SECTION A-A

LEGEND

A  Typical HMA overlay, mainline
B  Typical HMA overlay, shoulder
C  HMA for approaches
D  Surface milling, asphalt
**GENERAL NOTES**

These notes are for Standard Drawings E 610-PRAP-02, -03, and -04.

**1.** Embankment slopes on either side of an approach or drive within the median clear zone for new construction/reconstruction projects or the obstruction free zone on 3-lane projects should conform to the following table:

<table>
<thead>
<tr>
<th>DESIGN YEAR</th>
<th>High, ≥ 50 mph</th>
<th>Low, ≤ 45 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design YearAADT</td>
<td>≥ 8500</td>
<td>&lt; 8500</td>
</tr>
<tr>
<td>Multi-Lane Divided, All Functional Class</td>
<td>Incoming Slope</td>
<td>1:1</td>
</tr>
<tr>
<td></td>
<td>Outgoing Slope</td>
<td>4:1</td>
</tr>
<tr>
<td>Multi-Lane Undivided, All Functional Class</td>
<td>Incoming Slope</td>
<td>1:1</td>
</tr>
<tr>
<td></td>
<td>Outgoing Slope</td>
<td>4:1</td>
</tr>
<tr>
<td>2-Lane Arterial or Collector</td>
<td>4:1</td>
<td>4:1</td>
</tr>
<tr>
<td>2-Lane Local Road</td>
<td>4:1</td>
<td>4:1</td>
</tr>
</tbody>
</table>

Outside the clear zone or the obstruction free zone, the embankment slopes should ideally be 4:1 but not steeper than 3:1.

**2.** Cross culverts under the public road approach which cannot be located outside the median clear zone will require appropriate and treatments.

**3.** The cross hatched shoulder area indicates the limits where the shoulder is the same as the approach pavement.

**4.** If the approach is to be constructed of PCCP, the details shall be as shown elsewhere in the plans for thickness, joint type, and location.

**5.** Both shoulder shall be used with the Type A public road approach. The Type B public road approach shall have 6 in. compacted aggregate and full approach pavement section shoulders as shown on the Type A approach detail.

**6.** If the AIT for the public road is greater than 1,000, the required pavement section shall be as shown elsewhere in the plans.

---

**INFORMATION DEPARTMENT OF TRANSPORTATION**

**PUBLIC ROAD APPROACH**

**TYPE A & B - GENERAL NOTES**

**SEPTEMBER 2007**

**STANDARD DRAWING NO. E 610-PRAP-04**

---

**Design Standards Engineer:**

**Mark R. Miller** 05/04/07

**Date:**

---

**Design Standards Engineer:**

**Richard L. Yarn Crater** 09/24/07

**Date:**
### LEGEND

\( \alpha = \text{ANGLE OF TURN} \)

The angle through which a vehicle travels on the public road approach toward making a right-hand turn. It is measured from the extension of the tangent on which a vehicle approaches the intersecting road to the corresponding tangent on the intersecting road to which the vehicle turns.

\( \beta = \text{INTERSECTION CONTROL ANGLE} \)

### NOTES:

1. See Standard Drawing E 610-PRAP-02 for public road approach type A.
2. See Standard Drawing E 610-PRAP-03 for public road approach type B.

### INDIANA DEPARTMENT OF TRANSPORTATION
PUBLIC ROAD APPROACH TYPE A & TYPE B – TABLE OF VALUE

#### SEPTEMBER 2001

**STANDARD DRAWING NO. E 610-PRAP-05**

<table>
<thead>
<tr>
<th>B</th>
<th>U</th>
<th>S</th>
<th>M</th>
<th>X</th>
<th>Y</th>
<th>N</th>
<th>L</th>
<th>TOTAL APPROACH AREA A</th>
<th>Curb &amp; shoulder area</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+)</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
<td>(ft)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>35.02</td>
<td>65.23</td>
<td>11.66</td>
<td>18.63</td>
<td>33.20</td>
<td>3.72</td>
<td>10.97</td>
<td>10.89</td>
<td>10.60</td>
</tr>
<tr>
<td>110</td>
<td>53.75</td>
<td>64.04</td>
<td>11.42</td>
<td>19.32</td>
<td>33.74</td>
<td>3.96</td>
<td>12.47</td>
<td>12.82</td>
<td>12.37</td>
</tr>
<tr>
<td>200</td>
<td>52.51</td>
<td>62.88</td>
<td>11.19</td>
<td>20.02</td>
<td>34.28</td>
<td>4.02</td>
<td>10.38</td>
<td>12.63</td>
<td>10.86</td>
</tr>
<tr>
<td>300</td>
<td>51.30</td>
<td>61.74</td>
<td>9.94</td>
<td>20.72</td>
<td>34.84</td>
<td>4.07</td>
<td>11.48</td>
<td>10.84</td>
<td>10.50</td>
</tr>
<tr>
<td>400</td>
<td>50.11</td>
<td>60.56</td>
<td>8.70</td>
<td>21.44</td>
<td>34.40</td>
<td>4.13</td>
<td>10.31</td>
<td>11.27</td>
<td>10.40</td>
</tr>
</tbody>
</table>

