

6th St 4000 →

← 4000 6th St

26th Ave 2000 →

← 2000 26th Ave

40th Ave Ct 2000 →

← 2000 40th Ave Ct

Buena Vista Rd 2000 →

← 2000 Buena Vista Rd

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.



STREET NAME SIGN LAYOUT  
D3

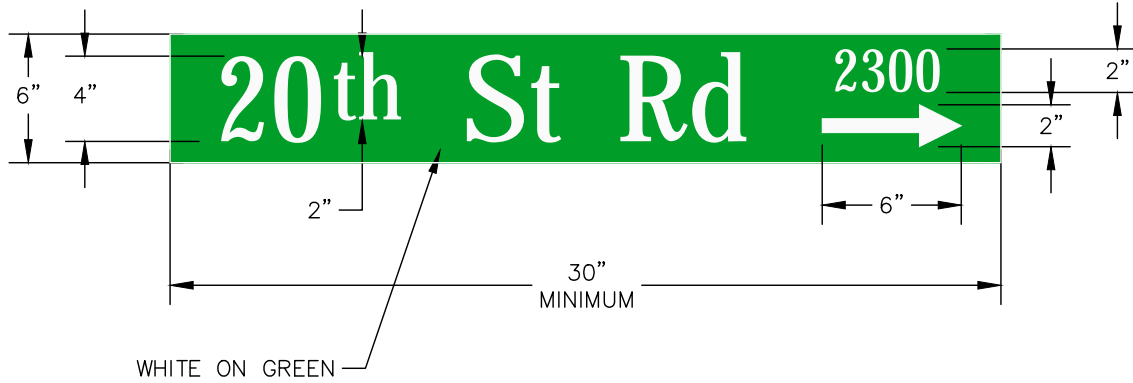
DETAIL NO. S-35

DATE: JULY, 2015

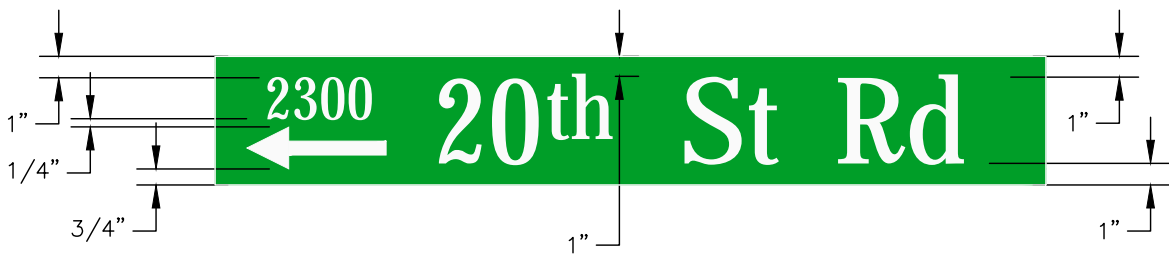
SCALE: N.T.S.



FRONT VIEW



REAR VIEW



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.



STREET NAME SIGN

D3

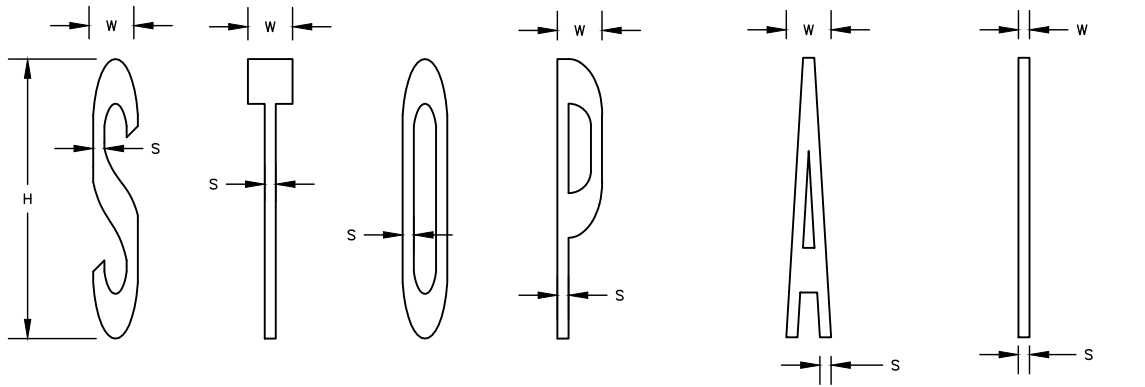
DETAIL NO. S-37

DATE: JULY, 2015

SCALE: N.T.S.

# PAVEMENT MARKING WORDS

## TYPICAL LETTER MEASUREMENTS



W = S  
FOR THE  
LETTER I  
ONLY

H = HEIGHT

H = 10'

H = 8'

H = 4'

W = WIDTH

W = 1'-7.3" TO 20'

W = 1'-3.4" TO 1'-4"

W = 7.7" TO 8"

S = STROKE

S = 4.8' TO 5'

S = 3.8" TO 4"

S = 1.9" TO 2"

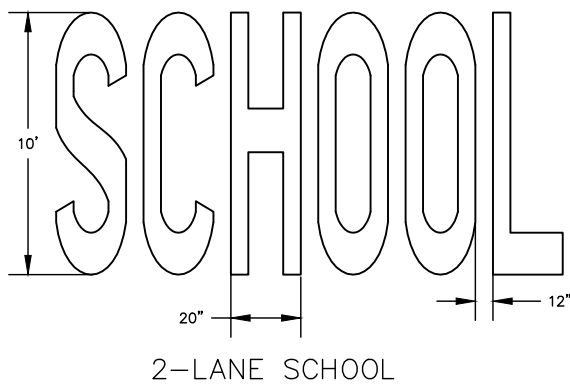
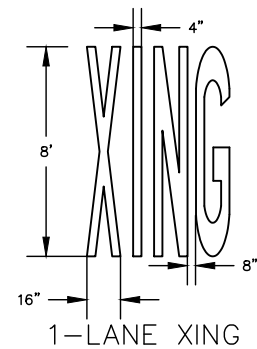
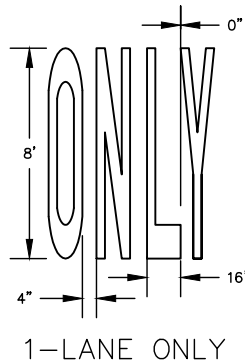
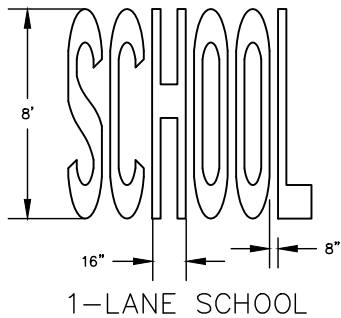
GENERAL  
GUIDELINES FOR  
LETTER SIZE:

UTILIZE 10'  
LETTERS WHEN  
MARKING ACROSS  
2 TRAFFIC LANES

UTILIZE 8'  
LETTERS  
WHEN MARKING  
ACROSS 1 TRAFFIC  
LANE

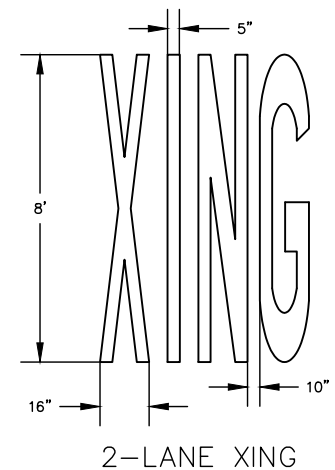
UTILIZE 4'  
LETTERS  
WHEN MARKING  
ACROSS SIDEWALK  
OR BIKE LANE

## TYPICAL LETTER SPACING



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

WORDS SHOULD BE  
CENTERED WITH  
CONSISTENT LETTER  
SPACING.



## TYPICAL PAVEMENT MARKINGS

SHEET 1 OF 3

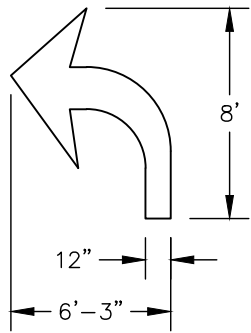
DETAIL NO. S-38

DATE: JULY, 2015

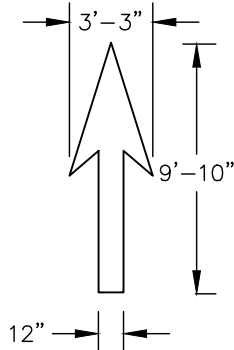
SCALE: N.T.S.

# PAVEMENT MARKING SYMBOLS

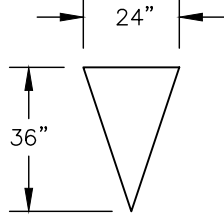
## TURN ARROW



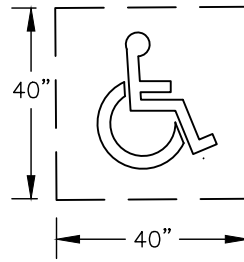
## STRAIGHT ARROW



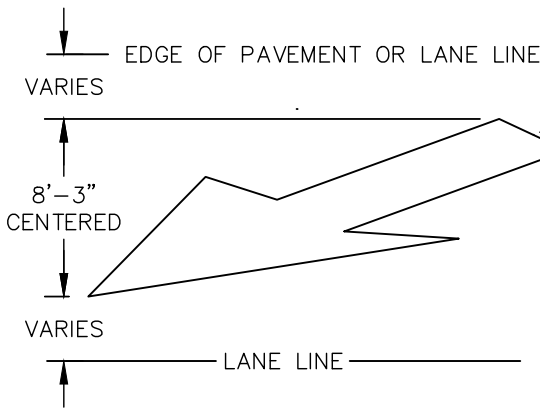
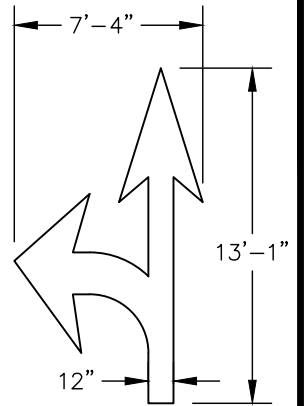
## SHARKS TOOTH



