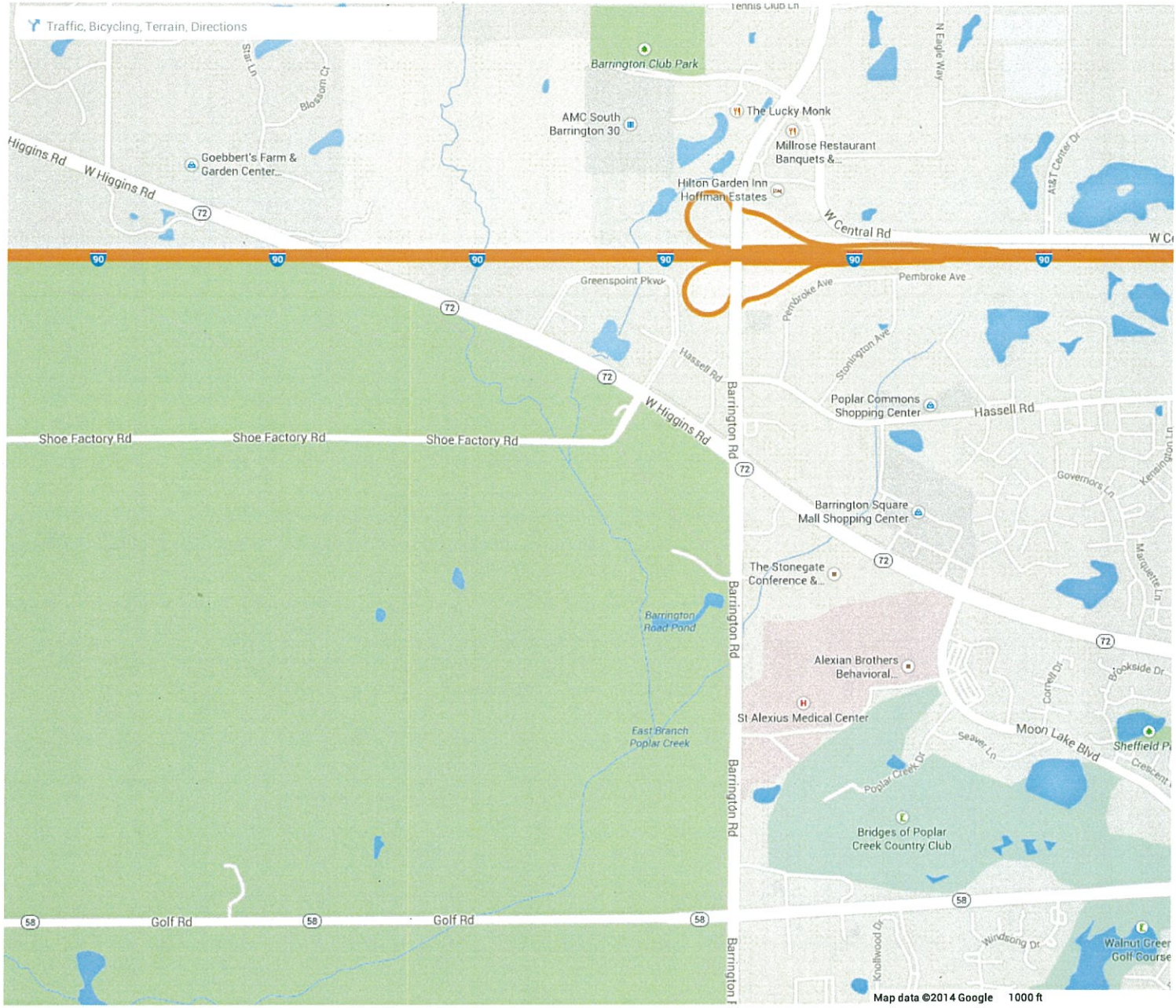
[7]Designer Note 7: Refer to the District One, Bureau of Materials' "Hot-Mix Asphalt – Mix Selection" tables to determine the corresponding HMA mix table requirements for the plans.

[8]Designer Note 8: The contractor shall have the option of constructing either material type if both Portland cement concrete and HMA are shown in the plans. For quantity estimation purposes, excavation quantities should be estimated assuming the thicker design if both options are shown in the plans.

[9]Designer Note 9: Use pay item **#Z0062456, "TEMPORARY PAVEMENT"**, paid in square yards.

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

By: José A. Dominguez
Jose A. Dominguez, P.E.
Project Support Engineer


Traffic, Bicycling, Terrain, Directions
Barrington Club Park
AMC South Barrington 30
The Lucky Monk
Millrose Restaurant Banquets &...
Goebbert's Farm & Garden Center...
Hilton Garden Inn Hoffman Estates
Higgins Rd
W Higgins Rd
W Central Rd
Greenspoint Pkwy
Pembroke Ave
Hassell Rd
Stonington Ave
Poplar Commons Shopping Center
Barrington Square Mall Shopping Center
The Stonegate Conference &...
Shoe Factory Rd
Barrington Road Pond
East Branch Poplar Creek
Barrington Rd
Alexian Brothers Behavioral...
St Alexius Medical Center
Moon Lake Blvd
Poplar Creek Dr
Bridges of Poplar Creek Country Club
Golf Rd
Windsong Dr
Knollwood Dr
Walnut Creek Golf Course
Map data ©2014 Google 1000 ft

BDE 5401 Template (Rev. 09/05/2013)

# IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 08/12/2014

## PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: Barrington Road
Section:
County: Cook
Location: at I-90

Comments: Barrington Road at I-90
Scope on Barrington is Reconstruction

Design Date: 12/27/2013 ONP <-- BY
Modify Date: <-- BY

| | ADT | Year |
|---|---|---|
| Current: | 38,100 | 2012 |
| Future: | 69,000 | 2040 |

Facility Type: Unmarked State Route
# of Lanes = 6 or more

Road Class: I
Rural or Urban ? Urban
Subgrade Support Rating (SSR): Poor
Construction Year: 2015
Design Period (DP) = 20 years

| | Minimum ADT | Structural Design Traffic: Actual ADT | Actual %of Total ADT | % of ADT in Design Lane |
|---|---|---|---|---|
| PV = | No Min | 49,037 | 93.5% | P = 8% |
| SU = | No Min | 2,098 | 4.0% | S = 37% |
| MU = | No Min | 1,311 | 2.5% | M = 37% |
| Struct. Design ADT = | | 52,446 | (2025) | |

### TRAFFIC FACTOR CALCULATION

| FLEXIBLE PAVEMENT | | | RIGID PAVEMENT | | |
|---|---|---|---|---|---|
| Cpv = | 0.15 | | Cpv = | 0.15 | |
| Csu = | 132.5 | | Csu = | 143.81 | |
| Cmu = | 482.53 | | Cmu = | 696.42 | |
| TF flexible (Actual) = | 6.75 | (Actual ADT) | TF rigid (Actual) = | 9.00 | (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

### Full-Depth HMA Pavement

Use TF flexible = 6.75
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.R)
Goto Map
HMA Mixture Temp. = 74.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus ($E_{HMA}$) = 720 ksi (Fig. 54-5.D)
Design HMA Strain ($\varepsilon_{HMA}$) = 70 (Fig. 54-5.E)
Goto Map
Full Depth HMA Design Thickness = 11.25 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.50 in. (Fig. 54-5.I)

**Use Full-Depth HMA Thickness = 11.25 inches**

### JPC Pavement

Use TF rigid = 9.00
Edge Support = Tied Shoulder or C.&G.

