



**KURSUS REKABENTUK PERABOT JALAN
(TANDAAN JALAN DAN PAPAN TANDA JALAN)**

**HANDS-ON
REKABENTUK PAPAN TANDA TUNJUK ARAH**

Tarikh : 31 Mac 2021 (Rabu)
Masa : 11.00 pagi

DISEDIAKAN OLEH:

NURUL AIDA BT JASNI
SERI ASHIKIN BT SOFIAN



1

**REKABENTUK
PAPARAN
PAPAN
TANDA
TUNJUK ARAH**

RECAP : KRITERIA REKABENTUK ASAS

PAPANTANDA DESTINASI



PAPANTANDA ARAH



PAPANTANDA JARAK



Table 2.1: Colour of Traffic Signs

WARNA

	TYPES OF TRAFFIC SIGNS	LETTERING/ SYMBOL & BORDER	BACKGROUND	REMARK
I	REGULATORY SIGNS	AS SHOWN IN ARAHAN TEKNIK (JALAN) 2A/85		
II	WARNING SIGNS	AS SHOWN IN ARAHAN TEKNIK (JALAN) 2A/85		
III	TEMPORARY SIGNS	AS SHOWN IN ARAHAN TEKNIK (JALAN) 2C/85		
IV	GUIDE SIGNS			
	a. Destination Signs	WHITE	BLUE	Except on LLM expressways which should be white letters / border on green background.
	b. Directional Signs	WHITE	BLUE	Those leading to roads within local council i.e. local streets should have yellow letters for street name.
		WHITE	GREEN	Those leading to or/and on LLM Expressways.
	c. Distance Signs	WHITE	BLUE	Except an LLM expressways (white on green)
	d. Information Signs:			
	i. General Services	WHITE	BLUE	
	ii. Recreational/Historical & Cultural Areas/Places of Interest	WHITE	BROWN	
	iii. Major Housing Estates	BLUE	WHITE	
V	iv. River Names	GREEN	WHITE	
	v. Towns / Village Names	BLACK	WHITE	
	vi. Government Buildings	YELLOW	GREEN	
	vii. Government Related Premises	GREEN	WHITE	
	e. Route Number Markers	BLACK	FLUORESCENT YELLOW	
	f. Kilometre Posts	AS SHOWN IN ARAHAN TEKNIK (JALAN) 9/86		
	OTHER TRAFFIC SIGNS			
	a. Gantry Signs	WHITE	BLUE	Applies to all roads except LLM expressways. Local streets should have yellow letters for the street name.

Table 2.2: Types and Sizes of Letterings on Traffic Signs

JENIS, SAIZ HURUF & GARISAN TEPI

	TYPES OF TRAFFIC SIGNS	TYPE OF LETTERING	LETTER HEIGHT (mm)	TYPE OF BORDER	REMARK
I	REGULATORY SIGNS	AS SHOWN IN ARAHAN TEKNIK (JALAN) 2A/85 AND SEE ALSO APPENDIX F			
II	WARNING SIGNS				
III	TEMPORARY SIGNS	AS SHOWN IN ARAHAN TEKNIK (JALAN) 2C/85			
IV	GUIDE SIGNS	Transport Heavy	Refer to Table 2.3	White and set-in	Use Letter Mosaics
	a. Destination Signs				
	b. Directional Signs				
	c. Distance Signs		150	White and extended	
	d. Information Signs				
	i. General Services		Refer to Table 2.3, Figure 3.15 & 3.16	White and set-in	
	ii. Recreational/ Historical & Cultural Areas/Places of Interest				
	iii. Major Housing Estates		Refer to Table 2.3, Figure 3.17	Blue and set-in	
	iv. River Names		100 Refer to Figure 3.17	Green and set-in	
	v. Town/Village Names		300 Refer to Figure 3.18	Black and set-in	
	vi. Government Buildings		Refer to Table 2.3, Figure 3.19	Yellow and set-in	
	vii. Government Related Premises		Refer to Table 2.3, Figure 3.19	Green and set-in	
	e. Route Number Markers	Refer to Table 3.2	Refer to Table 3.2, Figure 3.11	Black and extended	
f. Kilometre Posts	AS SHOWN IN ARAHAN TEKNIK (JALAN) 9/86				
V	OTHER TRAFFIC SIGNS	Transport Heavy	Refer to Table 2.3, Figure 3.4	White and set-in	Use Letter Mosaics
a. Gantry Signs					

TINGGI HURUF

Table 2.3: Letter Height Categories

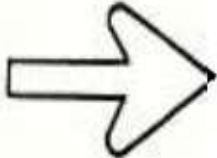
SPEED LIMIT (km/h)	SINGLE CARRIAGEWAY LETTER HEIGHT, H (mm)	MULTIPLE CARRIAGEWAY/GANTRY LETTER HEIGHT, H (mm)
Speed limit > 90 km/h	400	400
80 km/h < Speed limit ≤ 90 km/h	250	300
60km/h < Speed limit ≤ 80km/h	200	250
Speed limit ≤ 60km/h	150	200

NOTES:

Multiple carriageways shall consist of more than one lane per direction.