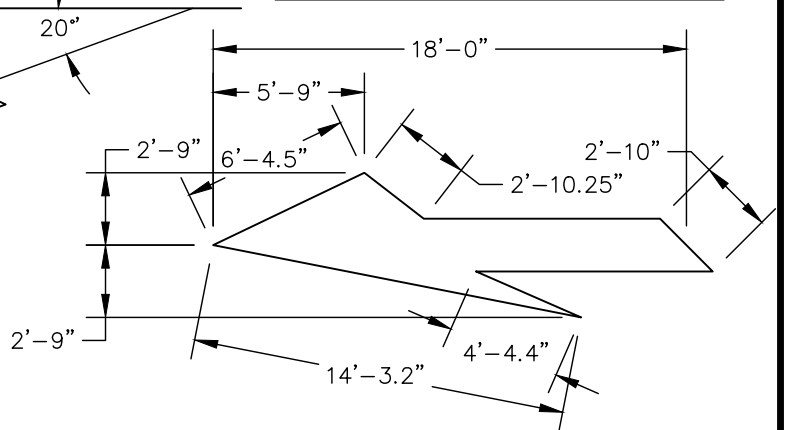
## HANDICAP



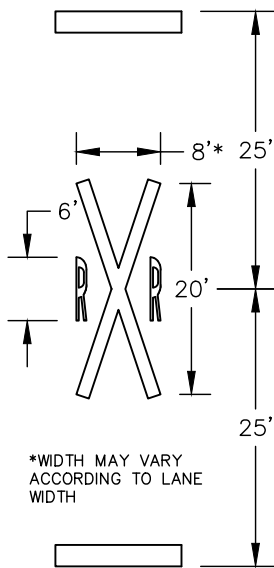
## COMBI-ARROW



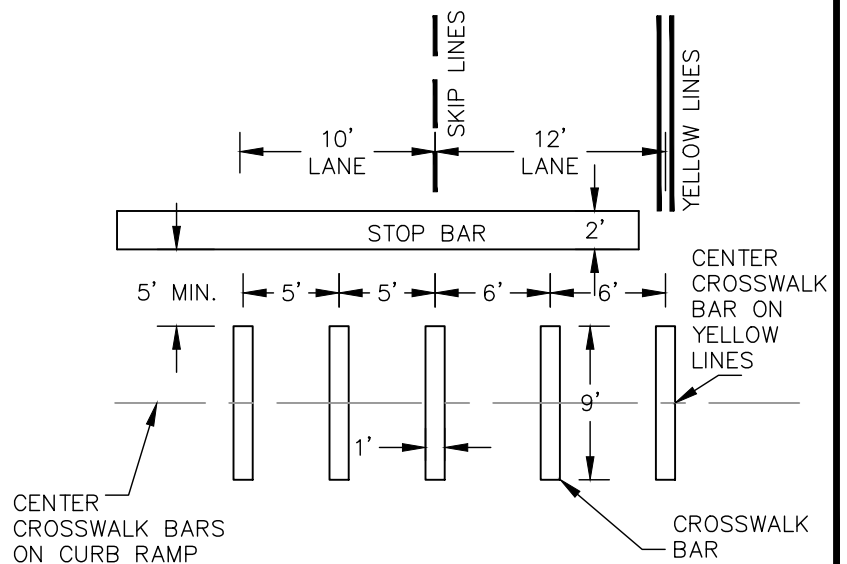
## LANE-REDUCTION ARROW



## RAILROAD MARKINGS



## STOP AND CROSSWALK BARS



## TYPICAL PAVEMENT MARKINGS

SHEET 2 OF 3

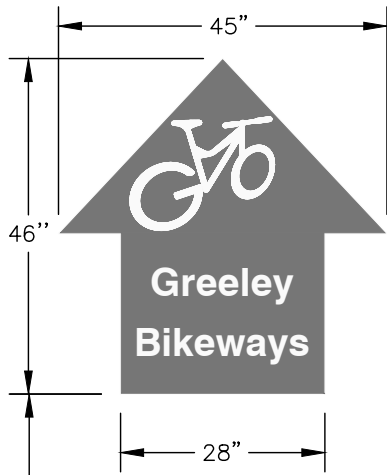
DETAIL NO. S-38

DATE: JULY, 2015

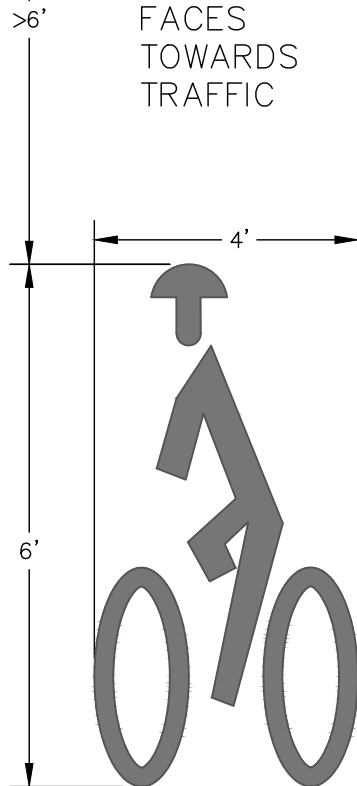
SCALE: N.T.S.

# BICYCLE PAVEMENT MARKINGS

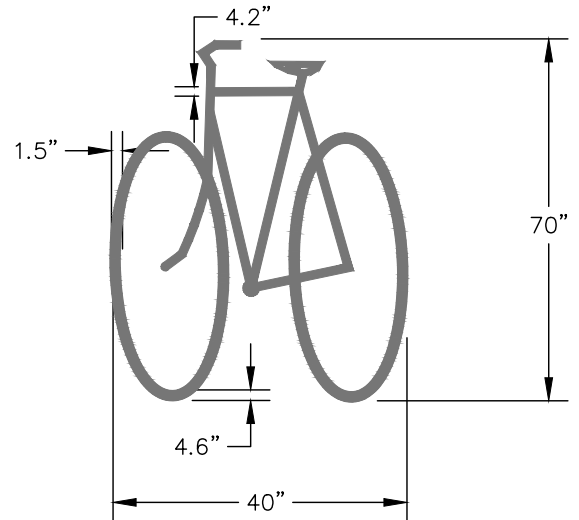
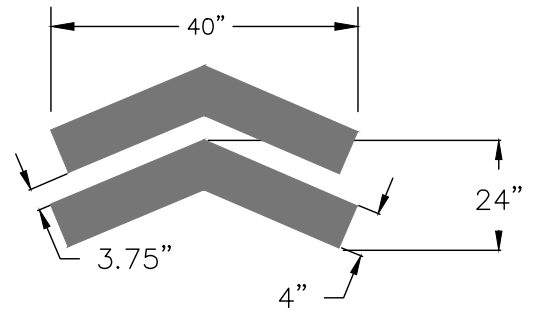
## BIKE LANE



BIKE RIDER  
FACES  
TOWARDS  
TRAFFIC



## SHARE THE LANE



TYPICAL PAVEMENT MARKINGS

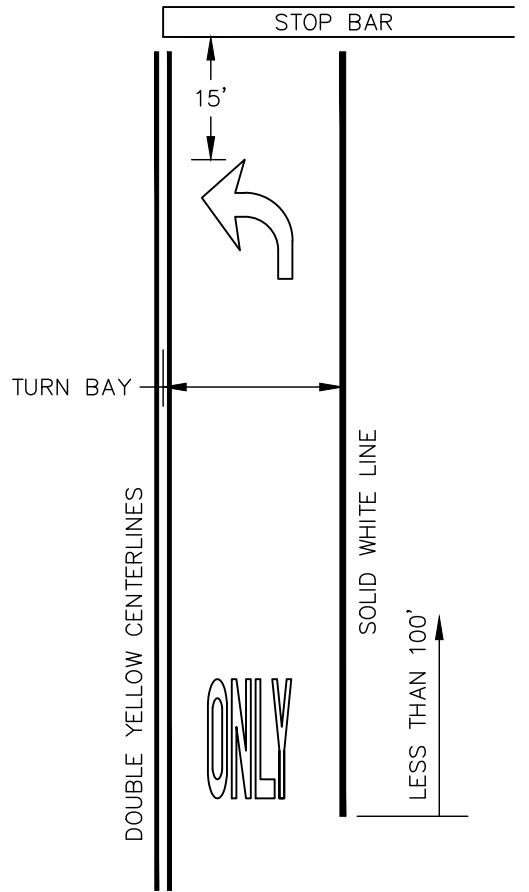
SHEET 3 OF 3

DETAIL NO. S-38

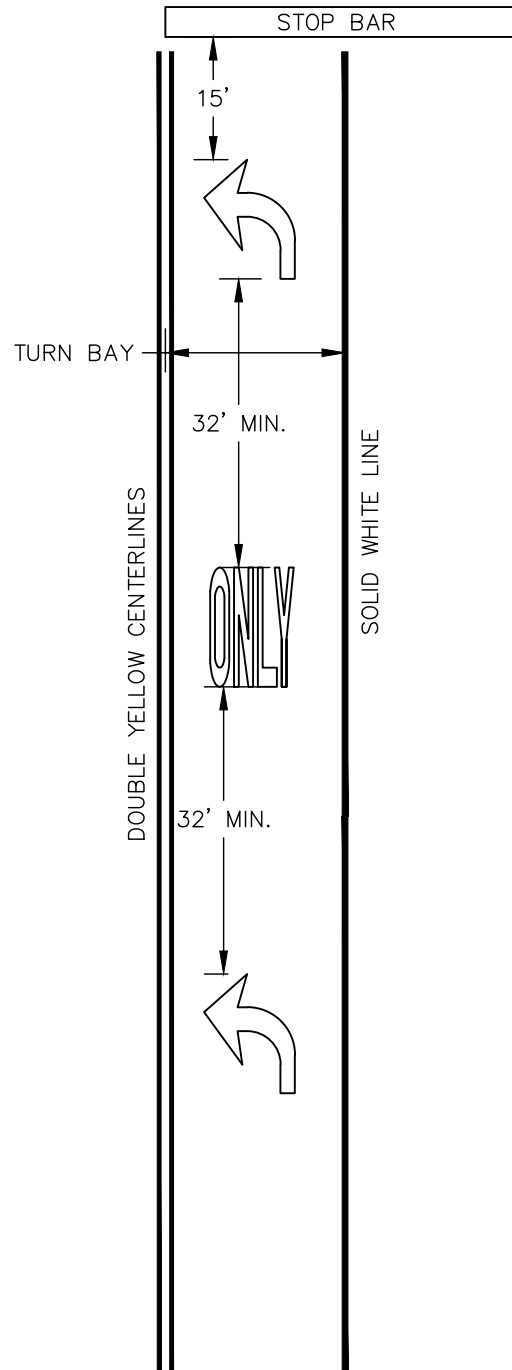
DATE: JULY, 2015

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) CROSSWALK LINES, AND STOP LINES WILL BE PAID FOR IN SQUARE FEET USING THEIR SPECIFIC BID ITEMS.

