NOTES:
1. HIGHWAY FONT SERIES D OR APPROVED EQUIVALENT SHALL BE USED FOR NUMERALS.
2. HIGHWAY FONT SERIES C OR APPROVED EQUIVALENT SHALL BE USED FOR LETTERING. IN SOME CASES THE LETTER SERIES MAY VARY DEPENDING ON NUMBER OF LETTERS OR NUMBERS IN THE STREET NAME.
3. STROKE WIDTH OF LETTERS SHOWN ON THIS DRAWING IS FOR ILLUSTRATIVE PURPOSE ONLY AND IS NOT INTENDED TO REPRESENT CORRECT STROKE WIDTH FOR SPECIFIED LETTER SERIES OR LETTER TO LETTER SPACING.
NOTES:

1. HIGHWAY FONT SERIES D OR APPROVED EQUIVALENT SHALL BE USED FOR NUMERALS.

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NOTES:

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   NUMBERS IN THE STREET NAME.

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   AND IS NOT INTENDED TO REPRESENT CORRECT STROKE WIDTH FOR SPECIFIED LETTER
   SERIES OR LETTER TO LETTER SPACING.
PAVEMENT MARKING WORDS

**TYPICAL LETTER MEASUREMENTS**

<table>
<thead>
<tr>
<th>Letter</th>
<th>H (Height)</th>
<th>W (Width)</th>
<th>S (Stroke)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STOP</td>
<td>H = 10'</td>
<td>W = 1'-7.3&quot; TO 20'</td>
<td>S = 4.8&quot; TO 5&quot;</td>
</tr>
<tr>
<td></td>
<td>H = 8'</td>
<td>W = 1'-3.4&quot; TO 1'-4&quot;</td>
<td>S = 3.8&quot; TO 4&quot;</td>
</tr>
<tr>
<td></td>
<td>H = 4'</td>
<td>W = 7.7&quot; TO 8&quot;</td>
<td>S = 1.9&quot; TO 2&quot;</td>
</tr>
</tbody>
</table>

**GENERAL GUIDELINES FOR LETTER SIZE:**
- UTILIZE 10' LETTERS WHEN MARKING ACROSS 2 TRAFFIC Lanes
- UTILIZE 8' LETTERS WHEN MARKING ACROSS 1 TRAFFIC LANE
- UTILIZE 4' LETTERS WHEN MARKING ACROSS SIDEWALK OR BIKE LANE

**TYPICAL LETTER SPACING**

- **SCHOOL** 1-LANE SCHOOL
- **ONLY** 1-LANE ONLY
- **XING** 1-LANE XING

LETTER SPACING MAY BE INCREASED OR REDUCED ACCORDING TO WIDTH OF LANES.

- **SCHOOL** 2-LANE SCHOOL
- **XING** 2-LANE XING

WORDS SHOULD BE CENTERED WITH CONSISTENT LETTER SPACING.

**TYPICAL PAVEMENT MARKINGS**

**SHEET 1 OF 3**

**DETAIL NO. S-38**

**DATE:** JULY, 2015

**SCALE:** N.T.S.
PAVEMENT MARKING SYMBOLS

TURN ARROW

STRAIGHT ARROW

SHARKS TOOTH

HANDICAP

COMBI-ARROW

EDGE OF PAVEMENT OR LANE LINE

VARIES

8'-3"

CENTERED

VARIES

LANE LINE

LANE-REDUCTION ARROW

VARIES

20"

18'-0"

5'-9"

6'-4.5"

2'-10"

14'-3.2"

4'-4.4"

RAILROAD MARKINGS

STOP AND CROSSWALK BARS

TYPICAL PAVEMENT MARKINGS

SHEET 2 OF 3

DETAIL NO. S-38

DATE: JULY, 2015

SCALE: N.T.S.
PAVEMENT MARKING WORDS AND SYMBOLS

LEFT TURN BAY
STACKING LENGTH LESS THAN 100'

LEFT TURN BAY
STACKING LENGTH OVER 100'

NOTE
PAVEMENT WORK AND SYMBOL MARKINGS, TRANSVERSE AND LONGITUDINAL (CONTINENTAL) CROSSTRAIL LINES, AND STOP LINES WILL BE PAID FOR IN SQUARE FEET USING THEIR SPECIFIC BID ITEMS.