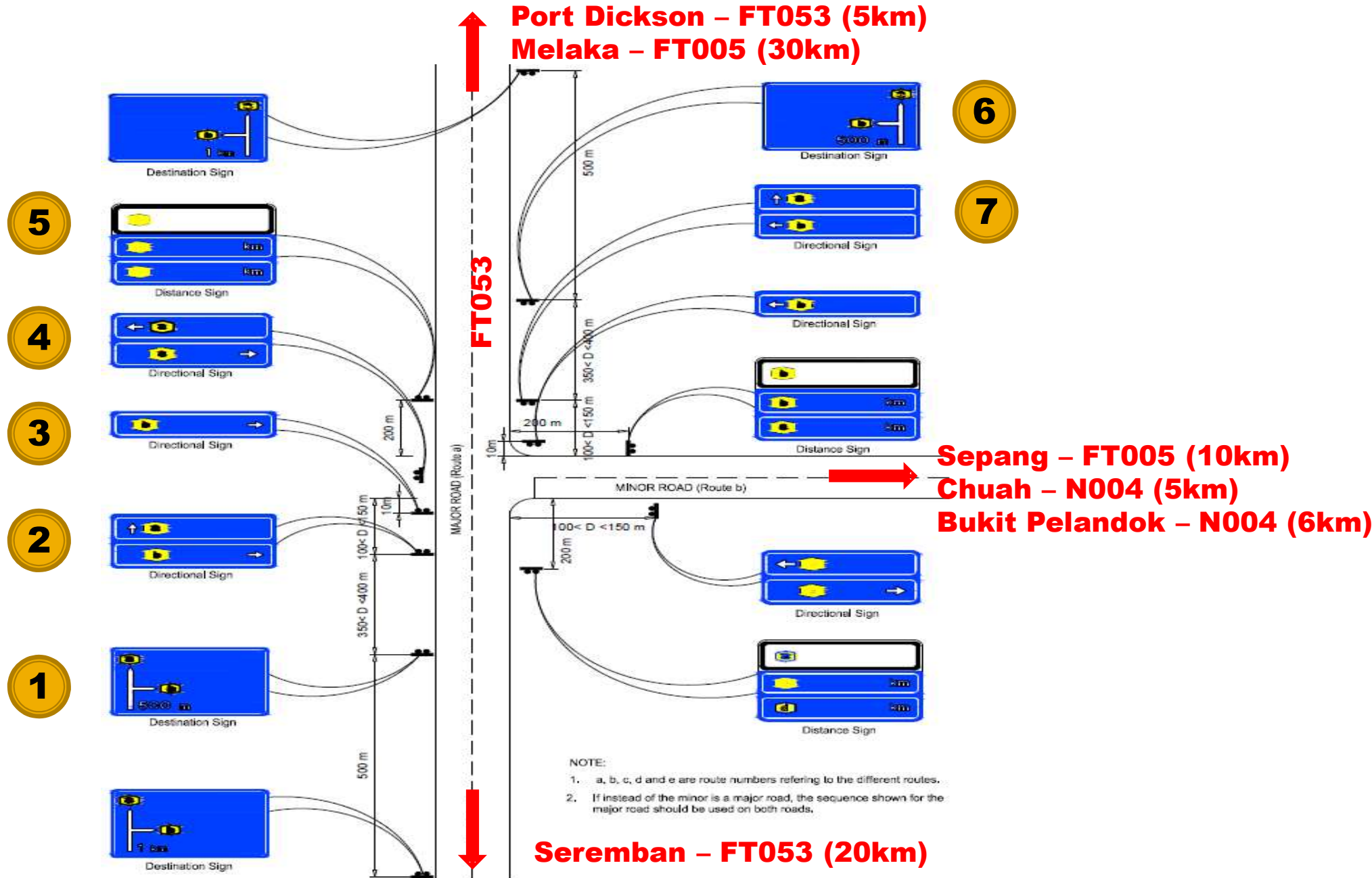
KEDUDUKAN ANAK PANAHAH

Table 2.5: Arrangement of Directional Arrows in Descending Order

	Should be located on the upper left-hand side of the sign to indicate straight through movement.
	Should be located on the left-hand side of the sign to indicate sharp turning movement to the left.
	Should be located on the lower left-hand side of the sign to indicate right-angle turning movement to the left.
Should be located on the lower right-hand side of the sign to indicate right-angle turning movement to the right.	
Should be located on the right hand side of the sign to indicate sharp turning movement to the right.	

Hands – on 1:

Rekabentuk papan tanda yang dinomborkan.



Hands – on 1 (Samb.):

Jawapan:



2

PENGIRAAN MOSAIC & SIMBOL

TRANSPORT HEAVY NORMAL LETTERS

A B C D E

F G H I J K

L M N O P

Q R S T U

V W X Y Z

a b c d e

f g h i j k

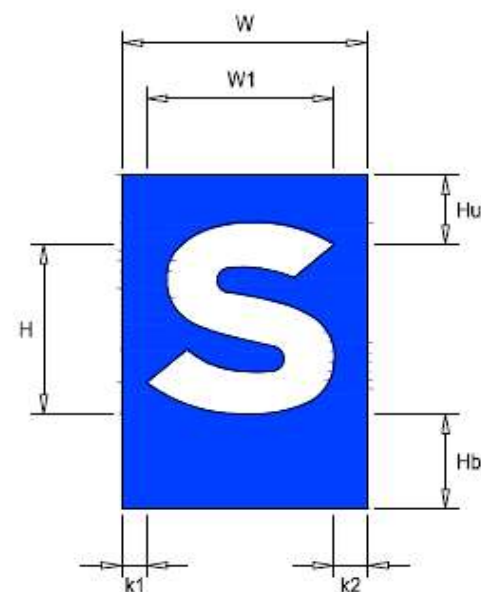
l m n o p

q r s t u

v w x y z

TABLE A.1 : UNIT LETTER HEIGHTS/LETTER WIDTHS, SPACING CONSTANTS, MOSAIC SIZES
(TRANSPORT HEAVY NORMAL LETTERS)