**Rigid Pavt Thick. = 9.75 in. (Fig. 54-4.E)**

### CRC Pavement

Use TF rigid = 9.00
IBR value = 3

**CRCP Thickness = 8.75 in. (Fig. 54-4.M)**

TF MUST BE > 60 FOR CRCP

## RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

### HMA Overlay of Rubblized PCC

Use TF flexible = 6.75
Goto Map
HMA Overlay Design Thickness = 8.75 in. (Fig. 54-5.U)
Limiting Strain Criterion Thickness = 10.75 in. (Fig. 54-5.V)

**Use HMA Overlay Thickness = 8.75 inches**

### Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

**JPCP Thickness = NA inches**

CONTACT BMPR FOR ASSISTANCE

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

| Class I Roads | Class II Roads | Class III Roads | Class IV Roads |
|---|---|---|---|
| 4 lanes or more<br>Part of a future 4 lanes or more<br>One-way Streets with ADT > 3500 | 2 lanes with ADT > 2000<br>One way Street with ADT <= 3500 | 2 Lanes<br>(ADT 750 -2000) | 2 Lanes<br>(ADT < 750) |

| | Min. Str. Design Traffic (Fig 54-2.C) | | |
|---|---|---|---|
| Facility Type | PV | SU | MU |
| Interstate or Freeway | 0 | 500 | 1500 |
| Other Marked State Route | 0 | 250 | 750 |
| Unmarked State Route | No Min | No Min | No Min |

| Class Table for One-Way Streets | |
|---|---|
| ADT | Class |
| 0 - 3500 | II |
| >3501 | I |

| | Traffic Factor ESAL Coefficients | | | |
|---|---|---|---|---|
| | Rigid (Fig. 54-4.C) | | Flexible (Fig. 54-5.B) | |
| Class | Csu | Cmu | Csu | Cmu |
| I | 143.81 | 696.42 | 132.50 | 482.53 |
| II | 135.78 | 567.21 | 112.06 | 385.44 |
| III | 129.58 | 562.47 | 109.14 | 384.35 |
| IV | 129.58 | 562.47 | 109.14 | 384.35 |

| Class Table for 2 or 3 lanes (not future 4 lane & not one-way street) | |
|---|---|
| ADT | Class |
| 0 - 749 | IV |
| 750 - 2000 | III |
| >2000 | II |

| | Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B) | | | | | |
|---|---|---|---|---|---|---|
| | Rural | | | Urban | | |
| Number of Lanes | P | S | M | P | S | M |
| 1 Lane Ramp | 100% | 100% | 100% | 100% | 100% | 100% |
| 2 or 3 | 50% | 50% | 50% | 50% | 50% | 50% |
| 4 | 32% | 45% | 45% | 32% | 45% | 45% |
| 6 or more | 20% | 40% | 40% | 8% | 37% | 37% |

BDE 5401 Template (Rev. 09/05/2013) Printed: 08/12/2014

# LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

## FULL-DEPTH HMA PAVEMENT

**Standard Design**

| | | | |
|---|---|---|---|
| ROUTE | | Barrington Road | |
| SECTION | | | |
| COUNTY | | Cook | |
| LOCATION | | at I-90 | |
| FACILITY TYPE | | NON-INTERSTATE | |
| PROJECT LENGTH | | 3117 FT | = = > 0.59 Miles |
| # OF CENTERLINES | | 1 CL | |
| # OF LANES | | 6 LANES | |
| # OF EDGES | | 4 EP | |
| LANE WIDTH - AVERAGE | | 12 FT | |
| SHOULDER WIDTH | HMA Inside | 0 FT | |
| | HMA Outside | 0 FT | |
| | Total Width of Paved Shoulders | 0 FT | |

| | | |
|---|---|---|
| PAVEMENT THICKNESS (FLEXIBLE) | 11.25 IN | 14.50 IN MAX |
| SHOULDER THICKNESS | 8.00 IN | Standard Design |
| POLICY OVERLAY THICKNESS | 2.25 IN | |

| FLEX PAVEMENT TRAFFIC FACTORS | MINIMUM | ACTUAL | USE |
|---|---|---|---|
| | No Min | 6.75 | 6.75 |

Read Me!

| HMA COST PER TON | UNIT PRICE |
|---|---|
| HMA SURFACE | $95.00 / TON |
| HMA TOP BINDER | $95.00 / TON |
| HMA LOWER BINDER | $80.00 / TON |
| HMA BINDER (LEVELING) | $85.00 / TON |
| HMA SHOULDER | $72.00 / TON |

### INITIAL COSTS

| ITEM | THICKNESS | 100% QUANTITY | UNIT | UNIT PRICE | COST |
|---|---|---|---|---|---|
| HMA PAVEMENT ( FULL-DEPTH ) | ( 11.25" ) | 24,936 | SQ YD * | $46.08 / SQ YD | $1,149,051 ~ |
| HMA SURFACE COURSE | ( 2.00" ) | 2,806 | TONS | $95.00 / TON | $0 |
| HMA TOP BINDER COURSE | ( 2.25" ) | 3,187 | TONS | $95.00 / TON | $0 |
| HMA LOWER BINDER COURSE | ( 7.00" ) | 10,126 | TONS | $80.00 / TON | $0 |
| HMA SHOULDER | ( 8.00" ) | 0 | TONS | $72.00 / TON | $0 ~ |
| CURB & GUTTER | | 0 | LIN FT | $30.00 / LIN FT | $0 |
| SUBBASE GRAN MATL TY C (TONS) | | 113 | TONS | $25.00 / TON | $2,825 |
| IMPROVED SUBGRADE: | Modified Soil | 26,927 | SQ YD | $7.00 / SQ YD | $188,489 |
| Reserved For User Supplied Item | | 0 | UNITS | $0.00 / UNITS | $0 |
| Reserved For User Supplied Item | | 0 | UNITS | $0.00 / UNITS | $0 |
| PAVEMENT REMOVAL | | 24,936 | SQ YD | $15.00 / SQ YD | $374,040 |
| SHOULDER REMOVAL | | 0 | SQ YD | $0.00 / SQ YD | $0 |

Note: * Denotes User Supplied Quantity

| | |
|---|---|
| FLEXIBLE CONSTRUCTION INITIAL COST | $1,714,405 |
| FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE | $118,444 |

### MAINTENANCE COSTS:

| ITEM | | THICKNESS | MATERIAL | | UNIT COST |
|---|---|---|---|---|---|
| ROUTINE MAINTENANCE ACTIVITY | | | | | $0.00 LANE-MILE / YEAR |
| HMA OVERLAY PVMT SURF | | ( 2.00" ) | Surface Mix | 2.00 | $8.93 / SQ YD |
| HMA OVERLAY PVMT | | ( 2.25" ) | | 2.25 | $10.87 / SQ YD |
| HMA SURFACE MIX | | ( 1.50" ) | Surface Mix | 1.50 | $6.69 / SQ YD |
| HMA BINDER MIX | | ( 0.75" ) | eling Binder Mix | 0.75 | $4.18 / SQ YD |
| HMA OVERLAY SHLD | (Year 30) | ( 2.25" ) | Shoulder Mix | 2.25 | $9.07 / SQ YD |
| HMA OVERLAY SHLD | | ( 2.00" ) | Shoulder Mix | 2.00 | $8.06 / SQ YD |
| MILLING (2.00 IN) | | | | 2.00 | $3.00 / SQ YD |
| PARTIAL DEPTH PVMT PATCH | | (Mill & Fill Surf) | Surface Mix | 2.00 | $80.64 / SQ YD |
| PARTIAL DEPTH SHLD PATCH | | (Mill & Fill Surf) | Shoulder Mix | 2.00 | $78.06 / SQ YD |
| PARTIAL DEPTH PVMT PATCH | | (Mill & Fill +2.00 ") | Leveling Binder Mix | 2.00 | $79.52 / SQ YD |
| PARTIAL DEPTH SHLD PATCH | | (Mill & Fill +2.00 ") | Shoulder Mix | 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% Rehab = 110.00' / Station / Lane) | | | $2.00 / LIN FT |

| | |
|---|---|
| FLEXIBLE TOTAL LIFE-CYCLE COST | $2,266,619 |
| FLEXIBLE TOTAL ANNUAL COST PER MILE | $156,595 |

HMA_SD

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

08/12/14

FULL-DEPTH HMA PAVEMENT
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT
Figure 54-7.C
STANDARD DESIGN