LEFT TURN BAY PAVEMENT MARKINGS
DETAIL NO. S-39
DATE: JULY, 2015
SCALE: N.T.S.
URBAN SINGLE–LANE ROUNDABOUT
URBAN DOUBLE–LANE ROUNDBOUGHT

ROUNDABOUT SIGNAGE & PAVEMENT MARKINGS
SHEET 2 OF 2
DETAIL NO. S-40

DATE: JULY, 2015
SCALE: N.T.S.
INCORRECT STREET LIGHT PLACEMENT

STREET LIGHTS SHALL BE PLACED ON THE DOWNSTREAM SIDE OF INTERSECTION, AS VIEWED BY A MOTORIST IN THE LANE BENEATH THE LUMINAIRE.
NOTES:
1. A NO PARKING ZONE SHALL BE IDENTIFIED WITH TWO R7-107A SIGNS, OR BY PAINTING THE CURB RED, IF NEEDED. THE R7-107A SIGNS SHALL BE PLACED AT THE BEGINNING AND THE END OF THE NO PARKING ZONE.
2. A CONCRETE PAD SHALL BE CONSTRUCTED AT THE SIGN. THE PAD SHALL BE 20’ LONG PARALLEL TO THE SIDEWALK, 11’ WIDE PERPENDICULAR TO THE SIDEWALK WITH A 6” DEPTH SLAB.

* IF THERE IS ON-STREET PARKING

STANDARD BUS STOP LOCATIONS

DETAIL NO. S-42

DATE: JULY, 2015
SCALE: N.T.S.
M.P.H.

2' MIN. LATERAL CLEARANCE BEHIND CURB AND/OR SIDEWALK

SET WITH TWO TL-3806CP DRIVE RIVETS AND WITH APPROPRIATE WASHERS

TELESPAR POST 12 GAUGE 1-3/4" X 1-3/4" X 12'

3/8" CORNER BOLT WITH 5/16" NUT (RIVET ATTACHMENT NOT ALLOWED)

2" TELESPAR ANCHOR (WHEN SET IN CONCRETE USE A 4" PVC PIPE)

6' MIN.

3' STUB

4 TO 5"

NOTES:

1. SIGN SHOULD BE SET AT AN ANGLE OF 90° AND VISIBLE TO APPROACHING TRAFFIC.
2. ALL SIGNS SHALL MEET THE MOST CURRENT MUTCD STANDARDS.

TYPICAL DIAMOND SIGN INSTALLATION

DETAIL NO. S-43

DATE: JULY, 2015

SCALE: N.T.S.
NOTES:

1. SIGN SHOULD BE SET AT AN ANGLE OF 90° INSIDE NOSE OF ISLAND AND VISIBLE TO APPROACHING TRAFFIC.

2. ALL SIGNS SHALL MEET THE MOST CURRENT MUTCD STANDARDS.
2' MIN. LATERAL CLEARANCE BEHIND CURB AND/OR SIDEWALK

7' MIN.

2" TELESPAR ANCHOR (WHEN SET IN CONCRETE USE A 4" PVC PIPE)

3/8" CORNER BOLT WITH 5/16" NUT (RIVET ATTACHMENT NOT ALLOWED)

4 TO 5"

3' STUB

SET WITH TWO TL-3806CP DRIVE RIVETS AND WITH APPROPRIATE WASHERS

TELESPAR POST 12 GAUGE 1-3/4" X 1-3/4" X 10'

NOTES:

1. SIGN SHOULD BE SET AT AN ANGLE OF NOT LESS THAN 30', OR MORE THAN 45', WITH THE LINE OF TRAFFIC FLOW TO BE VISIBLE TO APPROACHING TRAFFIC.

2. ALL SIGNS SHALL MEET THE MOST CURRENT MUTCD STANDARDS.
NOTES:
1. SIGN SHOULD BE SET AT AN ANGLE OF 90° AND BE VISIBLE TO APPROACHING TRAFFIC.
2. ALL SIGNS SHALL MEET THE MOST CURRENT MUTCD STANDARDS.
Examples:

Legend:
- R1-1: Stop Sign
- R3-2: No Left Turn Symbol
- R6-1R: One-Way Arrow Right
- OM-3L: Right Bridgeboard
- D3-1: Street/Avenue Sign
- R3-7R: Right Lane Must Turn Right
- R4-7: Keep Right of Island Symbol

Note:
This is a general layout. Signs shall be installed at exact locations per plans and with materials per standard specifications.