ALPHABET	k_1	k_2	w_1	W	ALPHABET	k_1	k_2	w_1	W
A	0.048	0.048	0.921	1.018	a	0.061	0.061	0.673	0.794
B	0.164	0.097	0.782	1.042	b	0.097	0.073	0.685	0.861
C	0.091	0.073	0.909	1.073	c	0.055	0.061	0.655	0.770
D	0.164	0.079	0.824	1.067	d	0.048	0.121	0.685	0.855
E	0.164	0.115	0.691	0.970	e	0.061	0.085	0.655	0.800
F	0.170	0.036	0.655	0.861	f	0.036	0.036	0.485	0.558
G	0.085	0.133	0.885	1.103	g	0.048	0.115	0.667	0.830
H	0.164	0.164	0.800	1.127	h	0.091	0.121	0.636	0.848
I	0.164	0.164	0.200	0.527	i	0.082	0.106	0.200	0.388
J	0.006	0.152	0.515	0.673	j	0.030	0.115	0.358	0.503
K	0.164	0.018	0.806	0.988	k	0.097	0.042	0.667	0.806
L	0.170	0.030	0.648	0.848	l	0.079	0.036	0.339	0.455
M	0.164	0.164	1.006	1.333	m	0.091	0.115	1.024	1.230
N	0.164	0.164	0.879	1.206	n	0.091	0.121	0.630	0.842
O	0.091	0.091	0.939	1.121	o	0.048	0.079	0.691	0.818
P	0.164	0.061	0.733	0.958	p	0.097	0.073	0.691	0.861
Q	0.091	0.091	0.964	1.145	q	0.055	0.115	0.679	0.848
R	0.158	0.097	0.788	1.042	r	0.109	0.055	0.418	0.582
S	0.073	0.115	0.855	1.042	s	0.036	0.067	0.618	0.721
T	0.027	0.027	0.782	0.836	t	0.055	0.055	0.497	0.606
U	0.139	0.139	0.824	1.103	u	0.091	0.121	0.636	0.848
V	0.058	0.058	0.836	0.952	v	0.036	0.042	0.679	0.758
W	0.079	0.079	1.236	1.394	w	0.055	0.055	1.030	1.139
X	0.030	0.030	0.861	0.921	x	0.036	0.036	0.709	0.782
Y	0.027	0.027	0.848	0.903	y	0.030	0.055	0.667	0.752
Z	0.061	0.079	0.709	0.848	z	0.055	0.061	0.552	0.667



k_1 & k_2 = SPACING CONSTANT

w_1 = LETTER WIDTH

W = MOSAIC WIDTH



TRANSPORT HEAVY NORMAL NUMERALS

1 2 3 4 5

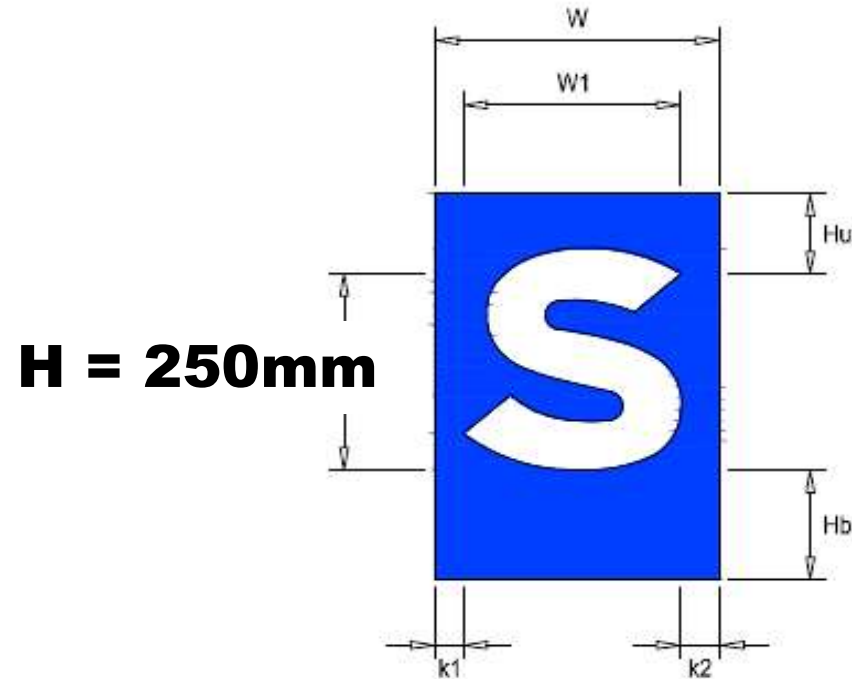
6 7 8 9 0

() ' - , .