| MAINTENANCE COSTS: | ITEM | % | QUANTITY | UNIT | UNIT COST | COST | PRESENT WORTH |
|---|---|---|---|---|---|---|---|
| YEAR 5 | | | | | | | |
| | LONG SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CNTR LINE JOINT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | RNDM / THRM CRACK R&S | 50.00% | 10,286 | LIN FT | $2.00 | $20,572 | |
| | PD PVMT PATCH M&F SURF | 0.10% | 25 | SQ YD | $80.64 | $2,016 | |
| | PWFn = | 0.8626 | | PW = | 0.8626 X | $53,758 | $46,372 |
| YEAR 10 | | | | | | | |
| | LONG SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CNTR LINE JOINT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | RNDM / THRM CRACK R&S | 50.00% | 10,286 | LIN FT | $2.00 | $20,572 | |
| | PD PVMT PATCH M&F SURF | 0.50% | 125 | SQ YD | $80.64 | $10,080 | |
| | PWFn = | 0.7441 | | PW = | 0.7441 X | $61,822 | $46,001 |
| YEAR 15 | | | | | | | |
| | MILL PVMT & SHLD 2.00" | 100.00% | 24,936 | SQ YD | $3.00 | $74,808 | |
| | PD PVMT PATCH M&F ADD'L 2.00" | 1.00% | 249 | SQ YD | $79.52 | $19,800 | |
| | HMA OVERLAY PVMT 2.00" | 100.00% | 24,936 | SQ YD | $8.93 | $222,678 | |
| | HMA OVERLAY SHLD 2.00 " | 100.00% | 0 | SQ YD | $8.06 | $0 | |
| | PWFn = | 0.6419 | | PW = | 0.6419 X | $317,286 | $203,654 |
| YEAR 20 | | | | | | | |
| | LONG SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CNTR LINE JOINT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | RNDM / THRM CRACK R&S | 50.00% | 10,286 | LIN FT | $2.00 | $20,572 | |
| | PD PVMT PATCH M&F SURF | 0.10% | 25 | SQ YD | $80.64 | $2,016 | |
| | PWFn = | 0.5537 | | PW = | 0.5537 X | $53,758 | $29,765 |
| YEAR 25 | | | | | | | |
| | LONG SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CNTR LINE JOINT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | RNDM / THRM CRACK R&S | 50.00% | 10,286 | LIN FT | $2.00 | $20,572 | |
| | PD PVMT PATCH M&F SURF | 0.50% | 125 | SQ YD | $80.64 | $10,080 | |
| | PWFn = | 0.4776 | | PW = | 0.4776 X | $61,822 | $29,527 |

HMA_SD

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| YEAR 30 | NON-INTERSTATE | | | | | | |
| | MILL PVMT & SHLD 2.00" | 100.00% | 24,936 | SQ YD | $3.00 | $74,808 | |
| | PD PVMT PATCH M&F ADD'L 2.00" | 2.00% | 499 | SQ YD | $79.52 | $39,680 | |
| | PD SHLD PATCH M&F ADD'L 2.00" | 1.00% | 0 | SQ YD | $78.06 | $0 | |
| | HMA OVERLAY PVMT 2.25 " | 100.00% | 24,936 | SQ YD | $10.87 | $271,054 | |
| | HMA OVERLAY SHLD 2.25 " | 100.00% | 0 | SQ YD | $9.07 | $0 | |
| | PWFn = | 0.4120 | | PW = | 0.4120 X | $385,542 | $158,838 |
| YEAR 35 | | | | | | | |
| | LONG SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CNTR LINE JOINT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | RNDM / THRM CRACK R&S | 50.00% | 10,286 | LIN FT | $2.00 | $20,572 | |
| | PD PVMT PATCH M&F SURF | 0.10% | 25 | SQ YD | $80.64 | $2,016 | |
| | PWFn = | 0.3554 | | PW = | 0.3554 X | $53,758 | $19,105 |
| YEAR 40 | | | | | | | |
| | LONG SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CNTR LINE JOINT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | RNDM / THRM CRACK R&S | 50.00% | 10,286 | LIN FT | $2.00 | $20,572 | |
| | PD PVMT PATCH M&F SURF | 0.50% | 125 | SQ YD | $80.64 | $10,080 | |
| | PWFn = | 0.3066 | | PW = | 0.3066 X | $61,822 | $18,952 |
| | | | | | | | $552,214 |
| | ROUTINE MAINTENANCE ACTIVITY | | 3.54 | Lane Miles | 0.00 | $0 | $0 |
| | | | | | MAINTENANCE LIFE-CYCLE COST | | $552,214 |
| 45 | YEAR LIFE CYCLE | CRFn = 0.0407852 | | | MAINTENANCE ANNUAL COST PER MILE | | $38,151 |

## PCC PAVEMENT

**JPCP**

| | | | | | |
|---|---|---|---|---|---|
| ROUTE | | | Barrington Road | | |
| SECTION | | | 0 | | |
| COUNTY | | | Cook | | |
| LOCATION | | | at I-90 | | |
| FACILITY TYPE | | | NON-INTERSTATE | | |
| PROJECT LENGTH | | | 3117 FT | = = > | 0.59 Miles |
| # OF CENTERLINES | | | 1 CL | | |
| # OF LANES | | | 6 LANES | | |
| # OF EDGES | | | 4 EP | | |
| LANE WIDTH - AVERAGE | | | 12 FT | | |
| SHOULDER WIDTH | PCC | Inside | 0 FT | | |
| | PCC | Outside | 0 FT | | |
| | Total Width of Paved Shoulders | | 0 FT | | |
| PAVEMENT THICKNESS (RIGID) | | JPCP | 9.75 IN | | TIED SHLD |
| SHOULDER THICKNESS | | | 9.75 IN | | |
| POLICY OVERLAY THICKNESS | | | 2.50 IN | | |

| RIGID PAVEMENT TRAFFIC FACTORS | | MINIMUM | ACTUAL | USE |
|---|---|---|---|---|
| | | No Min | 9.00 | 9.00 |
| Worksheet Construction Type is | Reconstruction | | The Pavement Type is | JPCP |

**INITIAL COSTS**

| ITEM | THICKNESS | 100% QUANTITY | UNIT | | UNIT PRICE | | COST |
|---|---|---|---|---|---|---|---|
| JPC PAVEMENT | ( 9.75" ) | 24,936 | SQ YD | | $43.05 | / SQ YD | $1,073,495 |
| PAVEMENT REINFORCEMENT | | 0 | SQ YD | | $22.00 | / SQ YD | $0 |
| STABILIZED SUBBASE | ( 4.00" ) | 0 | SQ YD | * | $19.00 | / SQ YD | $0 |
| PCC SHOULDERS | ( 9.75" to 9.75" ) | 0 | SQ YD | | $40.00 | / SQ YD | $0 |
| CURB & GUTTER | | 0 | LIN FT | | $30.00 | / LIN FT | $0 |
| SUBBASE GRAN MATL TY C | ( 0.00" ) | 0 | TONS | | $25.00 | / TON | $0 |
| IMPROVED SUBGRADE: | Modified Soil Width = 74.0' | 25,629 | SQ YD | | $7.00 | / SQ YD | $179,403 |
| Reserved For User Supplied Item | | 0 | UNITS | | $0.00 | / UNITS | $0 |
| Reserved For User Supplied Item | | 0 | UNITS | | $0.00 | / UNITS | $0 |
| PAVEMENT REMOVAL | | 24,936 | SQ YD | | $15.00 | / SQ YD | $374,040 |
| SHOULDER REMOVAL | | 0 | SQ YD | | $0.00 | / SQ YD | $0 |

Note: * Denotes User Supplied Quantity

| | |
|---|---|
| RIGID CONSTRUCTION INITIAL COST | $1,626,938 |
| RIGID CONSTRUCTION ANNUAL COST PER MILE | $112,401 |

**MAINTENANCE COSTS:**

| ITEM | THICKNESS | MATERIAL | T | UNIT COST | |
|---|---|---|---|---|---|
| ROUTINE MAINTENANCE ACTIVITY | | | | $0.00 | / LANE-MILE / YEAR |
| HMA POLICY OVERLAY | ( 2.50" ) | | 2.50 | | |
| HMA POLICY OVERLAY PVMT | ( 2.50" ) | 1.0059 | 2.50 | $12.26 | / SQ YD |
| HMA SURFACE MIX | ( 1.50" ) | 1.0035 | Surface Mix 1.50 | $6.69 | / SQ YD |
| HMA BINDER MIX | ( 1.00" ) | 1.0093 | aling Binder Mix 1.00 | $5.57 | / SQ YD |
| HMA POLICY OVERLAY SHLD | ( 2.50" ) | | Shoulder Mix 2.50 | $10.08 | / 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 (Mill & Fill HMA Surf) | | Surface Mix | 1.50 | $77.98 | / SQ YD |
| PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50") | | Surface Mix | 2.50 | $83.30 | / SQ YD |
| LONGITUDINAL SHOULDER JOINT ROUT & SEAL | | | | $2.00 | / LIN FT |
| 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' / Station / Lane) | | | $2.00 | / LIN FT |