### Diagram Description

- **Direction of traffic**
- **\( \beta = 180^\circ - \alpha \)**

The diagram outlines the design standards for road approaches, including the calculation of approach area and shoulder area, as well as the relationship between the angle of turn and the intersection control angle.
NOTES:
1. The pay limits shown herein generally apply to Types A, B, C, and D Public Road Approaches as shown on Standard Drawings E 610-PRAA-02, -03, -06, and -10 respectively.
GENERAL NOTES
These notes are for Standard Drawings E 610-PRAP-06 and E 610-PRAP-08.

1. See Table on Standard Drawing E 610-PRAP-04 for
   embankment slopes to be built on either side of
   the approach.

2. Cross culverts under the public road approach
   which cannot be located outside the road/clear
   zone will require appropriate and treatments
   at each and as shown on plans.

3. If the approach is to be constructed of concrete,
   the details shall be as shown elsewhere in
   the plans for pavement thickness, joint type,
   and location.

4. The cross hatched □□□□ shoulder area
   indicates the limits where the shoulder is the
   same section as the approach pavement.

5. The pavement section for the auxiliary lane shall
   be as detailed elsewhere in the plans.

6. If the ADT for the public road is greater
   than 1000, the required pavement section shall
   be as shown elsewhere in the plans.

7. See Standard Drawing E 610-PRAP-07
   for pay limit details.
### Table of Values

<table>
<thead>
<tr>
<th>B</th>
<th>L</th>
<th>S</th>
<th>U</th>
<th>X</th>
<th>Y</th>
<th>V</th>
<th>Shoulder gap</th>
<th>Chord</th>
<th>M</th>
<th>Approach Areas</th>
<th>Auxiliary lane part area</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>98.95</td>
<td>54.59</td>
<td>61.38</td>
<td>18.63</td>
<td>33.20</td>
<td>25.54</td>
<td>230.12</td>
<td>63.16</td>
<td>33.68</td>
<td>15.45</td>
<td>372.16</td>
</tr>
<tr>
<td>109</td>
<td>97.59</td>
<td>53.46</td>
<td>60.31</td>
<td>19.32</td>
<td>33.74</td>
<td>25.30</td>
<td>232.43</td>
<td>62.72</td>
<td>34.31</td>
<td>15.77</td>
<td>381.89</td>
</tr>
<tr>
<td>108</td>
<td>96.26</td>
<td>52.36</td>
<td>59.26</td>
<td>20.02</td>
<td>34.20</td>
<td>25.24</td>
<td>233.43</td>
<td>62.29</td>
<td>34.94</td>
<td>14.90</td>
<td>386.42</td>
</tr>
<tr>
<td>107</td>
<td>94.95</td>
<td>51.28</td>
<td>58.24</td>
<td>20.72</td>
<td>34.84</td>
<td>25.10</td>
<td>236.18</td>
<td>61.85</td>
<td>35.56</td>
<td>14.63</td>
<td>393.41</td>
</tr>
<tr>
<td>106</td>
<td>93.68</td>
<td>50.23</td>
<td>57.24</td>
<td>21.44</td>
<td>35.40</td>
<td>24.97</td>
<td>237.61</td>
<td>61.40</td>
<td>36.19</td>
<td>14.36</td>
<td>399.03</td>
</tr>
<tr>
<td>105</td>
<td>92.42</td>
<td>49.21</td>
<td>56.27</td>
<td>22.16</td>
<td>35.98</td>
<td>24.85</td>
<td>237.10</td>
<td>60.95</td>
<td>36.81</td>
<td>14.09</td>
<td>402.99</td>
</tr>
<tr>
<td>104</td>
<td>91.19</td>
<td>48.20</td>
<td>55.32</td>
<td>22.86</td>
<td>36.56</td>
<td>24.74</td>
<td>236.62</td>
<td>60.50</td>
<td>37.43</td>
<td>13.83</td>
<td>406.52</td>
</tr>
<tr>
<td>103</td>
<td>89.99</td>
<td>47.22</td>
<td>54.30</td>
<td>23.52</td>
<td>37.16</td>
<td>24.63</td>
<td>236.18</td>
<td>60.04</td>
<td>38.04</td>
<td>13.56</td>
<td>408.87</td>
</tr>
<tr>
<td>102</td>
<td>88.80</td>
<td>46.25</td>
<td>53.38</td>
<td>23.94</td>
<td>37.67</td>
<td>24.54</td>
<td>235.79</td>
<td>59.58</td>
<td>38.66</td>
<td>13.30</td>
<td>410.12</td>
</tr>
<tr>
<td>101</td>
<td>87.64</td>
<td>45.31</td>
<td>52.40</td>
<td>24.50</td>
<td>38.39</td>
<td>24.45</td>
<td>235.44</td>
<td>59.11</td>
<td>39.27</td>
<td>13.04</td>
<td>411.36</td>
</tr>
</tbody>
</table>