TRANSPORT HEAVY NORMAL NUMERALS

NUMERAL	k ₁	k ₂	w ₁	W
1	0.061	0.158	0.364	0.582
2	0.036	0.091	0.721	0.848
3	0.061	0.121	0.752	0.933
4	0.012	0.085	0.861	0.958
5	0.103	0.073	0.733	0.909
6	0.073	0.073	0.739	0.885
7	0.012	0.036	0.691	0.739
8	0.109	0.109	0.739	0.958
9	0.073	0.085	0.752	0.909
0	0.085	0.085	0.824	0.994
(	0.103	0.206	0.479	0.788
)	0.206	0.103	0.479	0.788
(-)	0.048	0.012	0.218	0.279
(-)	0.061	0.109	0.315	0.485
,	0.036	0.133	0.218	0.388
.	0.073	0.121	0.182	0.376

PENGIRAAN REKABENTUK 1:



PENGIRAAN REKABENTUK 1 (Samb.):

LETTER TYPE - NORMAL

HEIGHT OF LETTER : H = 250 mm

The above calculation is as follows:-

From formulae:-

$$L = \{ SW - (k_1 + k_2) \} H$$

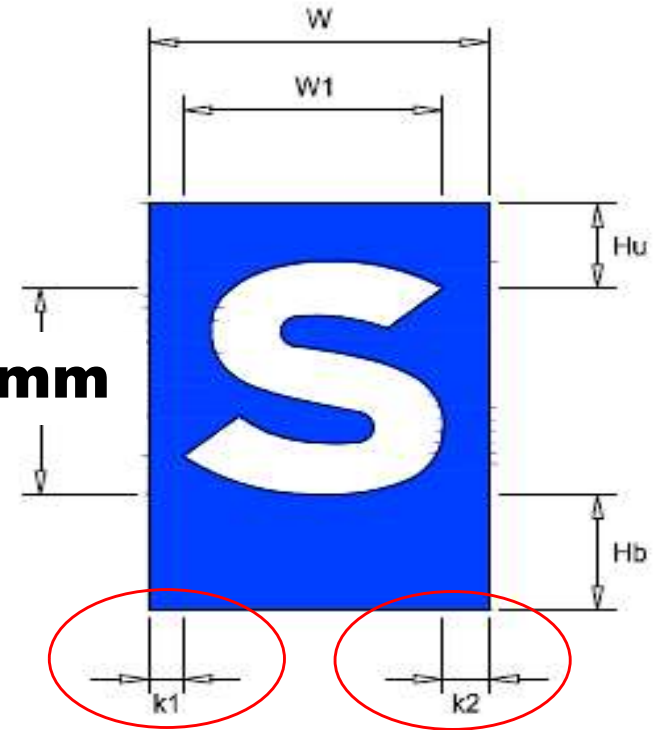
Where SW = $W_s + W_E + W_P + \dots W_G$

k_1 = Constant for first letter 'S' = 0.073

k_2 = Constant for last letter 'G' = 0.115

$$\begin{aligned} L &= \{(1.042 + 0.800 + 0.861 + 0.794 + 0.842 + 0.830) - (0.073 + 0.115)\} \times 250 \\ &= \{5.169 - 0.188\} \times 250 \\ &= 4.981 \times 250 \\ &= 1245.3 \quad \text{say } 1250 \text{ mm} \end{aligned}$$

H = 250mm



ALPHABET	k_1	k_2	w_1	W
A	0.048	0.048	0.921	1.018
B	0.164	0.097	0.782	1.042
C	0.091	0.073	0.909	1.073
D	0.164	0.079	0.824	1.067
E	0.164	0.115	0.691	0.970
F	0.170	0.036	0.655	0.861
G	0.085	0.133	0.885	1.103
H	0.164	0.164	0.800	1.127
I	0.164	0.164	0.200	0.527
J	0.006	0.152	0.515	0.673
K	0.164	0.018	0.806	0.988
L	0.170	0.030	0.648	0.848
M	0.164	0.164	1.006	1.333
N	0.164	0.164	0.879	1.206
O	0.091	0.091	0.939	1.121
P	0.164	0.061	0.733	0.958
Q	0.091	0.091	0.964	1.145
R	0.158	0.097	0.788	1.042
S	0.073	0.115	0.855	1.042
T	0.027	0.027	0.782	0.836
U	0.139	0.139	0.824	1.103
V	0.058	0.058	0.836	0.952
W	0.079	0.079	1.236	1.394
X	0.030	0.030	0.861	0.921
Y	0.027	0.027	0.848	0.903
Z	0.061	0.079	0.709	0.848

ALPHABET	k_1	k_2	w_1	W
a	0.061	0.061	0.673	0.794
b	0.097	0.073	0.685	0.861
c	0.055	0.061	0.655	0.770
d	0.048	0.121	0.685	0.855
e	0.061	0.085	0.655	0.800
f	0.036	0.036	0.485	0.558
g	0.048	0.115	0.667	0.830
h	0.091	0.121	0.636	0.848
i	0.082	0.106	0.200	0.388
j	0.030	0.115	0.358	0.503
k	0.097	0.042	0.667	0.806
l	0.079	0.036	0.339	0.455
m	0.091	0.115	1.024	1.230
n	0.091	0.121	0.630	0.842
o	0.048	0.079	0.691	0.818
p	0.097	0.073	0.691	0.861
q	0.055	0.115	0.679	0.848
r	0.109	0.055	0.418	0.582
s	0.036	0.067	0.618	0.721
t	0.055	0.055	0.497	0.606
u	0.091	0.121	0.636	0.848
v	0.036	0.042	0.679	0.758
w	0.055	0.055	1.030	1.139
x	0.036	0.036	0.709	0.782
y	0.030	0.055	0.667	0.752
z	0.055	0.061	0.552	0.667

PENGIRAAN REKABENTUK 1 (Samb.):