| | |
|---|---|
| RIGID TOTAL LIFE-CYCLE COST | $1,986,852 |
| RIGID TOTAL ANNUAL COST PER MILE | $137,267 |

MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE 08/12/14

JOINTED PLAIN CONCRETE PAVEMENT
UNBONDED JOINTED PLAIN CONCRETE OVERLAY
Figure 54-7.A

| MAINTENANCE COSTS: | ITEM | % | QUANTITY | UNIT | UNIT COST | COST | PRESENT WORTH |
|---|---|---|---|---|---|---|---|
| YEAR 10 | | | | | | | |
| | PAVEMENT PATCH CLASS B | 0.10% | 25 | SQ YD | $150.00 | $3,750 | |
| | PWFn = | 0.7441 | | PW = | 0.7441 X | $3,750 | $2,790 |
| YEAR 15 | | | | | | | |
| | PAVEMENT PATCH CLASS B | 0.20% | 50 | SQ YD | $150.00 | $7,500 | |
| | PWFn = | 0.6419 | | PW = | 0.6419 X | $7,500 | $4,814 |
| YEAR 20 | | | | | | | |
| | PAVEMENT PATCH CLASS B | 2.00% | 499 | SQ YD | $150.00 | $74,850 | |
| | SHOULDER PATCH CLASS C | 0.50% | 0 | SQ YD | $145.00 | $0 | |
| | LONGITUDINAL SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CENTERLINE JT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | PWFn = | 0.5537 | | PW = | 0.5537 X | $106,020 | $58,701 |
| YEAR 25 | | | | | | | |
| | PAVEMENT PATCH CLASS B | 3.00% | 748 | SQ YD | $150.00 | $112,200 | |
| | SHOULDER PATCH CLASS C | 1.00% | 0 | SQ YD | $145.00 | $0 | |
| | PWFn = | 0.4776 | | PW = | 0.4776 X | $112,200 | $53,587 |
| YEAR 30 | NON-INTERSTATE | | | | | | |
| | PAVEMENT PATCH CLASS B | 4.00% | 997 | SQ YD | $150.00 | $149,550 | |
| | SHOULDER PATCH CLASS C | 1.50% | 0 | SQ YD | $145.00 | $0 | |
| | HMA POLICY OVERLAY 2.5" ( PVMT ) | 100.00% | 24,936 | SQ YD | $12.26 | $305,715 | |
| | HMA POLICY OVERLAY 2.5" ( SHLD ) | 100.00% | 0 | SQ YD | $10.08 | $0 | |
| | PWFn = | 0.4120 | | PW = | 0.4120 X | $455,265 | $187,563 |
| YEAR 35 | NON-INTERSTATE | | | | | | |
| | LONGITUDINAL SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CENTERLINE JT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | RANDOM CRACK R&S | 50.00% | 9,351 | LIN FT | $2.00 | $18,702 | |
| | REFLECTIVE TRANSVERSE CRACK R&S | 40.00% | 5,990 | LIN FT | $2.00 | $11,980 | |
| | PD PVMT PATCH M&F HMA 2.50" | 0.10% | 25 | SQ YD | $83.30 | $2,083 | |
| | PWFn = | 0.3554 | | PW = | 0.3554 X | $63,935 | $22,721 |
| YEAR 40 | NON-INTERSTATE | | | | | | |
| | PAVEMENT PATCH CLASS B | 0.50% | 125 | SQ YD | $150.00 | $18,750 | |
| | LONGITUDINAL SHLD JT R&S | 100.00% | 12,468 | LIN FT | $2.00 | $24,936 | |
| | CENTERLINE JT R&S | 100.00% | 3,117 | LIN FT | $2.00 | $6,234 | |
| | REFLECTIVE TRANSVERSE CRACK R&S | 60.00% | 8,986 | LIN FT | $2.00 | $17,972 | |
| | RANDOM CRACK R&S | 50.00% | 9,351 | LIN FT | $2.00 | $18,702 | |
| | PD PVMT PATCH M&F HMA 2.50" | 0.50% | 125 | SQ YD | $83.30 | $10,413 | |
| | PWFn = | 0.3066 | | PW = | 0.3066 X | $97,007 | $29,738 |
| | | | | | | | $359,914 |
| | ROUTINE MAINTENANCE ACTIVITY | | 3.54 | Lane Miles | $0.00 | $0 | $0 |
| | | | | | MAINTENANCE LIFE-CYCLE COST | | $359,914 |
| 45 | YEAR LIFE CYCLE | CRFn = 0.0407852 | | | MAINTENANCE ANNUAL COST PER MILE | | $24,866 |

## LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 4/15/14 10:26 AM

| | | | JPCP | HMA |
|---|---|---|---|---|
| CONSTRUCTION | INITIAL COST | PRESENT WORTH | $1,626,938 | $1,714,405 |
| | | ANNUAL COST PER MILE | $112,401 | $118,444 |
| MAINTENANCE | LIFE-CYCLE COST | PRESENT WORTH | $359,914 | $552,214 |
| | | ANNUAL COST PER MILE | $24,866 | $38,151 |
| TOTAL | LIFE-CYCLE COST | PRESENT WORTH | $1,986,852 | $2,266,619 |
| | | ANNUAL COST PER MILE | $137,267 | $156,595 |

## LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

| | | | | |
|---|---|---|---|---|
| LOWEST COST OPTION | ==========> | **JPCP** | **$137,267** | |
| OTHER OPTIONS (LOWEST TO HIGHEST): | TYPE / PERCENTAGE | **HMA** | **$156,595** | **14.1%** |

P:\Pavement Design Stuff\D-1\Barrington Road at I-90 [& I-72]\Pavement Design Files\[IDOT Mechanistic Design Barrington Rd.xlsm]LifeCycleCost

BDE 5401 Template (Rev. 09/05/2013)

# IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 08/12/2014

## PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: IL 72 (Higgins Road)
Section:
County: Cook
Location: west of Barrington Road

Comments: Barrington Road at I-90
Scope on IL 72 is Widening (No resurfacing)
Design Date: 12/27/2013 ONP <-- BY
Modify Date: <-- BY

| | ADT | Year |
|---|---|---|
| Current: | 31,500 | 2012 |
| Future: | 36,000 | 2040 |

Facility Type: Other Marked State Route
# of Lanes = 6 or more

Road Class: I
Rural or Urban ? Urban
Subgrade Support Rating (SSR): Poor
Construction Year: 2015
Design Period (DP) = 20 years

| | Minimum ADT | Structural Design Traffic: Actual ADT | Actual %of Total ADT | % of ADT in Design Lane |
|---|---|---|---|---|
| PV = | 0 | 31,238 | 93.0% | P = 8% |
| SU = | 250 | 1,008 | 3.0% | S = 37% |
| MU = | 750 | 1,344 | 4.0% | M = 37% |
| Struct. Design ADT = | | 33,589 | (2025) | |

### TRAFFIC FACTOR CALCULATION

**FLEXIBLE PAVEMENT**

| | | |
|---|---|---|
| Cpv = | 0.15 | |
| Csu = | 132.5 | |
| Cmu = | 482.53 | |
| TF flexible (Actual) = | 5.79 | (Actual ADT) |
| TF flexible (Min) = | 2.92 | (Min ADT Fig. 54-2.C) |

**RIGID PAVEMENT**

| | | |
|---|---|---|
| Cpv = | 0.15 | |
| Csu = | 143.81 | |
| Cmu = | 696.42 | |
| TF rigid (Actual) = | 8.00 | (Actual ADT) |
| TF rigid (Min) = | 4.13 | (Min ADT Fig. 54-2.C) |

## NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

**Full-Depth HMA Pavement**

Goto Map

| | | |
|---|---|---|
| Use TF flexible = | 5.79 | |
| PG Grade Lower Binder Lifts = | PG 64-22 | (Fig. 53-4.R) |
| HMA Mixture Temp. = | 74.0 | deg. F (Fig. 54-5.C) |
| Design HMA Mixture Modulus ($E_{HMA}$) = | 720 | ksi (Fig. 54-5.D) |
| Design HMA Strain ($\varepsilon_{HMA}$) = | 73 | (Fig. 54-5.E) |

Goto Map

| | | |
|---|---|---|
| Full Depth HMA Design Thickness = | 11.00 | in. (Fig. 54-5.F) |
| Limiting Strain Criterion Thickness = | 14.50 | in. (Fig. 54-5.I) |
| **Use Full-Depth HMA Thickness =** | **11.00** | **inches** |

**JPC Pavement**

| | | |
|---|---|---|
| Use TF rigid = | 8.00 | |
| Edge Support = | Tied | Shoulder or C.&G. |
| **Rigid Pavt Thick. =** | **9.50** | **in. (Fig. 54-4.E)** |

**CRC Pavement**

| | | |
|---|---|---|
| Use TF rigid = | 8.00 | |
| IBR value = | 3 | |
| **CRCP Thickness =** | **8.50** | **in. (Fig. 54-4.M)** |

**TF MUST BE > 60 FOR CRCP**

## RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

**HMA Overlay of Rubblized PCC**

Goto Map

| | | |
|---|---|---|
| Use TF flexible = | 5.79 | |
| HMA Overlay Design Thickness = | 8.25 | in. (Fig. 54-5.U) |
| Limiting Strain Criterion Thickness = | 10.75 | in. (Fig. 54-5.V) |
| **Use HMA Overlay Thickness =** | **8.25** | **inches** |

**Unbonded Concrete Overlay**

Review 54-4.03 for limitations and special considerations.