Typical Street Sign Placement
Detail No. S-47

Date: July, 2015
Scale: N.T.S.
FLOWLINE (TYP.)

SEE SHEET 2 FOR ISLAND DETAIL

2' PAN - SEE NOTE 3 ON SHEET 2

8" SOLID WHITE LINE FROM THE BEGINNING OF THE TAPER TO 2' FROM Curb FACE. INSTALL ONLY IF 6' CROSS PAN IS NOT NECESSARY.

Curb Ramps (4 Places)

6' PAN (TYP.)

Transition Sidewalk to Standard Street Section

Decel Lane - For Length See Table on Sheet 2

R3-7R
R1-1
R3-5R
R4-7
OM-3L
R5-1
W12-1
OM1-3

Transition Sidewalk with Stop Bar
CROSSWALK

Taper 50' Min.

NOTE:
See Sheet 2 for Notes, Decel Lane Table and Island Detail.

RIGHT IN/RIGHT OUT LAYOUT
SHEET 1 OF 2
DETAIL NO. S-48

DATE: JULY, 2015
SCALE: N.T.S.
IF CROSS PAN IS NOT NEEDED, TRANSITION FROM 12" GUTTER TO 24" GUTTER ALONG ROADWAY (TYP. BOTH ENDS)

PATH RAISED 2% MAX. FROM FLOWLINE, 5' WIDTH

2' PAN - SEE NOTE 3

VERTICAL CURB HEAD- 6" WIDTH (POUR WITH SIDEWALK)

4" THICK CONCRETE SURFACE COLOR AND STAMPED PATTERN TO BE APPROVED BY CITY.

4" PVC FOR SIGN INSTALLATION (TYP.)

R=46'

R=2' (TYP. 2 CORNERS)

CURB FLOWLINE

CURB RAMP (TYP.)

R=46'

R=20'

20:1 MAX. SLOPE ON ISLAND RAMP (TYP.)

6" VERT. FACE CURB WITH REVERSE SLOPE GUTTER (S-18)

DECEL LANE LENGTH TABLE

<table>
<thead>
<tr>
<th>POSTED MPH</th>
<th>MIN. LENGTH IN FT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>170</td>
</tr>
<tr>
<td>35/40</td>
<td>280</td>
</tr>
<tr>
<td>50</td>
<td>410</td>
</tr>
<tr>
<td>55</td>
<td>490</td>
</tr>
</tbody>
</table>

THIS TABLE LISTS THE MINIMUM LANE LENGTH, WHICH MAY NEED TO BE EXTENDED BASED ON TRAFFIC IMPACT STUDY REQUIREMENTS.

NOTE:

1. THIS IS A GENERAL LAYOUT. SIGNS SHALL BE INSTALLED AT EXACT LOCATIONS PER PLANS AND WITH MATERIALS PER STANDARD SPECIFICATIONS.

2. MEDIAN ISLAND CURB AND GUTTER TO BE CITY STANDARD 6" VERT. FACE CURB WITH REVERSE SLOPE GUTTER. THE CONTRACTOR SHALL WIDEN THE GUTTER TO 24 INCHES AND CONVERT TO IN-FLOW GUTTER ALONG MAIN ROADWAY.

3. ALL RADIUS ARE FLOWLINE OR FACE OF CURB.
STANDARD VEHICLE

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F*</th>
<th>G*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°</td>
<td>8</td>
<td>23</td>
<td>8</td>
<td>23</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>30°</td>
<td>8.5</td>
<td>20</td>
<td>17.4</td>
<td>17</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>45°</td>
<td>8.5</td>
<td>20</td>
<td>20.2</td>
<td>12</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>60°</td>
<td>9</td>
<td>19</td>
<td>21</td>
<td>10.4</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>90°</td>
<td>9</td>
<td>19</td>
<td>19</td>
<td>9</td>
<td>24</td>
<td>NA</td>
</tr>
</tbody>
</table>