#### Notes:

1. See Standard Drawing E 610-PRAP-06 for public road approach type C.
2. See Standard Drawing E 610-PRAP-08 for General Notes.

### Legend

- **α**: Angle of Turn
  - It is the angle which a vehicle travels on the public road approach toward making a right hand turn. It is measured from the extension of the tangent on which a vehicle approaches the intersecting road to the corresponding tangent on the intersecting road to which the vehicle turns.

- **β**: Intersection Control Angle
  - \( \beta = 180° - \alpha \)

### Directions of Traffic

![Diagram showing directions of traffic with α and β angles]
EXAMPLE FOR TYPE D, W = 3\Z
Intersection centerline angle $\theta = 128\degree$

\[ \begin{align*}
L &= 111.25' \\
S &= 32.54' \\
U &= 89.74' \\
V &= 35.33' \\
V' &= 34.37' \\
\text{Total area} &= 777.18 \text{ sqy} \\
(\text{Area excludes partial auxiliary lane})
\end{align*} \]

End paved shoulder opposite the active point in sheet from the edge of pavement.

$\text{Width of section in place}$

8 in. Compacted aggregate shoulder

$\text{Rate of transition} 10:1$

$\text{End paved shoulder}$

$\text{Shoulder line}$

$\text{Partial length of auxiliary lane}$

$\text{Length of light turn lane}$

$\text{90\degree taper}$

$\text{Direction of travel}$

$\text{PUBLIC ROAD APPROACH TYPE D}$

$\text{SECTION A-A MINIMUM PAVEMENT SECTION}$

$\text{FOR < NC: TYPICAL CLASS V OR ABOVE PER DAY}$

10\% 8 in. HMA Surfacing 0.5 in. Type A on
4 in. 8 in. HMA Intermedian 10.0 in. Type A on
8 in. compacted aggregate base 950

$\text{SECTION B-B}$

$\text{PUBLIC ROAD APPROACH TYPE D}$

$\text{MARCH 2009}$

$\text{STANDARD DRAWING NO. E 916-PRA-10}$

$\text{IN*ANDIA DEPARTMENT OF TRANSPORTATION}$
GENERAL NOTES

These notes are for Standard Drawings E 610-PRAP-10 and E 610-PRAP-12.

1. Standard Drawings E 610-PRAP-10 and -12 are for intersection control angle 70° to 110°.
   If intersection control angle is less than 70° or greater than 110°, a special design will be required.

2. See table on Standard Drawing E 610-PRAP-94 for embankment slopes to be built on either side of the approach.

3. Cross culverts under the public road approach which cannot be located outside the right-of-way clear zone shall require an appropriate end section at each end.

4. If the centerline of the approach is paved, the transition area shall be the same section as the approach and will be included in the pay limits for HMA for Approaches.

5. The area marked □□□□ shoulder area indicates the limits where the shoulder is the same as the approach pavement.

6. If the approach is to be constructed of PCCP, the details shall be as shown elsewhere in the plans for pavement thickness, joint type, and location.