**JPCP Thickness = NA inches**

**CONTACT BMPR FOR ASSISTANCE**

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

| Class I Roads | Class II Roads | Class III Roads | Class IV Roads |
|---|---|---|---|
| 4 lanes or more<br>Part of a future 4 lanes or more<br>One-way Streets with ADT > 3500 | 2 lanes with ADT > 2000<br>One way Street with ADT <= 3500 | 2 Lanes<br>(ADT 750 -2000) | 2 Lanes<br>(ADT < 750) |

| | Min. Str. Design Traffic (Fig 54-2.C) | | |
|---|---|---|---|
| Facility Type | PV | SU | MU |
| Interstate or Freeway | 0 | 500 | 1500 |
| Other Marked State Route | 0 | 250 | 750 |
| Unmarked State Route | No Min | No Min | No Min |

| Class Table for One-Way Streets | |
|---|---|
| ADT | Class |
| 0 - 3500 | II |
| >3501 | I |

| | Traffic Factor ESAL Coefficients | | | |
|---|---|---|---|---|
| | Rigid (Fig. 54-4.C) | | Flexible (Fig. 54-5.B) | |
| Class | Csu | Cmu | Csu | Cmu |
| I | 143.81 | 696.42 | 132.50 | 482.53 |
| II | 135.78 | 567.21 | 112.06 | 385.44 |
| III | 129.58 | 562.47 | 109.14 | 384.35 |
| IV | 129.58 | 562.47 | 109.14 | 384.35 |

| Class Table for 2 or 3 lanes (not future 4 lane & not one-way street) | |
|---|---|
| ADT | Class |
| 0 - 749 | IV |
| 750 - 2000 | III |
| >2000 | II |

| | Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B) | | | | | |
|---|---|---|---|---|---|---|
| | Rural | | | Urban | | |
| Number of Lanes | P | S | M | P | S | M |
| 1 Lane Ramp | 100% | 100% | 100% | 100% | 100% | 100% |
| 2 or 3 | 50% | 50% | 50% | 50% | 50% | 50% |
| 4 | 32% | 45% | 45% | 32% | 45% | 45% |
| 6 or more | 20% | 40% | 40% | 8% | 37% | 37% |

# First Cost Analysis of Widening Project

| | | | | | |
|---|---|---|---|---|---|
| Date: | 4/25/2014 | | | Route | IL 72 |
| Quantities by: | ONP | Checked by: | | Section | Unk |
| Unit prices by: | MM | Checked by: | | County | Cook |
| | | Net Length | 2,556 ft | Project | Barrington Road @ I-90 |
| | | | | Contract | 13560 |

**Mechanistic Flexible**

| Area (Sq. Yd.) | Height (inches) | Weight (Tons) | Material | | Unit Cost | Total | ITEM # |
|---|---|---|---|---|---|---|---|
| | | 0 | HMA **Surface** Course, MIX "D" N50 | @ | | $0.00 | 40603335 |
| | | 0 | HMA **Surface** Course, MIX "D" N70 | @ | | $0.00 | 40603340 |
| | | 0 | Poly HMA **Surface** Course, MIX "F" N90 | @ | | $0.00 | 40603595 |
| 2556 | 1.75 | 250 | Poly HMA **Surface** Course, SMA N80 | @ | $92 | $23,044.90 | 40603153 |
| 2556 | 0.75 | 107 | Poly Level **Binder**, N50 | @ | $70 | $7,514.64 | 40600827 |
| 2556 | 8.5 | 1217 | HMA **Binder** course, IL-19, N70 | @ | $72 | $87,599.23 | 40603085 |
| | | 0 | HMA **Binder** course, IL-19, N90 | @ | | $0.00 | 40603090 |
| | | 0 | Poly HMA **Binder** course, IL-19, N90 | @ | | $0.00 | 40603240 |
| | | 0 | HMA **Binder** course, SMA, N80 | @ | | $0.00 | 40603148 |
| | NA | NA | 12" Aggregate Subgrade | @ | | $0.00 | 30300112 |
| | | | **Total** | | | **$118,158.77** | |

**Modified AASHTO**

| Area (Sq. Yd.) | Height (inches) | Weight (Tons) | Material | | Unit Cost | Total | ITEM # |
|---|---|---|---|---|---|---|---|
| | | 0 | HMA **Surface** Course, MIX "D" N50 | @ | | $0.00 | 40603335 |
| | | 0 | HMA **Surface** Course, MIX "D" N70 | @ | | $0.00 | 40603340 |
| | | 0 | Poly HMA **Surface** Course, MIX "F" N90 | @ | | $0.00 | 40603595 |
| 2556 | 1.75 | 250 | Poly HMA **Surface** Course, SMA N80 | @ | $92 | $23,044.90 | 40603153 |
| 2556 | 0.75 | 107 | Poly Level **Binder**, N50 | @ | $70 | $7,514.64 | 40600827 |
| 2556 | 11.25 | 1610 | HMA **Binder** course, IL-19, N70 | @ | $72 | $115,940.16 | 40603085 |
| | | 0 | HMA **Binder** course, IL-19, N90 | @ | | $0.00 | 40603090 |
| | | 0 | Poly HMA **Binder** course, IL-19, N90 | @ | | $0.00 | 40603240 |
| | | 0 | HMA **Binder** course, SMA, N80 | @ | | $0.00 | 40603148 |
| | NA | NA | 12" Aggregate Subgrade | @ | | $0.00 | 30300112 |
| | | | **Total** | | | **$146,499.70** | |

**Composite**

| Area (Sq. Yd.) | Height (inches) | Weight (Tons) | Material | | Unit Cost | Total | ITEM # |
|---|---|---|---|---|---|---|---|
| | | 0 | HMA **Surface** Course, MIX "D" N50 | @ | | $0.00 | 40603335 |
| | | 0 | HMA **Surface** Course, MIX "D" N70 | @ | | $0.00 | 40603340 |
| 2556 | 0.75 | 107 | Poly Level Binder, N50 | @ | $70 | $7,514.64 | 40600827 |
| 2556 | 1.75 | 250 | Poly HMA **Surface** Course, SMA N80 | @ | $92 | $23,044.90 | 40603153 |
| 2556 | 10 | NA | PCC Base Course | @ | $55 | $140,580.00 | 35300500 |
| | NA | NA | 12" Aggregate Subgrade | @ | | $0.00 | 30300112 |
| | | | **Total** | | | **$171,139.54** | |

**BARRINGTON RD – TYPICAL SECTION**

Sta. 333+28 to 335+55

**BARRINGTON RD – TYPICAL SECTION**

Sta. 336+85 to 337+60

## NOTES

*PROPOSED PEDESTRIAN WALKWAY BEGINS AT STA. 329+40

**BARRINGTON RD – TYPICAL SECTION**

Sta. 337+59 to 342+00

## LEGEND

1. COMB. CONC. CURB & GUTTER, TYPE B-6.24
2. COMB. CONC. CURB & GUTTER, TYPE B-6.12
3. STABILIZED SHOULDER, 10"
4. SHARED-USE PATH
5. PCC SIDEWALK
6. CONCRETE MEDIAN SURFACE
7. TOPSOIL AND SEEDING
8. AGGREGATE BASE COURSE 12"
9. SUBDRAIN 4"
10. FABRIC ENVELOPE
11. GUTTER, TYPE G-2
12. TOPSOIL, FURNISH AND PLACE 6"
13. TIE BAR ¾"
14. AGGREGATE BASE COURSE 6"

CMT
CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS

| | | | |
|---|---|---|---|
| MODEL NAME = Default | DESIGNED - JWD | REVISED - | |
| FILE NAME = P9518011-Qs001_BRDN_1.dgn | DRAWN - JPZ | REVISED - | |
| PLOT SCALE = 20.0000 '/in. | CHECKED - JWD | REVISED - | |
| PLOT DATE = 8/2/2013 | DATE - 7/26/13 | REVISED - | |