LETTER TYPE - NORMAL

HEIGHT OF LETTER : $H = 250 \text{ mm}$

To calculate height of mosaic (H_m)

$$H_u = 0.085 H$$

$$H_b = 0.364 H$$

$$H_m = H_u + H + H_b$$

$$= 0.085 (250) + 250 + 0.364 (250)$$

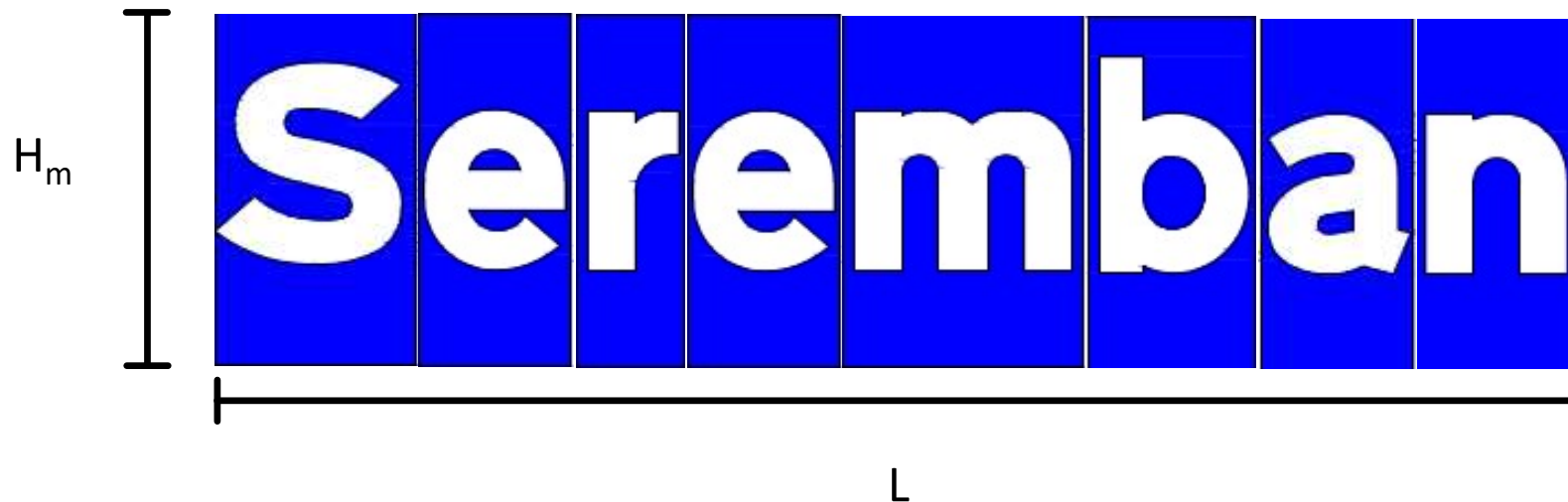
$$= 362.3 \text{ say } 365 \text{ mm}$$

$$H_m = 365 \text{ mm}$$



Hands – on 2:

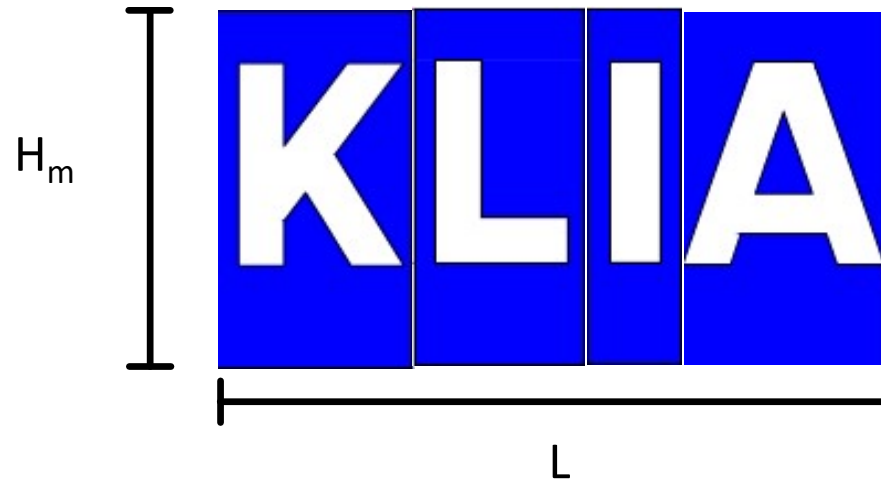
Speed limit jalan = 90km/j (single carriageway), tentukan nilai H_m dan L .



Jawapan:

Hands – on 3:

Speed limit jalan = 60km/j (dual carriageway), tentukan nilai H_m dan L .