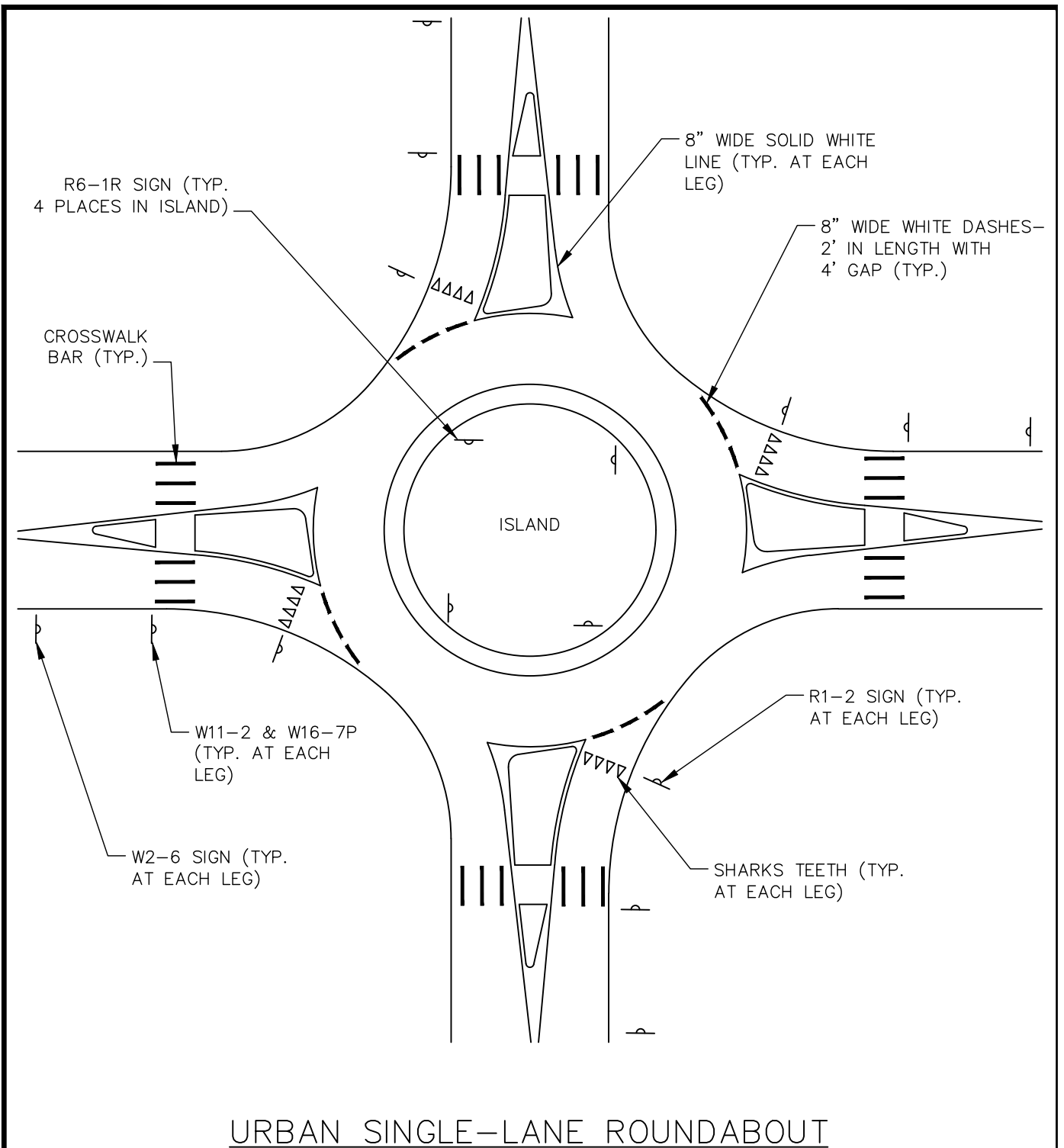


## LEFT TURN BAY PAVEMENT MARKINGS

DETAIL NO. S-39

DATE: JULY, 2015

SCALE: N.T.S.



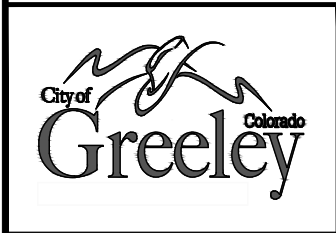
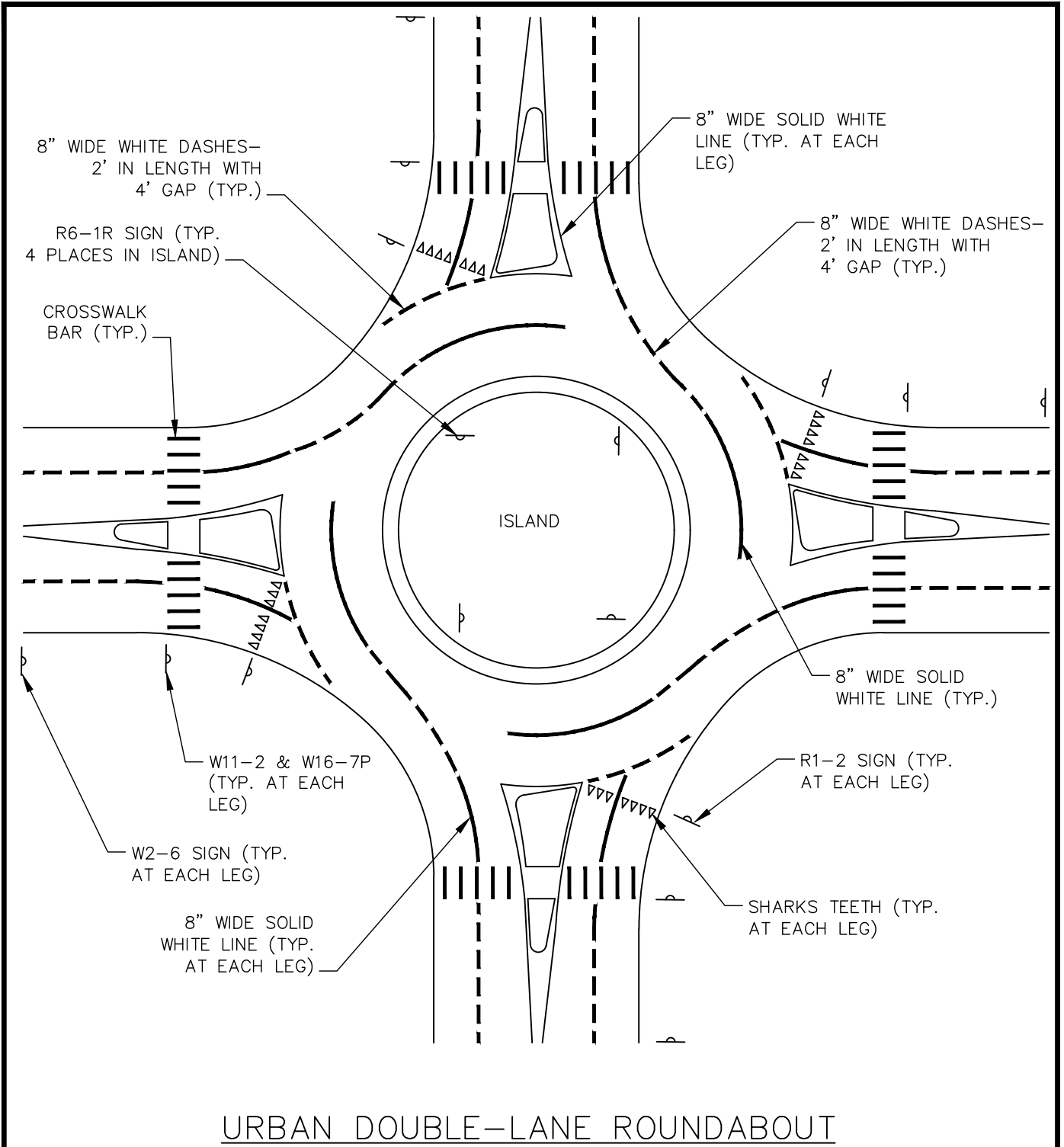
ROUNDABOUT SIGNAGE & PAVEMENT MARKINGS  
SHEET 1 OF 2

DETAIL NO. S-40

DATE: JULY, 2015

SCALE: N.T.S.