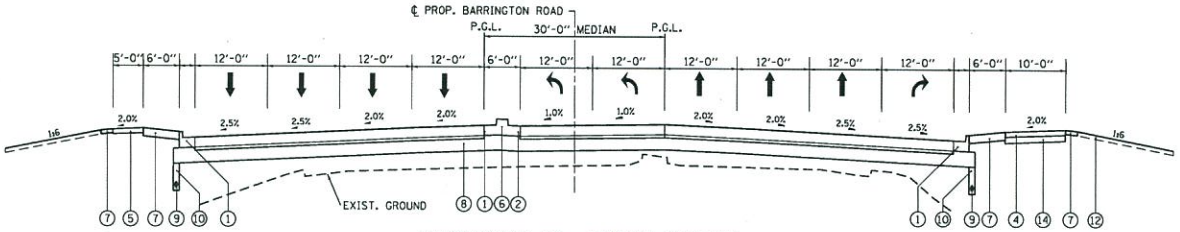
VILLAGE OF HOFFMAN ESTATES

**PROPOSED TYPICAL SECTIONS**
**BARRINGTON ROAD**

SCALE: N.T.S. | SHEET 1 OF 4 SHEETS | STA. 333+28 TO STA. 339+00

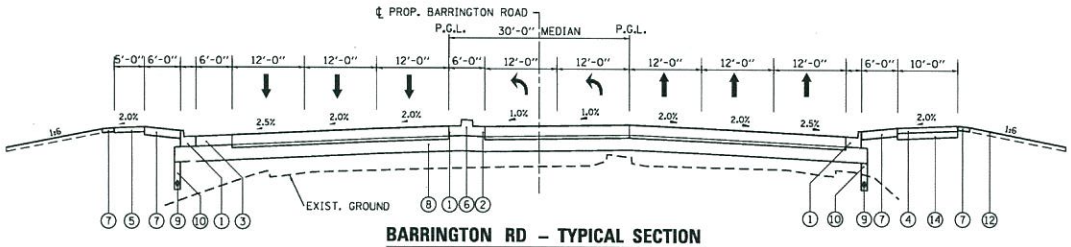
| F.A.P. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 0362 | | COOK | 6 | 1 |

ILLINOIS FED. AID PROJECT




**BARRINGTON RD – TYPICAL SECTION**

Sta. 342+00 to 346+50




**BARRINGTON RD – TYPICAL SECTION**

Sta. 346+50 to 348+50

## LEGEND

1. COMB. CONC. CURB & GUTTER, TYPE B-6.24
2. COMB. CONC. CURB & GUTTER, TYPE B-6.12
3. STABILIZED SHOULDER, 10"
4. SHARED-USE PATH
5. PCC SIDEWALK
6. CONCRETE MEDIAN SURFACE
7. TOPSOIL AND SEEDING
8. AGGREGATE BASE COURSE 12"
9. SUBDRAIN 4"
10. FABRIC ENVELOPE
11. GUTTER, TYPE G-2
12. TOPSOIL, FURNISH AND PLACE 6"
13. NOT USED
14. AGGREGATE BASE COURSE 6"

DIRECTORY: SHEETS
USER-NAME: 1163

| | | | |
|---|---|---|---|
| CMT CRAWFORD, MURPHY & TILLY, INC. CONSULTING ENGINEERS License No. 184-000613 | MODEL NAME = Default | DESIGNED - JWD | REVISED - |
| | FILE NAME = P9518911-Qx001_BRDN_2.dgn | DRAWN - JPZ | REVISED - |
| | PLOT SCALE = 20.0000 ' / in. | CHECKED - JWD | REVISED - |
| | PLOT DATE = 8/22/2013 | DATE - 7/26/13 | REVISED - |

Barrington Road at I-90 interchange

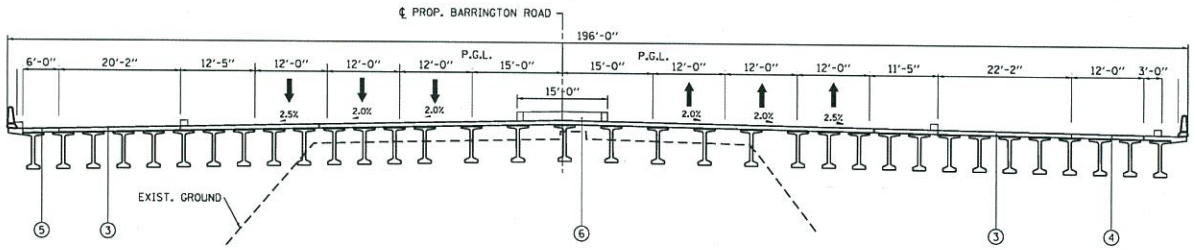
**VILLAGE OF HOFFMAN ESTATES**

**PROPOSED TYPICAL SECTIONS**
**BARRINGTON ROAD**

SCALE: N.T.S. | SHEET 2 OF 4 SHEETS | STA. 341+00 TO STA. 348+50

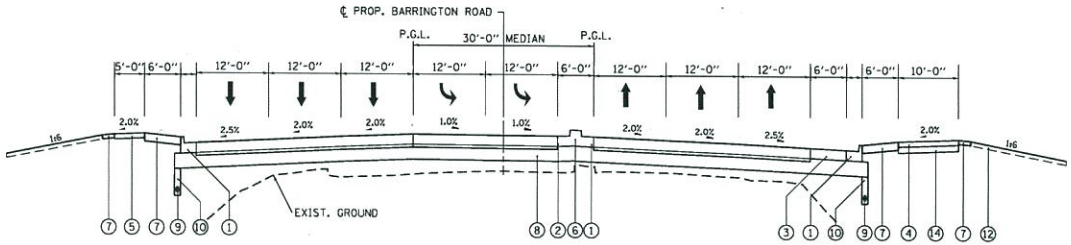
| F.A.P. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 0362 | | COOK | 6 | 2 |

ILLINOIS FED. AID PROJECT



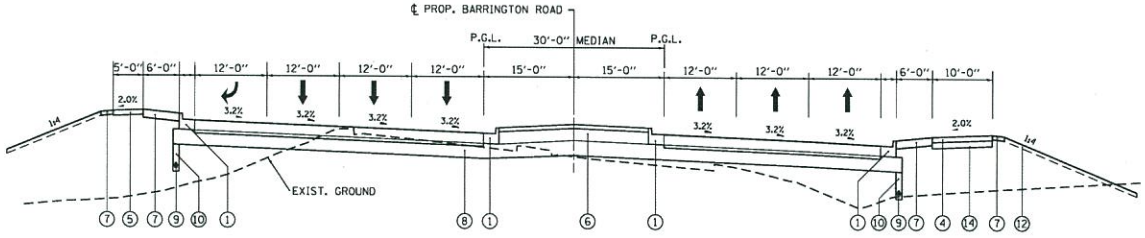

## BARRINGTON RD – TYPICAL SECTION

Sta. 350+00 (℄ OF PIER)




## BARRINGTON RD – TYPICAL SECTION

Sta. 351+50 to 353+50




## BARRINGTON RD – TYPICAL SECTION

Sta. 355+00 to 357+00

## LEGEND

1. COMB. CONC. CURB & GUTTER, TYPE B-6.24
2. COMB. CONC. CURB & GUTTER, TYPE B-6.12
3. STABILIZED SHOULDER, 10"
4. SHARED-USE PATH
5. PCC SIDEWALK
6. CONCRETE MEDIAN SURFACE
7. TOPSOIL AND SEEDING
8. AGGREGATE BASE COURSE 12"
9. SUBDRAIN 4"
10. FABRIC ENVELOPE
11. GUTTER, TYPE G-2
12. TOPSOIL, FURNISH AND PLACE 6"
13. NOT USED
14. AGGREGATE BASE COURSE 6"

| | | | |
|---|---|---|---|
| CMT CRAWFORD, MURPHY & TILLY, INC. CONSULTING ENGINEERS License No. 184-000613 | MODEL NAME = Default | DESIGNED - JWD | REVISED - |
| | FILE NAME = P0518911-Qx001_BRDN_3.dgn | DRAWN - JPZ | REVISED - |
| | PLOT SCALE = 20.0000 ' / in. | CHECKED - JWD | REVISED - |
| | PLOT DATE = 8/22/2013 | DATE - 7/26/13 | REVISED - |