7. If the Class V or above truck count for the public road approach is greater than 50 per day, the required pavement section shall be as provided elsewhere in the plans.

8. The pavement section for the turn lane shall be as shown elsewhere in the plans.

<table>
<thead>
<tr>
<th>Design speed (m.p.h.)</th>
<th>Minimum length of turning lanes (excluding lapes)</th>
<th>Downgrade slope in %</th>
<th>Upgrade slope in %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to 2</td>
<td>2.0 to 2.5</td>
<td>3 to 3.5</td>
</tr>
<tr>
<td>40</td>
<td>450</td>
<td>355</td>
<td>255</td>
</tr>
<tr>
<td>50</td>
<td>350</td>
<td>455</td>
<td>415</td>
</tr>
<tr>
<td>60</td>
<td>250</td>
<td>600</td>
<td>555</td>
</tr>
<tr>
<td>70</td>
<td>150</td>
<td>650</td>
<td>595</td>
</tr>
<tr>
<td>80</td>
<td>80</td>
<td>710</td>
<td>650</td>
</tr>
<tr>
<td>90</td>
<td>50</td>
<td>750</td>
<td>680</td>
</tr>
</tbody>
</table>

INDIANA DEPARTMENT OF TRANSPORTATION
PUBLIC ROAD APPROACH TYPE D
GENERAL NOTES AND TABLE A
SEPTEMBER 2007

STANDARD DRAWING NO. E 610-PRAP-11

[Signatures and dates]

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS SUPERVISOR

DESIGN STANDARDS SUPERVISOR
## Table of Values

<table>
<thead>
<tr>
<th>β (degrees)</th>
<th>L</th>
<th>S</th>
<th>U</th>
<th>X</th>
<th>Y</th>
<th>V</th>
<th>Chord</th>
<th>M</th>
<th>Approach Area A</th>
<th>Approach Area B</th>
<th>Auxiliary lane area C</th>
<th>Total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>111</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>112</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>113</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>114</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>115</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>116</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>117</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>118</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
<tr>
<td>119</td>
<td>108.97</td>
<td>106.57</td>
<td>104.18</td>
<td>101.79</td>
<td>99.41</td>
<td>97.02</td>
<td>25.31</td>
<td>25.45</td>
<td>25.59</td>
<td>25.73</td>
<td>25.87</td>
<td>26.01</td>
</tr>
</tbody>
</table>

### Notes
1. Use Standard Drawing E 910-PRAP-10 for public road approach type D.
GENERAL NOTES
1. Radii of 25' at minor cross streets shall be provided on new construction and on reconstruction where space permits.

2. Radii of 30' or more at major cross streets shall be provided where feasible so that a truck may turn without encroachment.

3. Radii of 40' or more at major cross streets shall be provided where trucks and buses repeatedly turn.

4. Ear construction type B permitted as shown on Standard Drawing E 605-ERCN-02.

LEGEND
A  PCCP
5  Longitudinal joint
7  Keyway joint
9  1" preformed joint filler
10  3/8" preformed joint filler
14  Integral concrete curb
15  Combined curb and gutter
20  Contraction joint

INeAN DpERAN lDEPARTMENT OF TRANSPORTATION
STREET or ALLEY APPROACH
HMA MAINLINE PAVEMENT
JANUARY 2000
STANDARD DRAWING NO. E 610–PRAP–13

/Anthony L. Ursich 1–01–00
DESIGN STANDARDS ENGINEER

/ Firooz Sandi 1–01–00
CITY ATTORNEY METROPLIS
DESIGN STANDARDS ENGINEER
GENERAL NOTES

1. Provide radii of 30° or more at major cross streets where WB-15, trucks and or buses turn repeatedly.

2. Provide radii of 60° or more at the intersection of two State or U.S. highways and streets servicing heavy industrial areas requiring repeated turns by the Indiana Single Unit Vehicle.

3. Ear construction Type B as shown on Standard Drawing E 605-ERCN-02 will be permitted.


LEGEND

A PCCP
K HMA pavement
L Longitudinal joint
M Keyway joint
B 1" Preformed joint filler
C 1/4" Preformed joint filler
D Integral concrete curb
E Combined curb and gutter
F Contraction Joint

STREET APPROACH
WITH PCCP MAINLINE APPROACH

STREET APPROACH
WITH HMA MAINLINE PAVEMENT