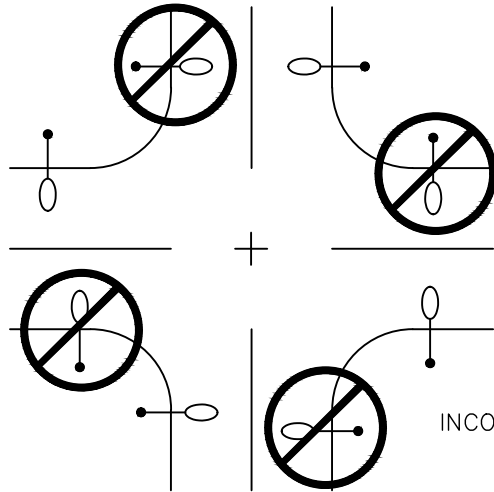




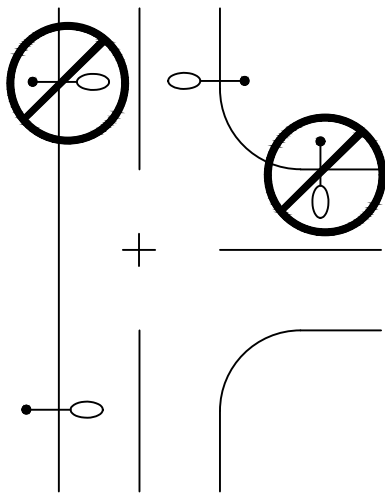
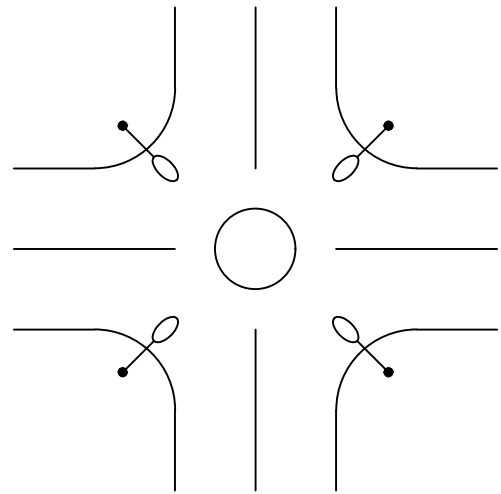
ROUNDABOUT SIGNAGE & PAVEMENT MARKINGS  
SHEET 2 OF 2  
DETAIL NO. S-40

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.

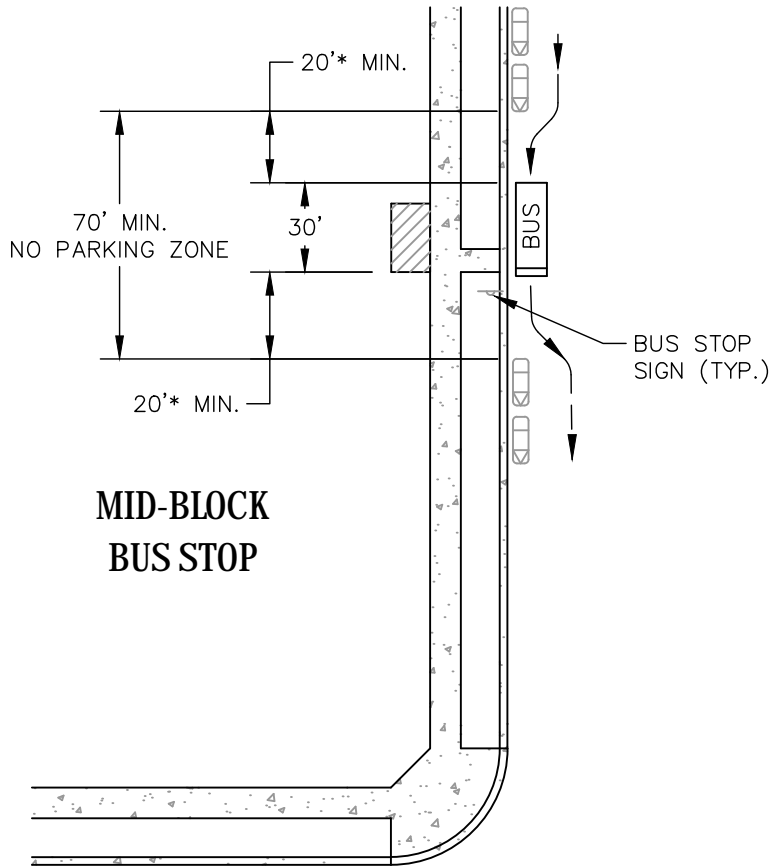


STREET LIGHT PLACEMENT AT INTERSECTIONS

DETAIL NO. S-41

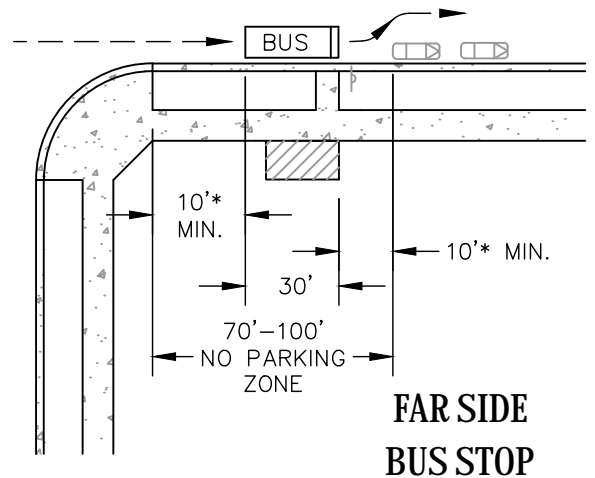
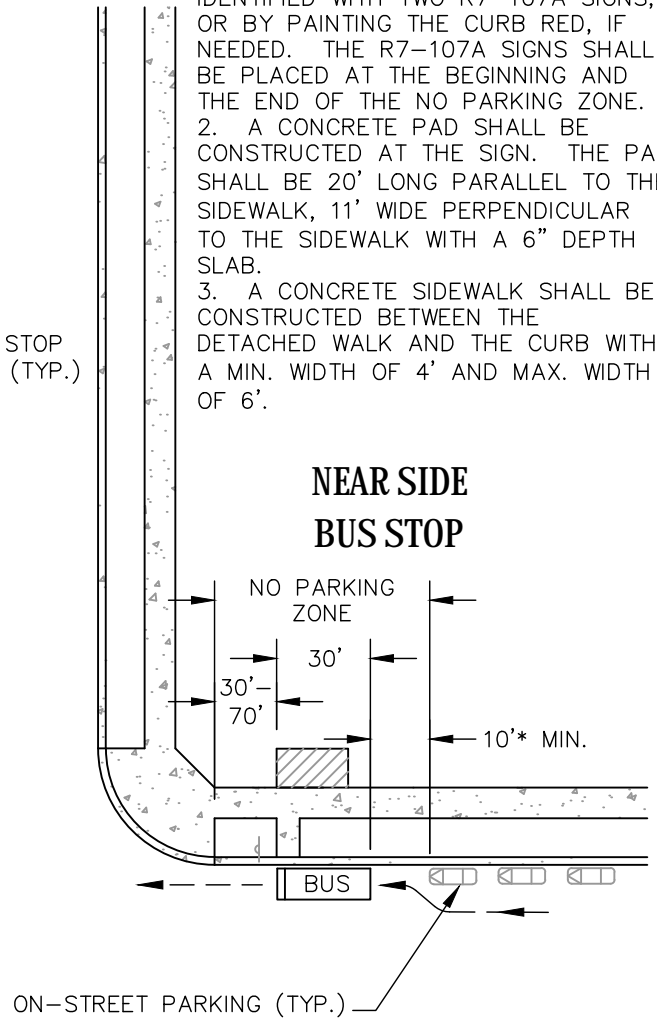
DATE: JULY, 2015

SCALE: N.T.S.



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.
3. A CONCRETE SIDEWALK SHALL BE CONSTRUCTED BETWEEN THE DETACHED WALK AND THE CURB WITH A MIN. WIDTH OF 4' AND MAX. WIDTH OF 6'.

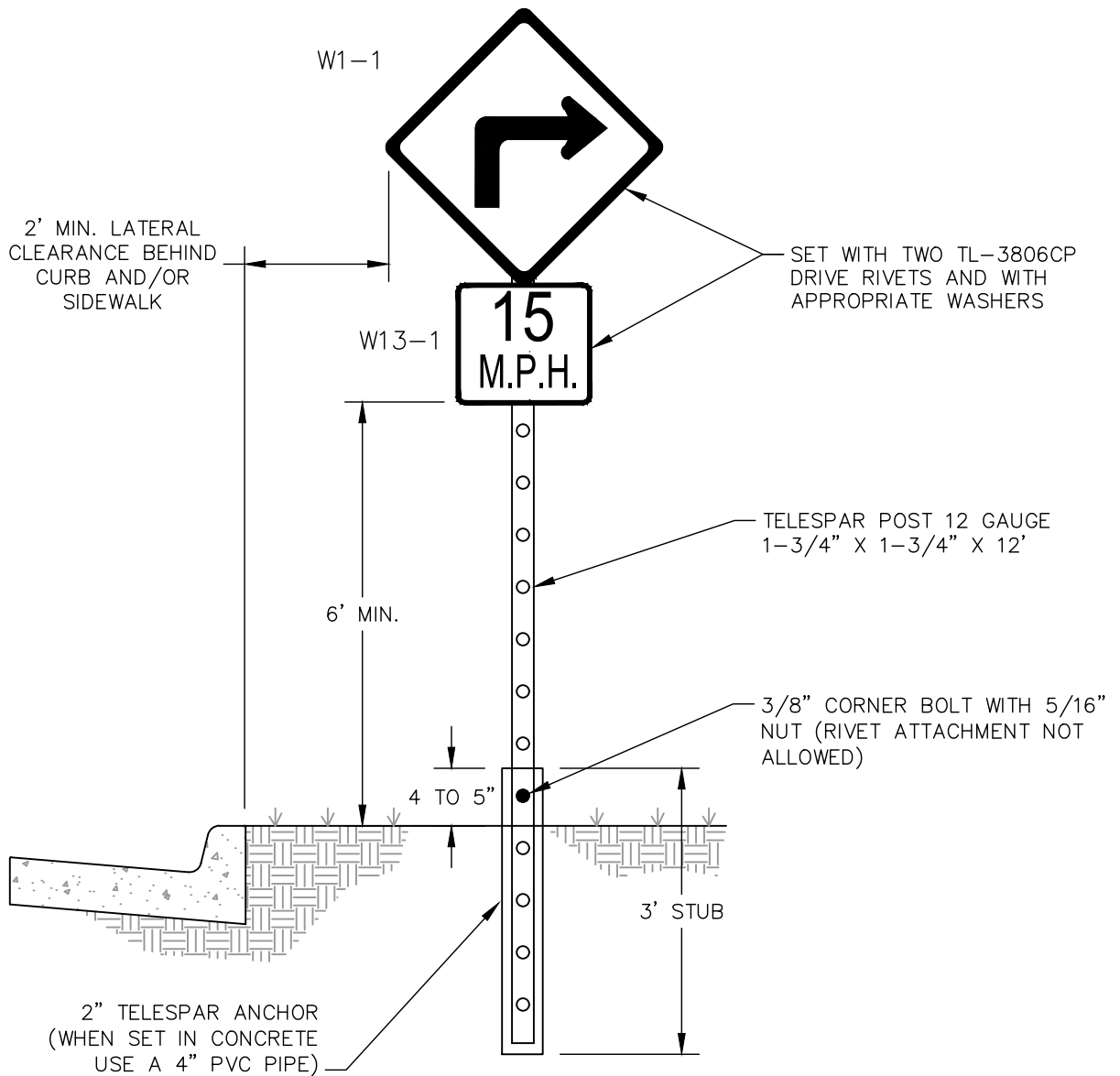


STANDARD BUS STOP LOCATIONS

DETAIL NO. S-42

DATE: JULY, 2015

SCALE: N.T.S.