Barrington Road at I-90 Interchange

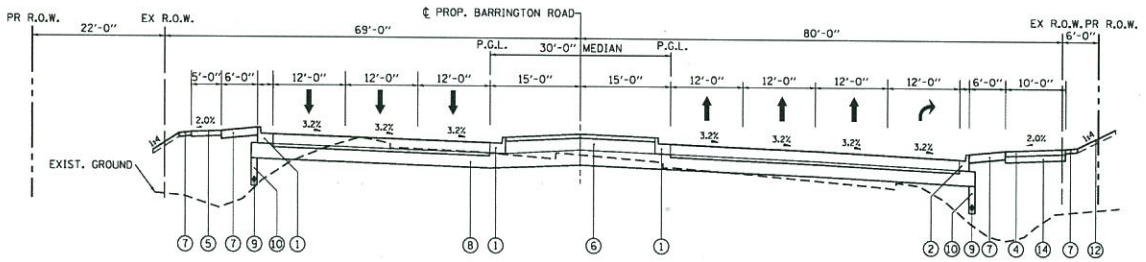
VILLAGE OF HOFFMAN ESTATES

PROPOSED TYPICAL SECTIONS
BARRINGTON ROAD

SCALE: N.T.S. | SHEET 3 OF 4 SHEETS | STA. 350+00 TO STA. 357+00

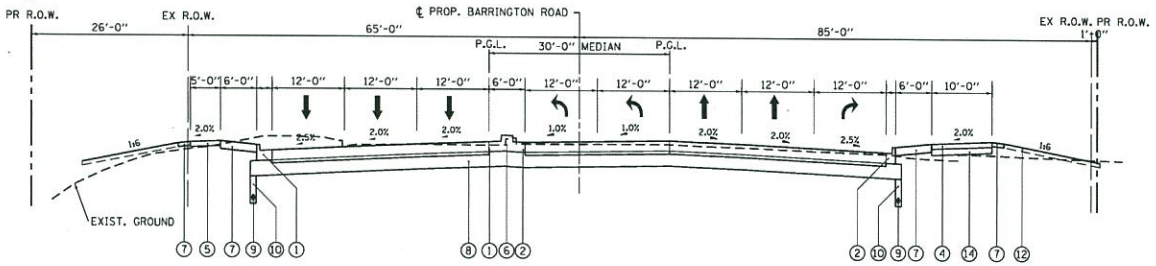
| F.A.P. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 0362 | | COOK | 6 | 3 |

ILLINOIS FED. AID PROJECT



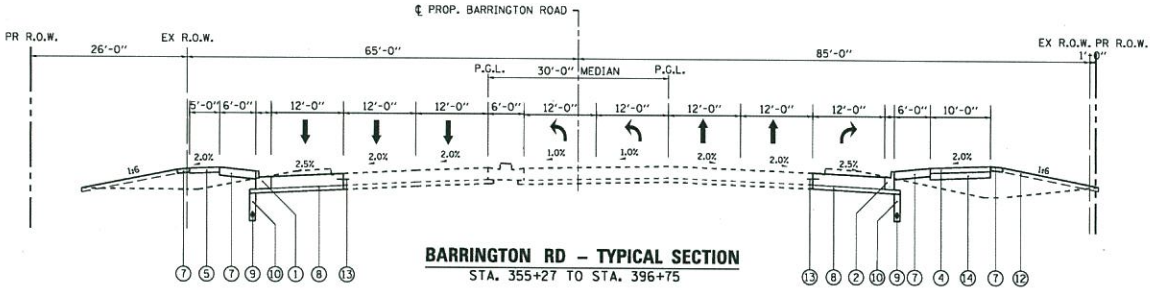

**BARRINGTON RD – TYPICAL SECTION**

Sta. 358+50 to 363+00




**BARRINGTON RD – TYPICAL SECTION**

Sta. 364+00 to 364+50




**BARRINGTON RD – TYPICAL SECTION**

STA. 355+27 TO STA. 396+75

## LEGEND

1. COMB. CONC. CURB & GUTTER, TYPE B-6.24
2. COMB. CONC. CURB & GUTTER, TYPE B-6.12
3. STABILIZED SHOULDER, 10"
4. SHARED-USE PATH
5. PCC SIDEWALK
6. CONCRETE MEDIAN SURFACE
7. TOPSOIL AND SEEDING
8. AGGREGATE BASE COURSE 12"
9. SUBDRAIN 4"
10. FABRIC ENVELOPE
11. GUTTER, TYPE G-2
12. TOPSOIL, FURNISH AND PLACE 6"
13. TIE BAR ¾"
14. AGGREGATE BASE COURSE 6"

EMBEDDED FILES
LOGO.JPG

CMT
CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS
License No. 184-000813

| | | |
|---|---|---|
| MODEL NAME = Default | DESIGNED - JWD | REVISED - |
| FILE NAME = P0518811-Cx001_BRDN_4.dgn | DRAWN - JPZ | REVISED - |
| PLOT SCALE = 20.0000 '/ in. | CHECKED - JWD | REVISED - |
| PLOT DATE = 6/20/2013 | DATE - 7/26/13 | REVISED - |

Barrington Road at I-90 Interchange

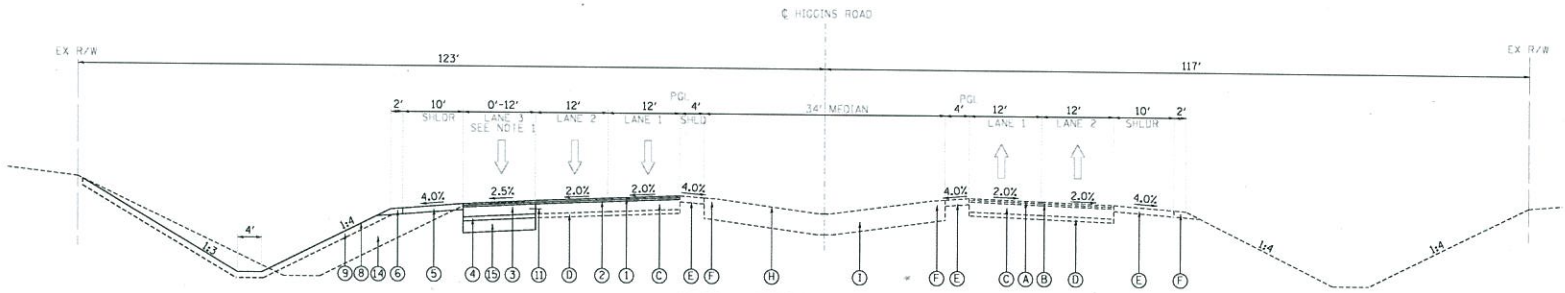
VILLAGE OF
HOFFMAN ESTATES

**PROPOSED TYPICAL SECTIONS**
**BARRINGTON ROAD**

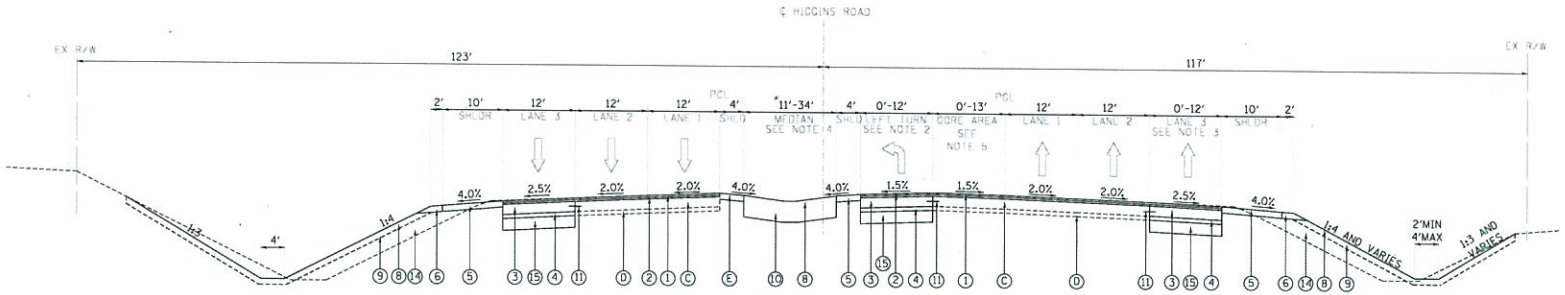
SCALE: N.T.S. | SHEET 4 OF 4 SHEETS | STA. 358+50 TO STA. 396+75

| F.A.P. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 0362 | | COOK | 6 | 4 |