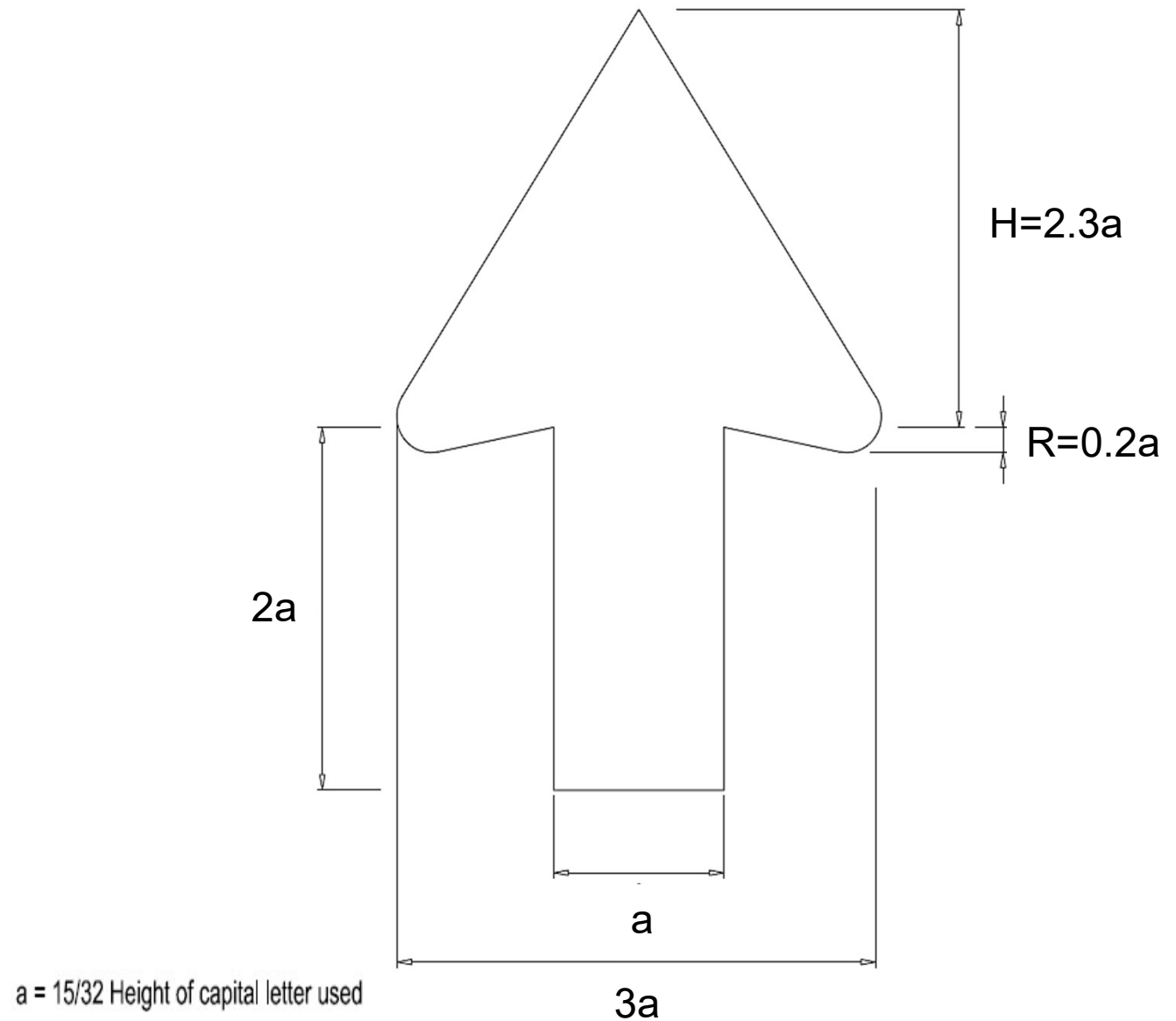


Jawapan:

Hands – on 4:

Speed limit jalan = 90km/j (single carriageway), tentukan saiz **ARROW**.

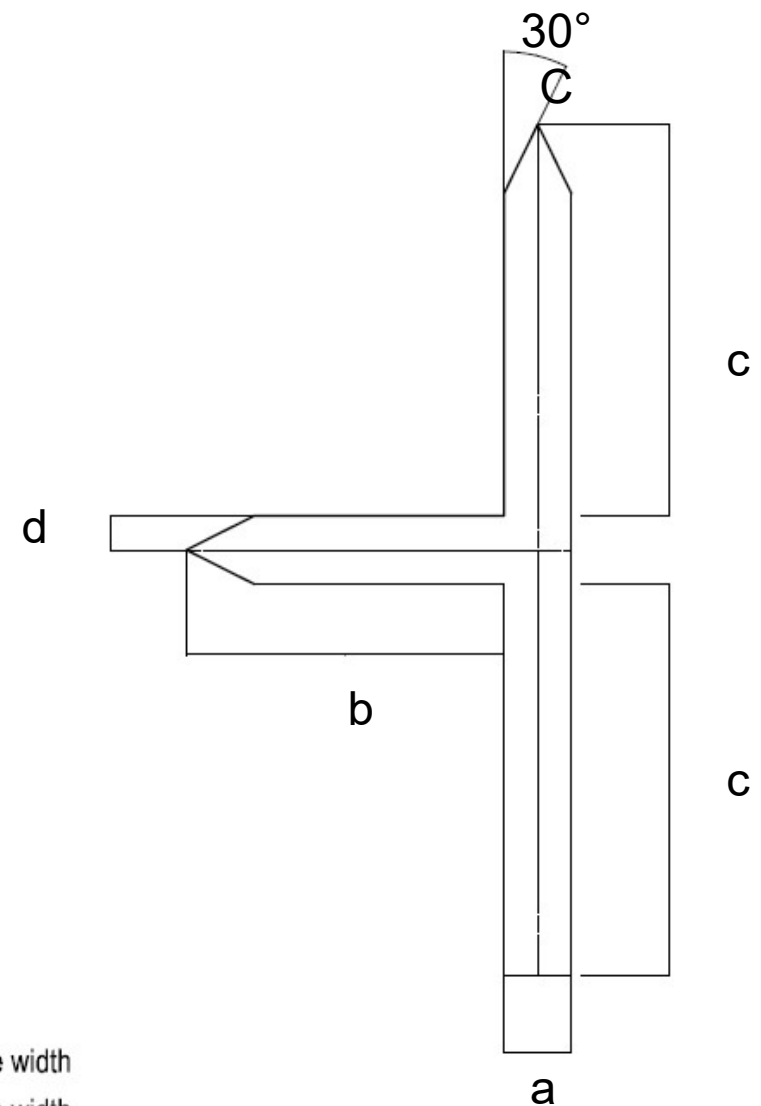
Jawapan:



Hands – on 5:

Speed limit jalan = 90km/j (single carriageway), tentukan saiz **DIAGRAMATIC POINTERS** berikut.