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.

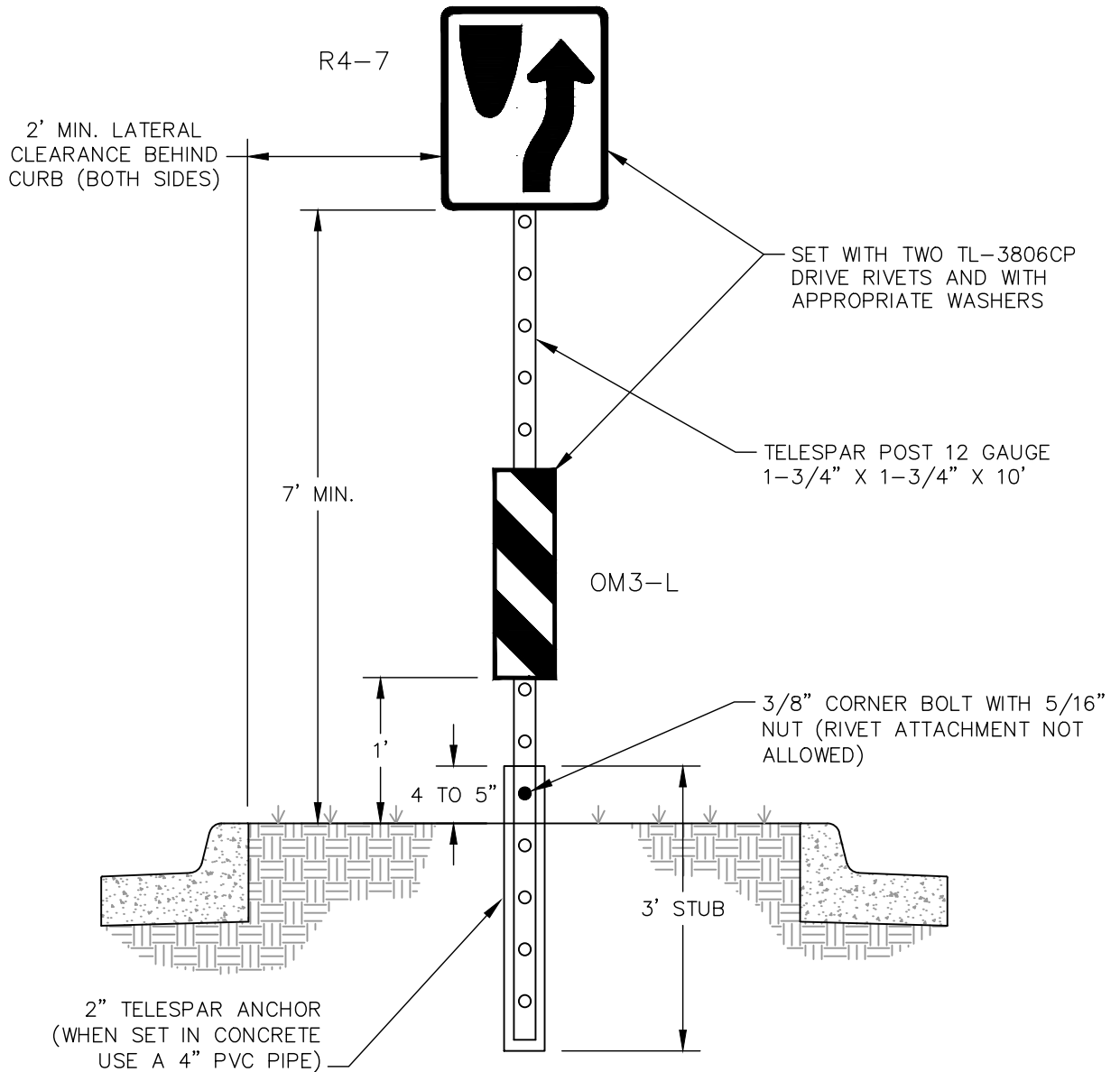


TYPICAL DIAMOND SIGN INSTALLATION

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.

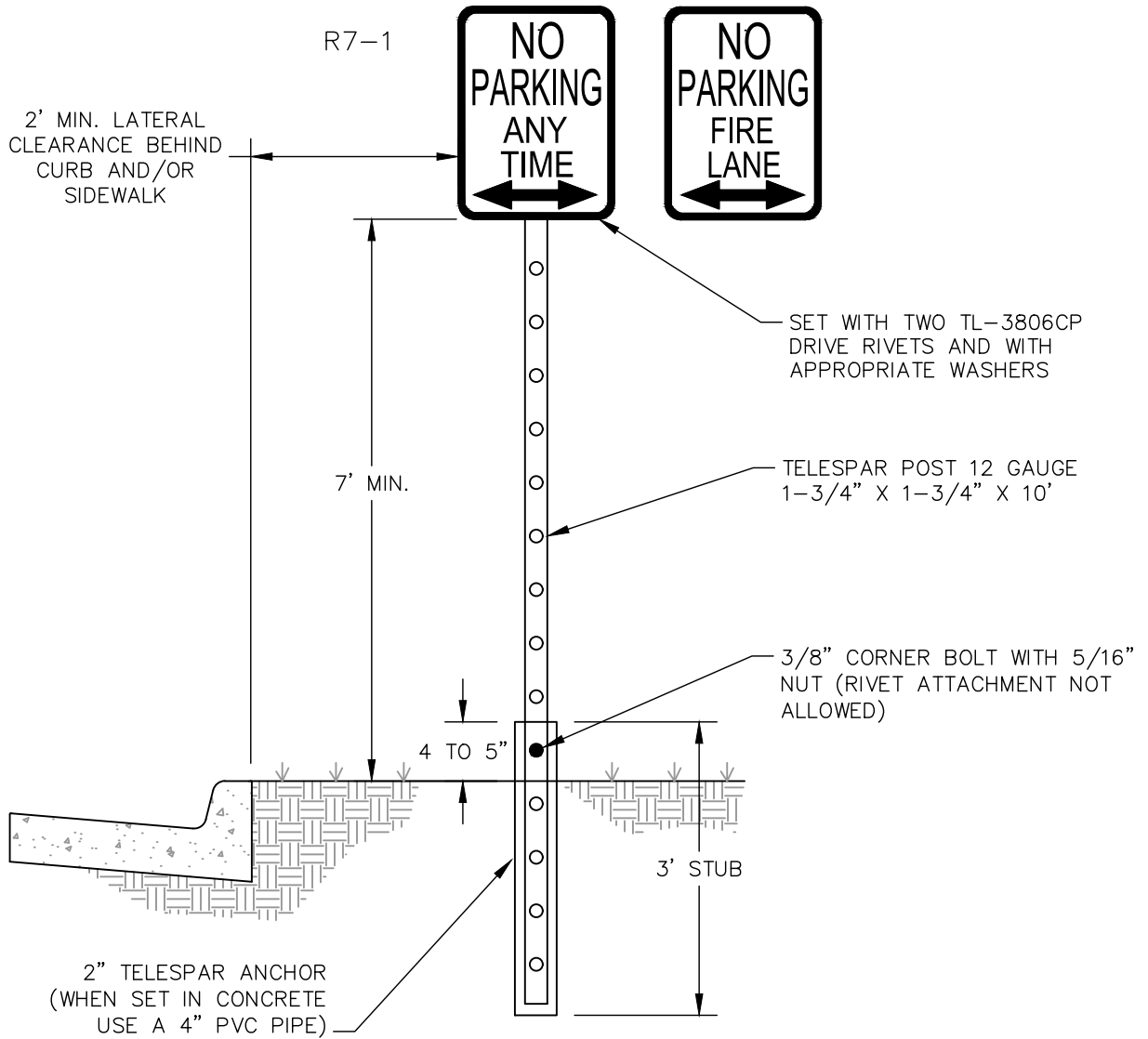


TYPICAL ISLAND SIGN INSTALLATION

DETAIL NO. S-44

DATE: JULY, 2015

SCALE: N.T.S.



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.