ILLINOIS FED. AID PROJECT




RURAL - PROPOSED HIGGINS ROAD
STA. 586+07 TO STA. 593+28




RURAL - PROPOSED HIGGINS ROAD
STA. 593+28 TO STA. 598+21
STA. 599+87 TO STA. 611+55

GREENSPOINT PKWY. (WEST) AND HIGGINS RD. INTERSECTION
STA. 598+21 TO STA. 599+87
GREENSPOINT PKWY. (EAST) AND HIGGINS RD. INTESECTION
STA. 611+55 TO STA. 613+18

PROPOSED LEGEND

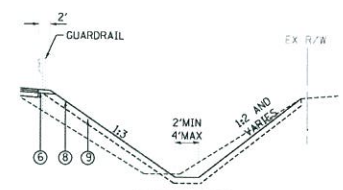
1. HMA SURFACE COURSE, 1¾"
2. HMA BINDER COURSE, 1¾"
3. PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)
4. SUB-BASE GRANULAR MATERIAL, TYPE B, 4"
5. ASHPALT SHOULDER, 6"
6. AGGREGATE SHOULDERS, TYPE B
7. PORTLAND CEMENT CONCRETE SIDEWALK, 5"
8. SEEDING, CLASS 2A
9. TOPSOIL FURNISH AND PLACE, 6"
10. TOPSOIL FURNISH AND PLACE, 24"
11. TIE BAR ¾"
12. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24 ADJACENT TO MAINLINE
13. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.12 ADJACENT TO AUXILIARY LANES
14. FURNISHED EXCAVATION
15. AGGREGATE BASE COURSE 12"

EXISTING LEGEND

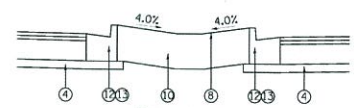
- (A) BINDER COURSE, 1¾"
- (B) BITUMINOUS CONCRETE SURFACE COURSE, 1¾"
- (C) PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)
- (D) SUB-BASE GRANULAR MATERIAL, TYPE B, 4"
- (E) ASPHALT SHOULDER, 6"
- (F) AGGREGATE SHOULDERS, TYPE B
- (G) PORTLAND CEMENT CONCRETE SIDEWALK, 5"
- (H) SODDING, SALT TOLERANT
- (I) TOPSOIL FURNISH AND PLACE, 24"
- (J) COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24 OR B-6.12

NOTES

1. LANE TAPERS FROM 0' TO 12' FROM STA. 586+07 TO STA. 592+09.
2. LANE TAPERS FROM 0' TO 12' FROM STA. 593+28 TO STA. 595+71 AND FROM STA. 607+34 TO STA. 609+34.
3. LANE TAPERS FROM 0' TO 12' FROM STA. 593+28 TO STA. 595+72.
4. EXISTING LANDSCAPED MEDIAN FROM STA. 600+36 TO STA. 607+34
5. GORE AREA TAPERS FROM 0' TO 13' FROM STA. 595+71 TO STA. 598+21 AND FROM STA. 609+34 TO STA. 611+55.




GUARDRAIL DETAIL
STA. 595+00 TO STA. 605+50




*MEDIAN DETAIL
STA. 594+64 TO STA. 598+21
WIDTH 27'-10'
STA. 599+87 TO STA. 600+13
WIDTH 34'-31'
STA. 611+16 TO STA. 611+55
WIDTH 12'-11'

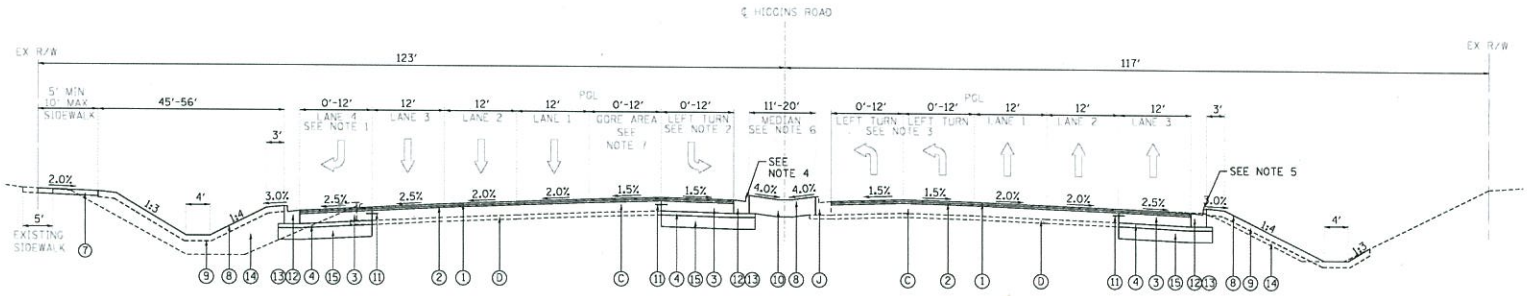
| | | | | | |
|---|---|---|---|---|---|
| CMT CRAWFORD, MURPHY & TILLY, INC. CONSULTING ENGINEERS License No. 184-000613 | Default P9518911-Qx302_HGNS_1.dgn | DESIGNED JWD | REVISED | Barrington Road at a 90 Interchange | VILLAGE OF HOFFMAN ESTATES |
| | | DRAWN JWD | REVISED | | |
| | | CHECKED CMC | REVISED | | |
| | | DATE 7/26/13 | REVISED | | |

PROPOSED TYPICAL SECTIONS
HIGGINS ROAD – RURAL

SCALE: 1"=20' SHEET 1 OF 2 SHEETS STA. 586+07 TO STA. 611+55

| F.A.P. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 0362 | | COOK | 6 | 5 |

P-91-589-11
ILLINOIS FED. AID PROJECT




RURAL - PROPOSED HIGGINS ROAD
STA. 613+18 TO STA. 617+46

PROPOSED LEGEND

1. HMA SURFACE COURSE, 1¾"
2. HMA BINDER COURSE, 1¾"
3. PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)
4. SUB-BASE GRANULAR MATERIAL, TYPE B, 4"
5. ASHPALT SHOULDER, 6"
6. AGGREGATE SHOULDERS, TYPE B
7. PORTLAND CEMENT CONCRETE SIDEWALK, 5"
8. SEEDING, CLASS 2A
9. TOPSOIL FURNISH AND PLACE, 6"
10. TOPSOIL FURNISH AND PLACE, 24"
11. TIE BAR ¾"
12. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24 ADJACENT TO MAINLINE
13. COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.12 ADJACENT TO AUXILIARY LANES
14. FURNISHED EXCAVATION
15. AGGREGATE BASE COURSE 12"

EXISTING LEGEND

- (A) BINDER COURSE, 1¾"
- (B) BITUMINOUS CONCRETE SURFACE COURSE, 1¾"
- (C) PORTLAND CEMENT CONCRETE PAVEMENT, 10" (JOINTED)
- (D) SUB-BASE GRANULAR MATERIAL, TYPE B, 4"
- (E) ASPHALT SHOULDER, 6"
- (F) AGGREGATE SHOULDERS, TYPE B
- (G) PORTLAND CEMENT CONCRETE SIDEWALK, 5"
- (H) SODDING, SALT TOLERANT
- (I) TOPSOIL FURNISH AND PLACE, 24"
- (J) COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.24 OR B-6.12

NOTES

1. LANE TAPERS FROM 0' TO 12' FROM STA. 615+26 TO STA. 617+46.
2. LANE TAPERS FROM 0' TO 12' FROM STA. 617+46 TO STA. 619+35.
3. LANES TAPERS FROM 0' TO 24' FROM STA. 614+59 TO STA. 619+35.
4. EXISTING CONCRETE CURB AND GUTTER BEGINS AT STA. 615+26.
5. PROPOSED CONCRETE CURB AND GUTTER CONTINUES TO STA. 619+08.
6. EXISTING LANDSCAPED MEDIAN FROM BEGINS AT STA. 615+27
7. GORE AREA TAPERS FROM 12' TO 0' FROM STA. 613+18 TO STA. 615+26

CMT
CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS
License No. 184-005813

| | |
|---|---|
| DESIGNED | JWD |
| DRAWN | JWD |
| CHECKED | CMC |
| DATE | 7/26/13 |

REVISED
REVISED
REVISED
REVISED

Barrington Road at I-90 Interchange

VILLAGE OF
HOFFMAN ESTATES

PROPOSED TYPICAL SECTIONS
HIGGINS ROAD – RURAL

SCALE: 1"=20' SHEET 2 OF 2 SHEETS STA. 611+55 TO STA. 617+46

| F.A.P. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 0362 | | COOK | 6 | 6 |
| | | | P-91-589-11 | |

ILLINOIS FED. AID PROJECT