COMPACT VEHICLE

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F*</th>
<th>G*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°</td>
<td>7.5</td>
<td>19</td>
<td>7.5</td>
<td>19</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>30°</td>
<td>7.5</td>
<td>16.5</td>
<td>14.8</td>
<td>15</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>45°</td>
<td>7.5</td>
<td>16.5</td>
<td>17</td>
<td>10.6</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>60°</td>
<td>8</td>
<td>16</td>
<td>17.9</td>
<td>9.2</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>90°</td>
<td>8</td>
<td>15</td>
<td>15</td>
<td>8</td>
<td>24</td>
<td>NA</td>
</tr>
</tbody>
</table>

* UNDER SPECIAL CONDITIONS, THESE DIMENSIONS COULD BE VARIED WITH THE LOCAL ENTITY'S APPROVAL.
* STALL LENGTH (ONLY) CAN BE REDUCED BY 2 FT. WHEN OVERHANGING IS PROVIDED.
* FOR HANDICAP SPACES, WIDTH SHALL BE 13 FT. WITH RAMP ACCESS TO WALKS.

A - ANGEL OF PARKING
B - STALL WIDTH
C - STALL LENGTH
D - STALL DEPTH
E - CURB LENGTH
F - TOW-WAY DRIVE WIDTH OR DOUBLE LOADED DRIVE WIDTH
G - ONE-WAY DRIVE WIDTH OR SINGLE LOADED DRIVE WIDTH

PARKING AREA DIMENSIONS

DETAIL NO. S-49

DATE: JULY, 2015
SCALE: N.T.S.
NOTE: When $V_0 < 400$ VPH (dashed line), a Left-Turn Lane is not normally warranted unless the advancing volume ($VA$) in the same direction as the Left-turning traffic exceeds 400 VPH ($VA > 400$ VPH).

NOTE:
1. Left turn lanes are required at all intersections and all-movement accesses on arterial roadways except where roundabouts are provided.
L_{db} - Length of Taper and Lane for Deceleration and Braking (ft)

Functional Basis: To provide sufficient length for a vehicle to decelerate and brake entirely outside the through traffic lanes.

Desirable Design: Deceleration in gear for 3 seconds (occurs over bay taper) followed by comfortable braking to a stopped position.

Minimum Design: Braking begins at 2/3 full lane width, with minimum 50-foot storage. For low speeds only, the following values apply:

\[
\begin{array}{|c|ccc|}
\hline
\text{Speed} (\text{mph}) & \text{Total} & \text{Lane} & \text{Taper} \\
\hline
30 & 230 & 50 & (180) \\
35 & 250 & 70 & (180) \\
40 & 280 & 100 & (180) \\
45 & 320 & 140 & (180) \\
\hline
\end{array}
\]

L_s - Length of Lane for Storage (Full Width Lane)

Functional Basis: To provide sufficient length for a reasonable number of vehicles to queue within the lane without affecting other lanes.

Desirable Design: Based on twice the mean arrival rate (per cycle for signals, per 2-minute period for stop control) during the peak hour of traffic.

Minimum Design: Based on the mean arrival rate, with minimum storage for one vehicle.

\[
\begin{array}{|c|c|}
\hline
\text{DHV (vph)} & \text{L_s (ft)} \\
\hline
\leq 60 & 50 - 75 \\
61 - 120 & 100 \\
121 - 180 & 150 \\
> 180 & 200 or more \\
\hline
\end{array}
\]
Approach Taper Design (ft) (Redirect Taper)

Functional Basis: To provide a smooth lateral transition for all vehicles approaching the intersection.

Form of Alignment: Tangent

Low Speed Design: (<45) Provide a fully shadowed lane.

\[ T_a = \frac{ws^2}{60} \]

\[ W = \text{Width of offset (ft)} \]
\[ S = \text{Speed (mph)} \]

High Speed Design: (≥45) Provide a fully shadowed lane.

Minimum Design: Taper ratios of 8:1 can be used for tangent bay tapers in constrained locations.

Taper Bay Design (ft)

Functional Basis: To direct left-turning vehicles into the turn lane

Form of Alignment: Tangent; or reverse curves with 1/3 of the total length comprised of a central tangent.