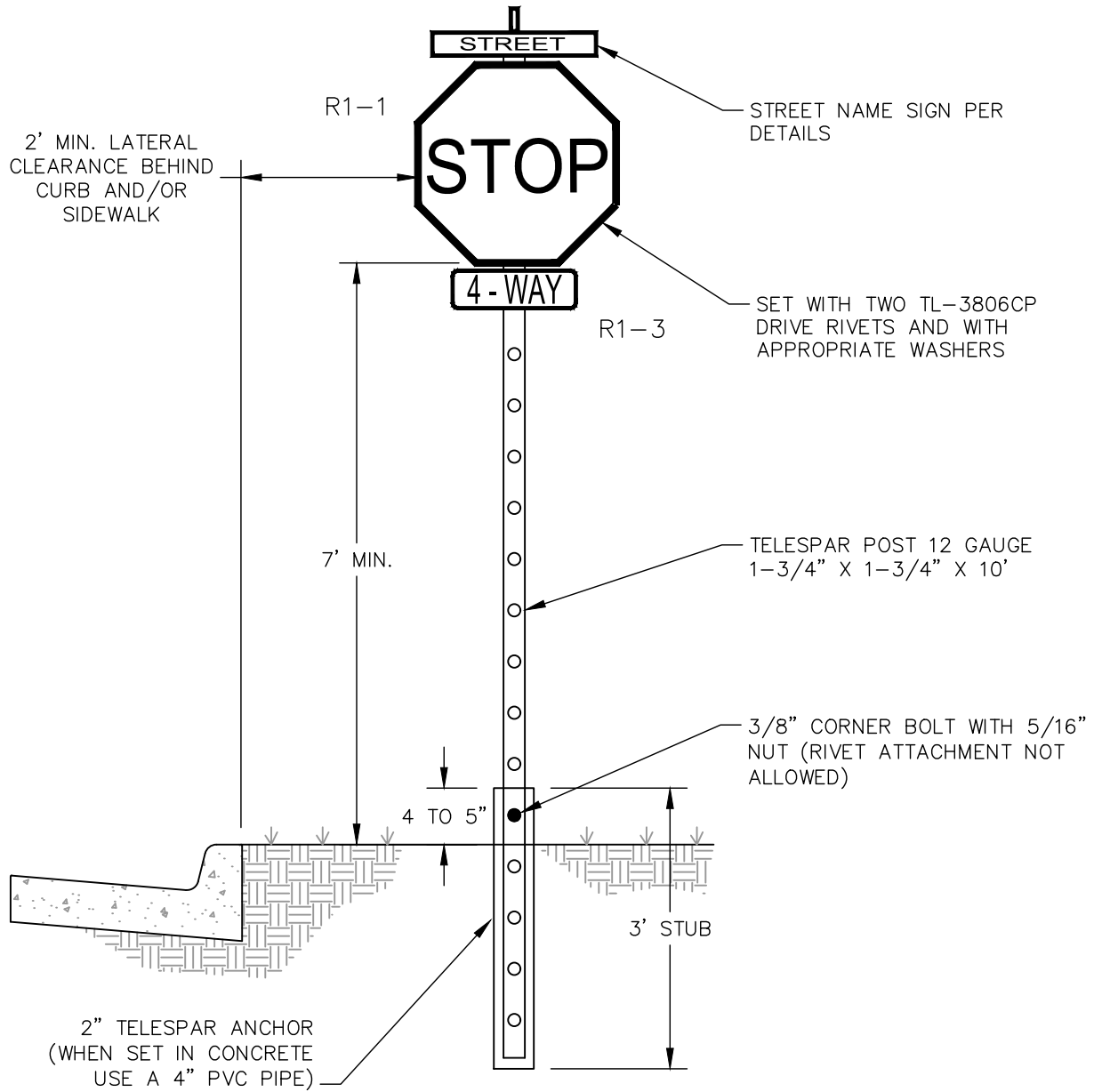


TYPICAL NO PARKING SIGN INSTALLATION

DETAIL NO. S-45

DATE: JULY, 2015

SCALE: N.T.S.



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.

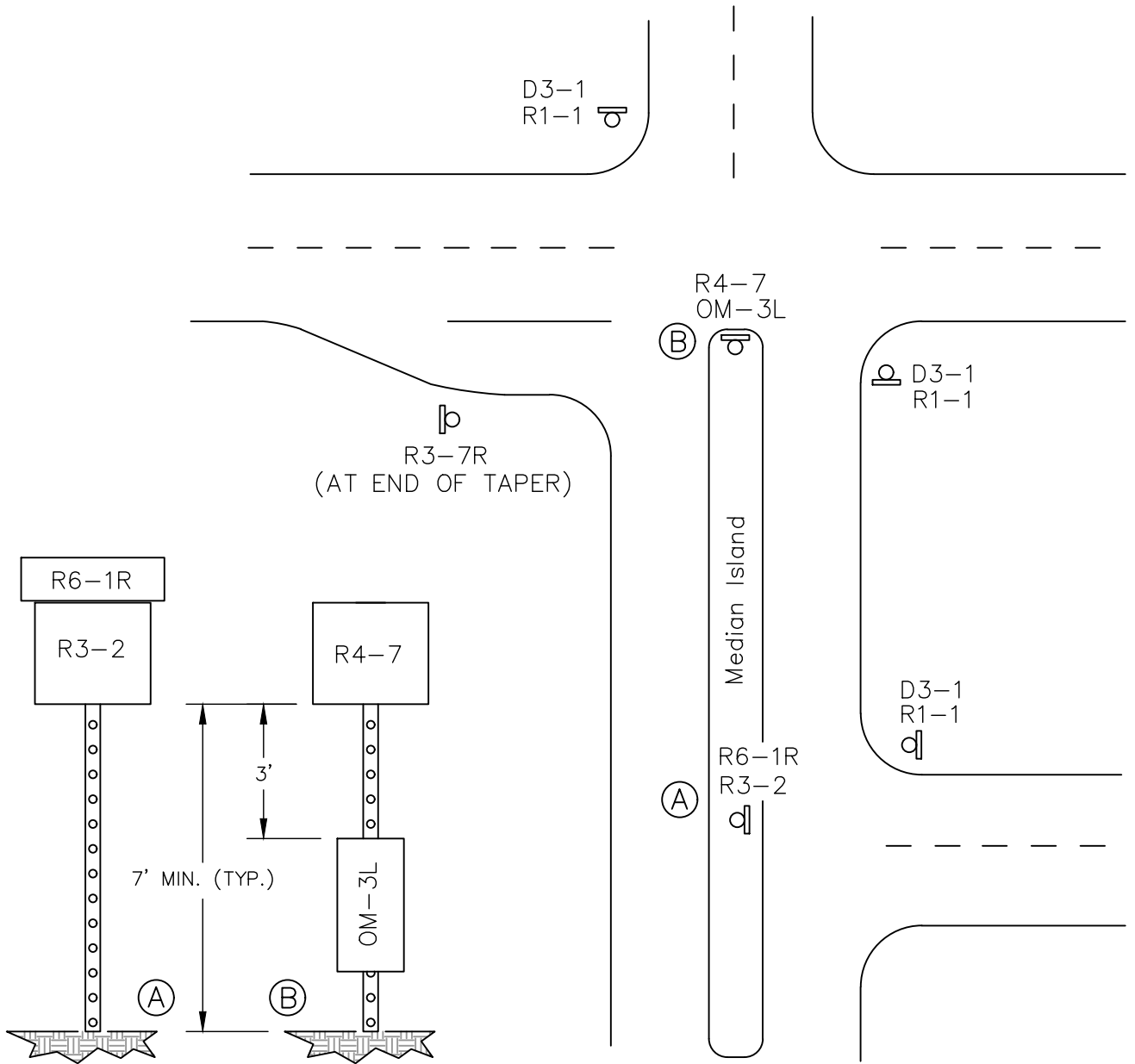


TYPICAL STOP SIGN INSTALLATION

DETAIL NO. S-46

DATE: JULY, 2015

SCALE: N.T.S.



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..



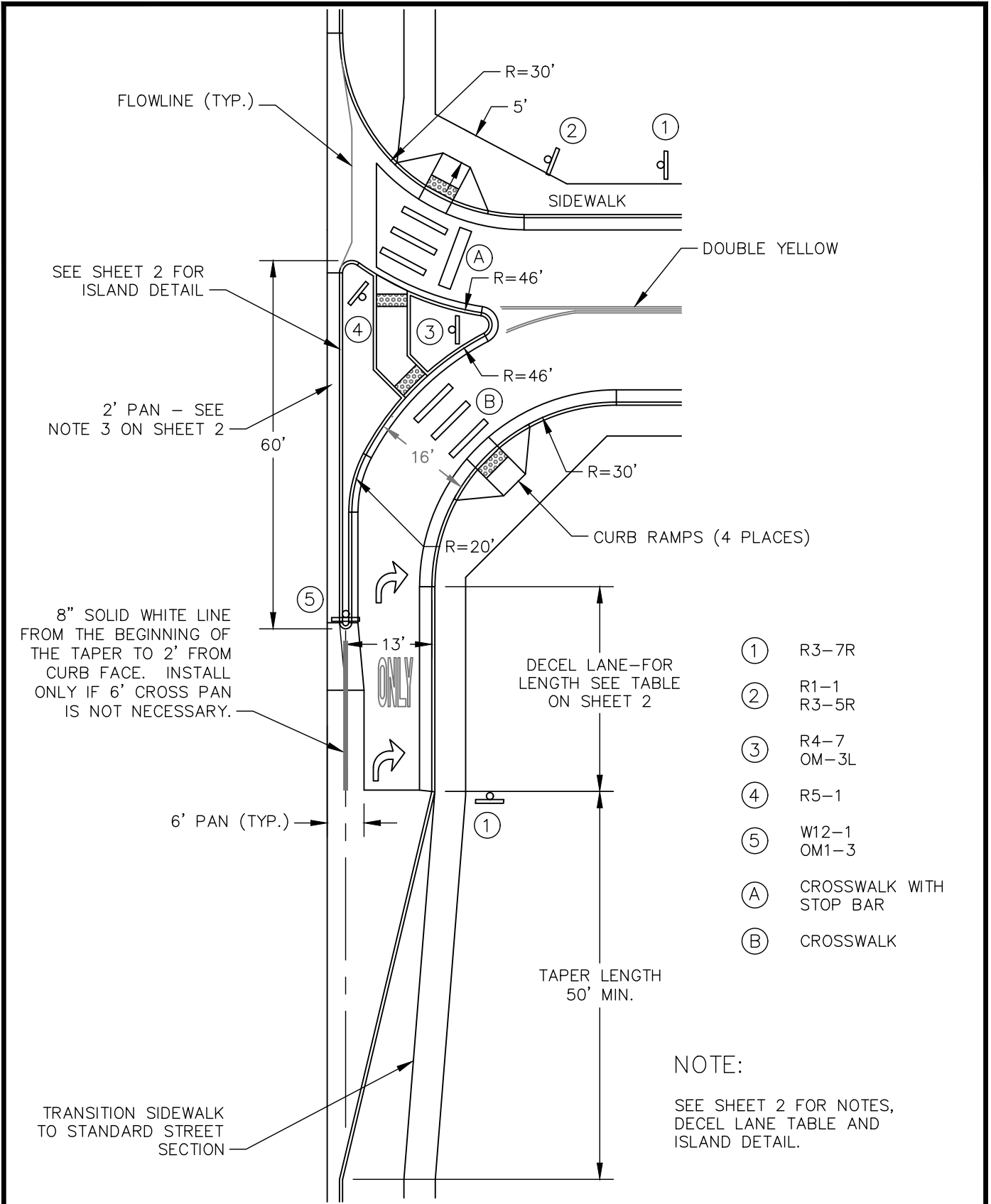
TYPICAL STREET SIGN PLACEMENT

DETAIL NO. S-47

DATE: JULY, 2015

SCALE: N.T.S.