Jawapan:



NOTE :

a - 3 times stroke width

b - 14 times stroke width

c - 17 times stroke width **d – 1.5 times stroke width**

Stroke width = 1/5 height of capital letter used

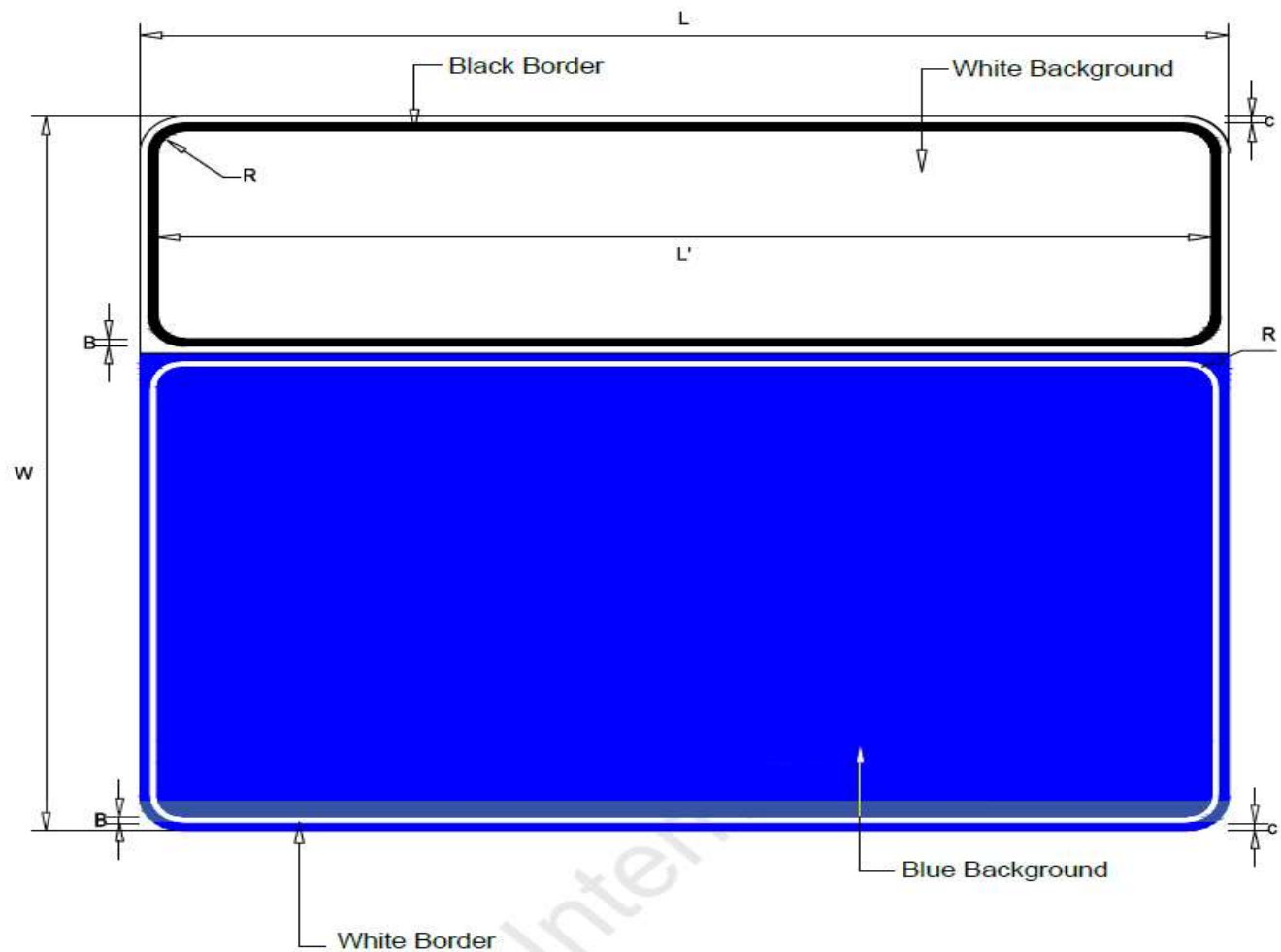


3

**PENGIRAAN
SAIZ PAPAN
TANDA
TUNJUK ARAH**

DIMENSI

FIGURE 2.1: DIMENSION AND BORDER DETAILS



DIMENSIONS	
L = Overall length of sign panel	Varies
L' = Internal length in between borders	Calculated from letters and spacing
W = Overall height of sign panel	Varies
R = Internal radius of border	$2 \% \times L'$
B = Thickness of border	$1.5 \% \times L'$ or 20mm whichever is greater
C = Distance between edge of sign panel and outer edge of border	$0.5 \times B$