Desirable Design: For fully shadowed left turn lane.

\[ T_b = \frac{w_1s}{3} \]

\[ W_1 = \text{Width of lane (ft)} \]
\[ S = \text{Speed (mph)} \]

Typical Values for \( T_a \):

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>W—Width of Offset (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>115 120 125</td>
</tr>
<tr>
<td>30</td>
<td>165 170 180</td>
</tr>
<tr>
<td>35</td>
<td>225 235 245</td>
</tr>
<tr>
<td>40</td>
<td>295 305 320</td>
</tr>
</tbody>
</table>

* Rounded to nearest 5 ft.

Typical Values for \( T_b \):

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>W—Width of Offset (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>110 120</td>
</tr>
<tr>
<td>40</td>
<td>145 160</td>
</tr>
<tr>
<td>50</td>
<td>185 200</td>
</tr>
</tbody>
</table>

* Rounded to nearest 5 ft.
2-Lane Collectors or Arterials

<table>
<thead>
<tr>
<th>Right Turns in Peak Hour (vph)</th>
<th>100</th>
<th>80</th>
<th>60</th>
<th>40</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
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<td>300</td>
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<td>400</td>
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<td>500</td>
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<td>600</td>
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<tr>
<td>700</td>
<td></td>
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</tr>
</tbody>
</table>

Total Peak Hour Volume on Approach Leg (vph)

4-Lane Arterials

<table>
<thead>
<tr>
<th>Right Turns in Peak Hour (vph)</th>
<th>100</th>
<th>80</th>
<th>60</th>
<th>40</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td></td>
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<tr>
<td>600</td>
<td></td>
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<tr>
<td>800</td>
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<tr>
<td>1000</td>
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<tr>
<td>1200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1400</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Total Peak Hour Volume on Approach Leg (vph)

NOTE:
1. Right turn lanes are required on 6-lane arterial when the right turn volume exceeds 200 vph.
**L_{d/b} - Length of Taper and Lane for Deceleration and Braking (ft)**

**Functional Basis:** To provide sufficient length for a vehicle to decelerate and brake entirely outside the through traffic lanes.

**Desirable Design:** Deceleration in gear for 3 seconds (occurs over bay taper) followed by comfortable braking to a stopped position or to the design speed of the corner radius.

\[
T_b = \frac{W_1 S}{3}
\]

**Bay Taper Length**  
\[
T_b = \frac{W_1 S}{3}
\]

**T_{b} - Bay Taper Design**

**Functional Basis:** To direct right-turning vehicles into the turn lane.

**Form of Alignment:** Tangent; or reverse curves with 1/3 of the total length comprised of a central tangent.

**Desirable Design:** For fully shadowed right turn lane.

\[
T_b = \frac{W_1 S}{3}
\]

\[W_1 = \text{Width of Lane} \]
\[S = \text{Speed (mph)}\]

**L_s - Length of lane for Storage (Full Lane Width) (ft)**

**Functional Basis:** To provide sufficient length for a reasonable number of vehicles to queue within the lane without affecting other lanes.

**Desirable Design:** Based on twice the mean arrival rate (per cycle for signals, per 2-minute period for stop control) during the peak hour of traffic.

**Minimum Design:** Based upon the mean arrival rate, with minimum storage for one vehicle.

**Typical Values for T_{b}**

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>W - Width of Offset (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>110 120</td>
</tr>
<tr>
<td>40</td>
<td>145 160</td>
</tr>
<tr>
<td>50</td>
<td>185 200</td>
</tr>
</tbody>
</table>

*Rounded to nearest 5 ft.*

Minimum Design: Taper ratios of 8:1 can be used for tangent bay tapers in constrained locations.

**L_s for Stop Control**

<table>
<thead>
<tr>
<th>DHV (vph)</th>
<th>L_s (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤60</td>
<td>50–75</td>
</tr>
<tr>
<td>61–120</td>
<td>100</td>
</tr>
<tr>
<td>121–180</td>
<td>150</td>
</tr>
<tr>
<td>&gt;180</td>
<td>200 or more</td>
</tr>
</tbody>
</table>

Reference NCHRP 279