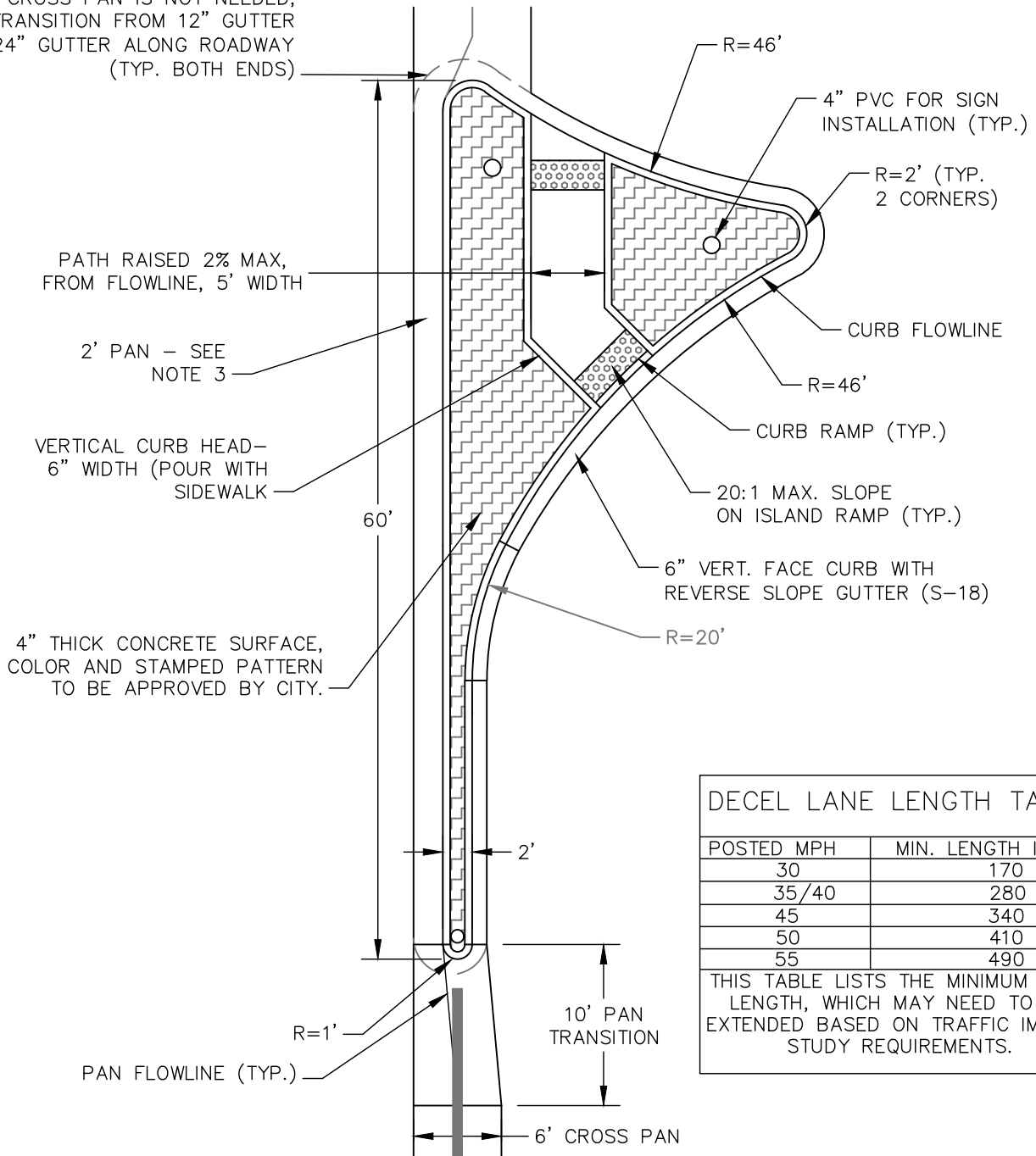


RIGHT IN/RIGHT OUT LAYOUT  
SHEET 1 OF 2  
DETAIL NO. S-48

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)



DECEL LANE LENGTH TABLE

POSTED MPH	MIN. LENGTH IN FT.
30	170
35/40	280
45	340
50	410
55	490

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

NOTES:

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 RADII ARE FLOWLINE OR FACE OF CURB.



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

DATE: APRIL, 2016

SCALE: N.T.S.

### STANDARD VEHICLE

Dimension in feet

A	B <sup>①</sup>	C <sup>②</sup>	D	E	F*	G*
0°	8	23	8	23	20	12
30°	8.5	20	17.4	17	20	15
45°	8.5	20	20.2	12	20	15
60°	9	19	21	10.4	24	20
90°	9	19	19	9	24	NA

### COMPACT VEHICLE

Dimension in feet

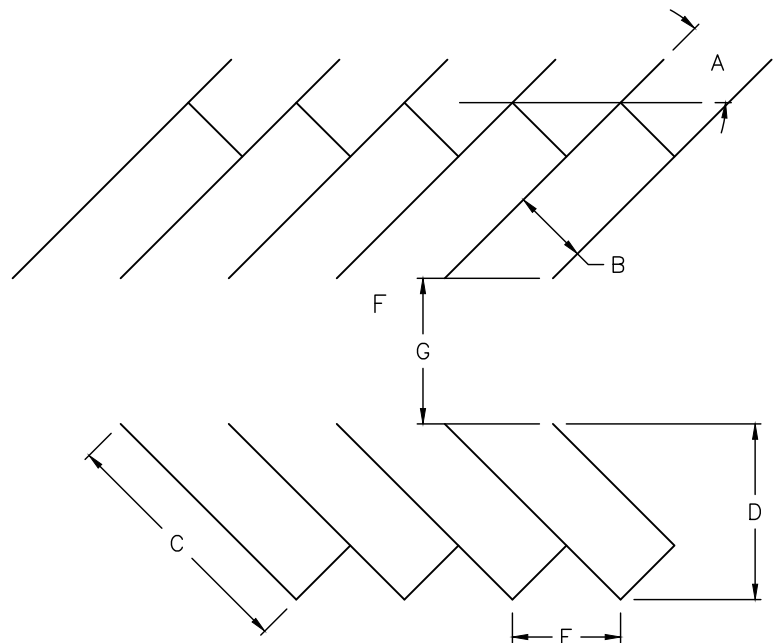
A	B	C	D	E	F*	G*
0°	7.5	19	7.5	19	20	12
30°	7.5	16.5	14.8	15	20	15
45°	7.5	16.5	17	10.6	20	15
60°	8	16	17.9	9.2	24	20
90°	8	15	15	8	24	NA

\* UNDER SPECIAL CONDITIONS, THESE DIMENSIONS COULD BE VARIED WITH THE LOCAL ENTITY'S APPROVAL.

① STALL LENGTH (ONLY) CAN BE REDUCED BY 2 FT. WHEN OVERHANGING IS PROVIDED.

② 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



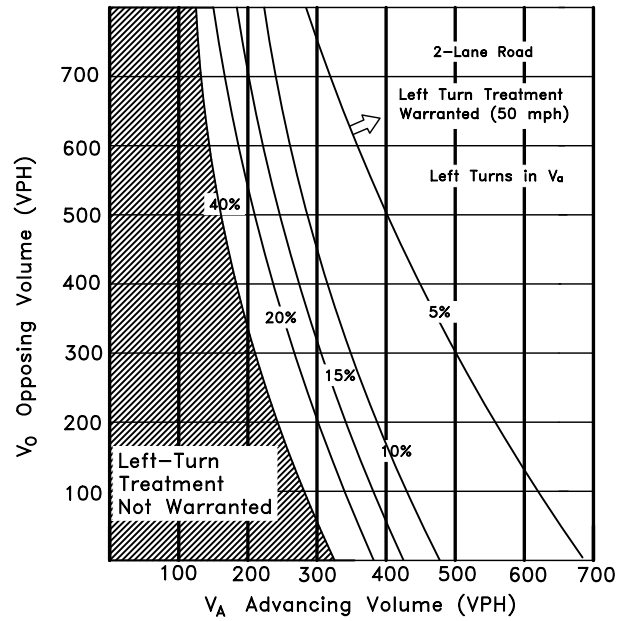
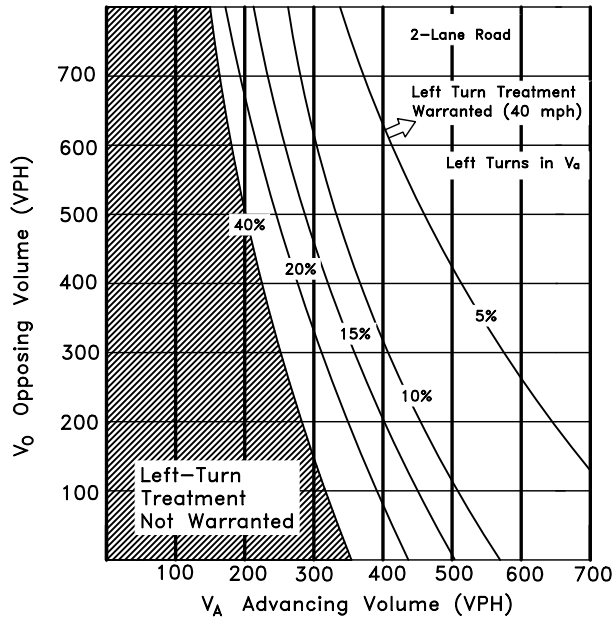
## PARKING AREA DIMENSIONS

DETAIL NO. S-49

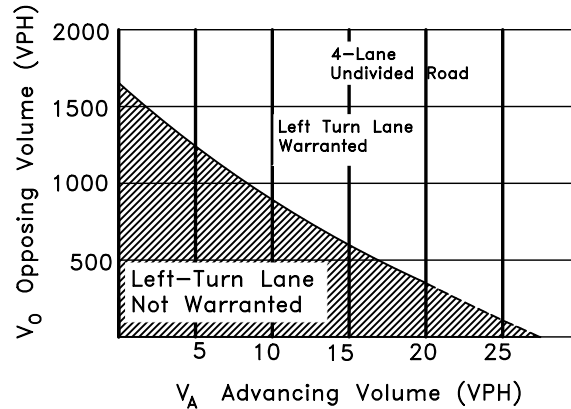
DATE: JULY, 2015

SCALE: N.T.S.

# VOLUME WARRANTS FOR LEFT TURN LANES



NOTE: When  $V_0 < 400$  VPH (dashed line), a Left-Turn Lane is not normally warranted unless the advancing volume ( $V_A$ ) in the same direction as the Left-turning traffic exceeds 400 VPH ( $V_A > 400$  VPH).



NOTE:

1. Left turn lanes are required at all intersections and all-movement accesses on arterial roadways except where roundabouts are provided.



LEFT TURN LANE DESIGN GUIDELINES  
SHEET 1 OF 3  
DETAIL NO. S-50

DATE: JULY, 2015

SCALE: N.T.S.

$L_{d/b}$  - 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.

Design Values for  $L_{d/b}$

S-- Speed (mph)	Length (ft)		
	Total	Lane	Bay Taper
30	235	115	(120)
40	315	155	(160)
50	435	235	(200)
60	530	290	(240)

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

Design Values for  $L_{d/b}$

S-- Speed (mph)	Length (ft)		
	Total	Lane	Bay Taper
30	230	50	(180)
35	250	70	(180)
40	280	100	(180)
45	320	140	(180)

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

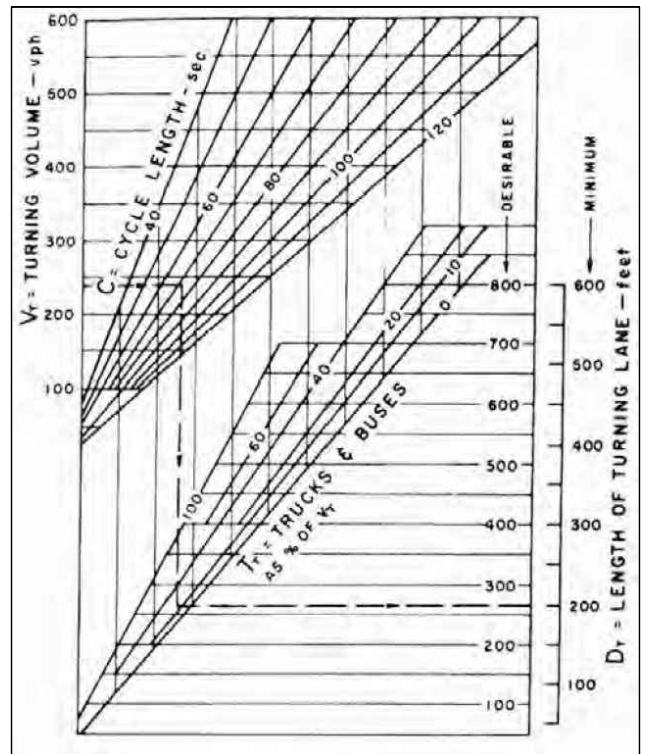
**Functional Basis:** To provide sufficient length for a reasonable number of vehicles to queue within the lane without affecting other lanes.

**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.

$L_s$  for Stop Control

DHV (vph)	$L_s$ (ft)
$\leq 60$	50-75
61-120	100
121-180	150
$> 180$	200 or more



LEFT TURN LANE DESIGN GUIDELINES  
SHEET 2 OF 3  
DETAIL NO. S-50

DATE: JULY, 2015

SCALE: N.T.S.

**T<sub>a</sub>- 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 = Width of offset (ft)

S = Speed (mph)

Typical Values for T<sub>a</sub>\*

S— Speed (mph)	W—Width of Offset (ft)		
	11	11.5	12
25	115	120	125
30	165	170	180
35	225	235	245
40	295	305	320

\*Rounded to nearest 5 ft.

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

$$T_a = WS$$

W = Width of offset (ft)

S = Speed (mph)

S— Speed (mph)	W—Width of Offset (ft)		
	11	11.5	12
45	495	520	540
50	550	575	600

\*Rounded to nearest 5 ft.

**T<sub>b</sub>- 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.

$$T_b = \frac{W_1 S}{3}$$

W<sub>1</sub> = Width of lane (ft)

S = Speed (mph)

Typical Values for T<sub>b</sub>\*

S— Speed (mph)	W—Width of Offset (ft)	
	11	12
30	110	120
40	145	160
50	185	200

\*Rounded to nearest 5 ft.

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

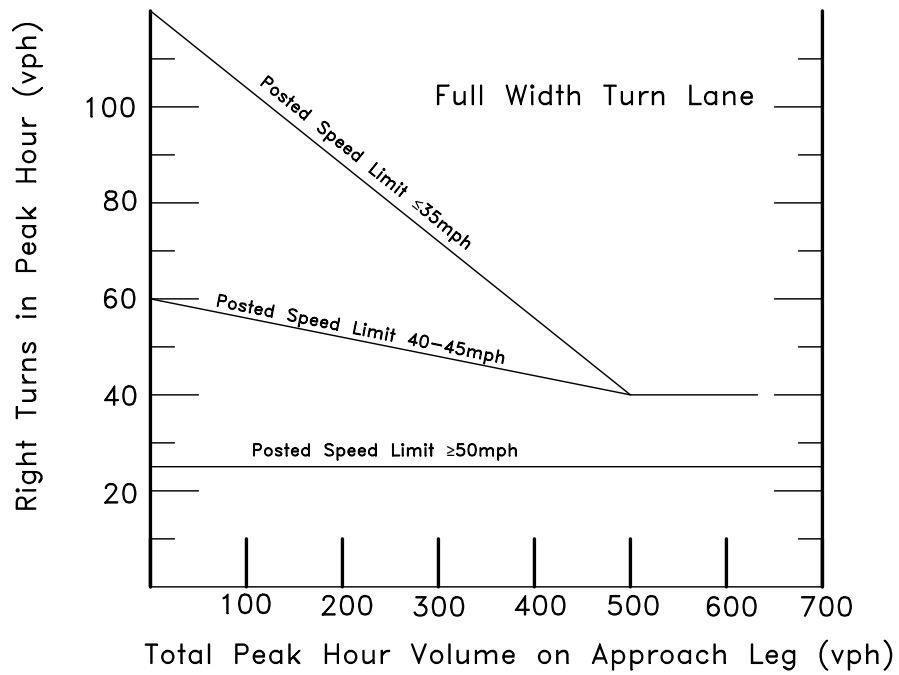


LEFT TURN LANE DESIGN GUIDELINES  
SHEET 3 OF 3  
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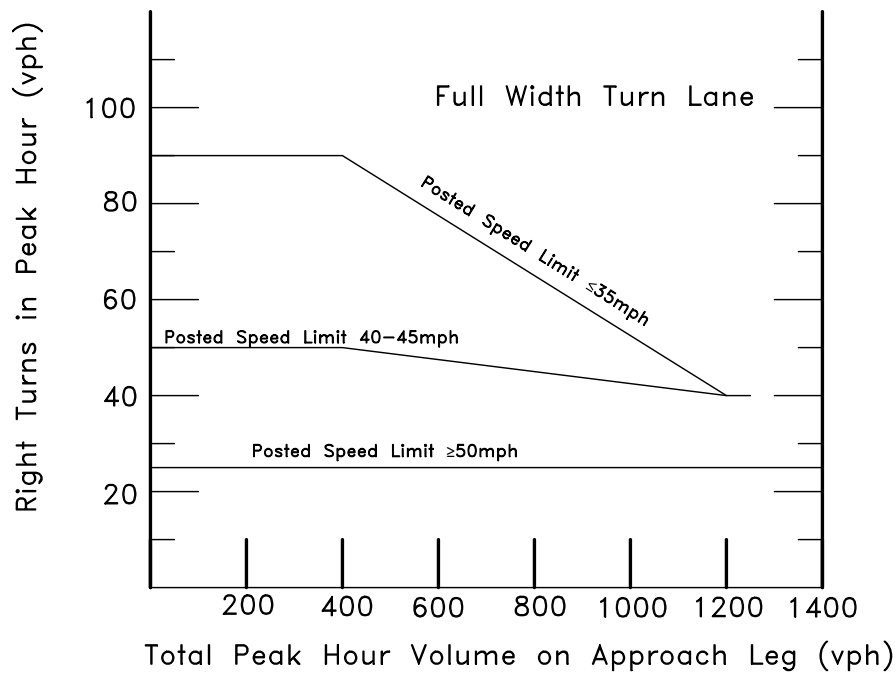
DATE: JULY, 2015

SCALE: N.T.S.

## 2-Lane Collectors or Arterials



## 4-Lane Arterials



NOTE:

1. Right turn lanes are required on 6-lane arterial when the right turn volume exceeds 200 vph.



### RIGHT TURN LANE DESIGN GUIDELINES

SHEET 1 OF 2

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$L_d/b$  - 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.

$$\text{Bay Taper Length} = \frac{WS}{3}$$

$$T_b = \frac{W_1 S}{3}$$

Design Values for  $L_d/b$

Highway Design Speed, V (mph)	*Stop Condition	Design Speed of Corner Radius (mph)			
		15	20	25	30
30	235	185	160	140	—
35	275	240	213	188	93
40	315	295	265	235	185
45	375	350	325	295	250
50	435	405	385	355	315

\*Appropriate for right turn lanes in approaches to stop signs and traffic signals.

$T_b$ - 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.

$$T_b = \frac{W_1 S}{3}$$

$W_1$  = Width of Lane

S = Speed (mph)

Typical Values for  $T_b$ \*

S— Speed (mph)	W—Width of Offset (ft)	
	11	12
30	110	120
40	145	160
50	185	200

\*Rounded to nearest 5 ft.

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

$L_s$  - 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.

$L_s$  for Stop Control

DHV (vph)	$L_s$ (ft)
≤60	50–75
61–120	100
121–180	150
>180	200 or more

Reference NCHRP 279



RIGHT TURN LANE DESIGN GUIDELINES  
SHEET 2 OF 2

DETAIL NO. S-51

DATE: JULY, 2015

SCALE: N.T.S.