ROUTE NUMBER

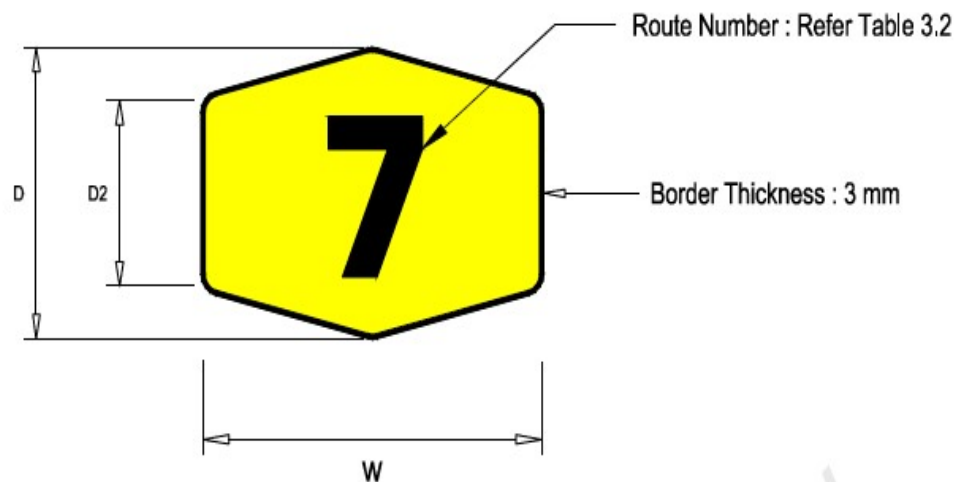


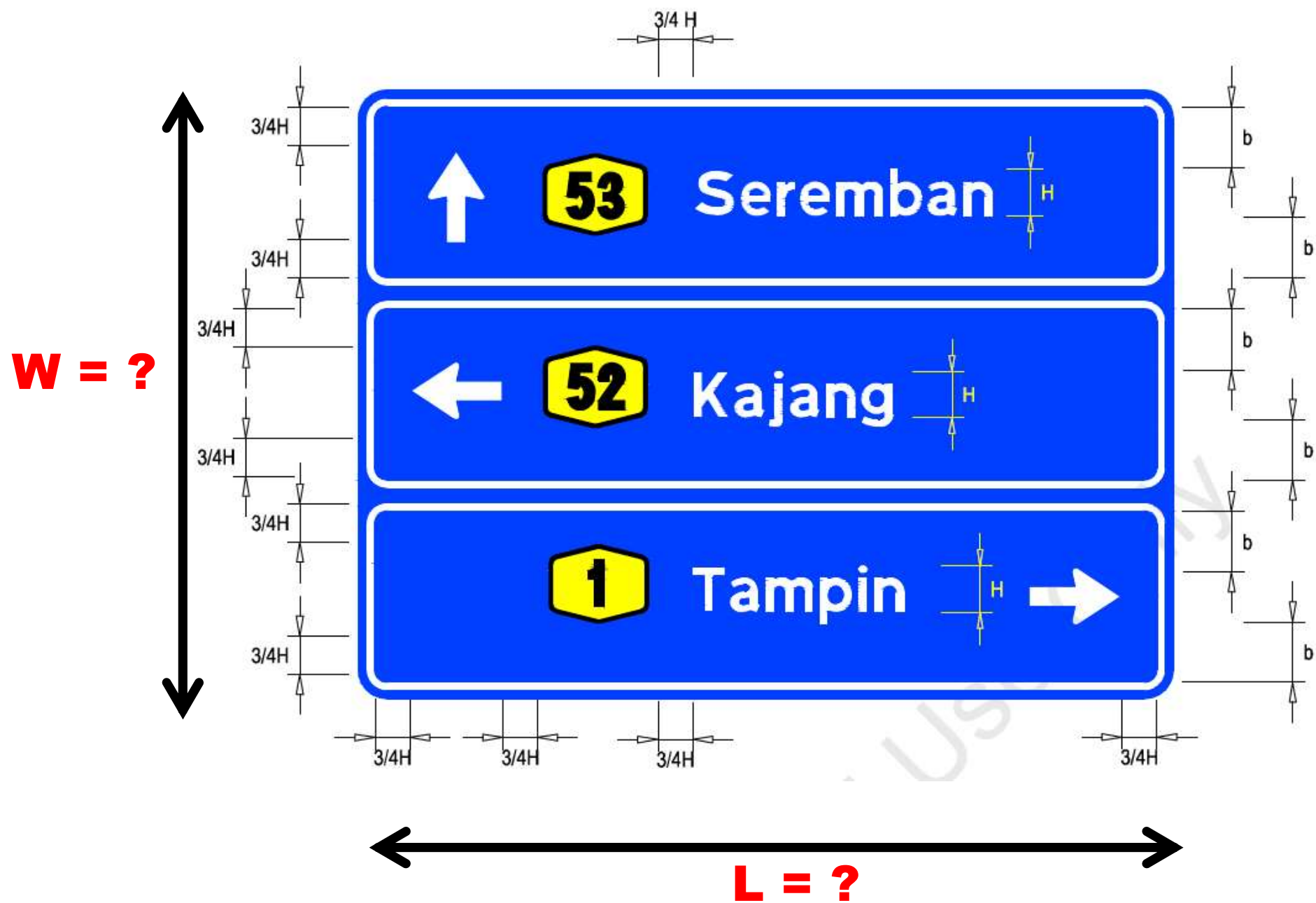
Table 3.2: Details Of Route Number Markers

Size of Route Marker (D x W x D2)	Single Carriageway Letter Height, H (mm)	Multiple Carriageway/ Gantry Letter Height, H (mm)	No. Of Numeral & Alphabet	H, Route Number Height
525 x 700 x 350	250	300	1 to 2 3 4	300 300 ³ 300 ⁵
525 x 700 x 350	200	250	1 to 2 3 4	250 250 250
525 x 700 x 350	150	200	1 to 2 3 4	200 200 200 ³
450 x 600 x 300	150	-	1 to 2 3 4	150 150 ² 150 ³

NOTES:

- 1) 5% reduction in lettering width.
- 2) 15% reduction in lettering width.
- 3) 25% reduction in lettering width.
- 4) 30% reduction in lettering width.
- 5) 50% reduction in lettering width.

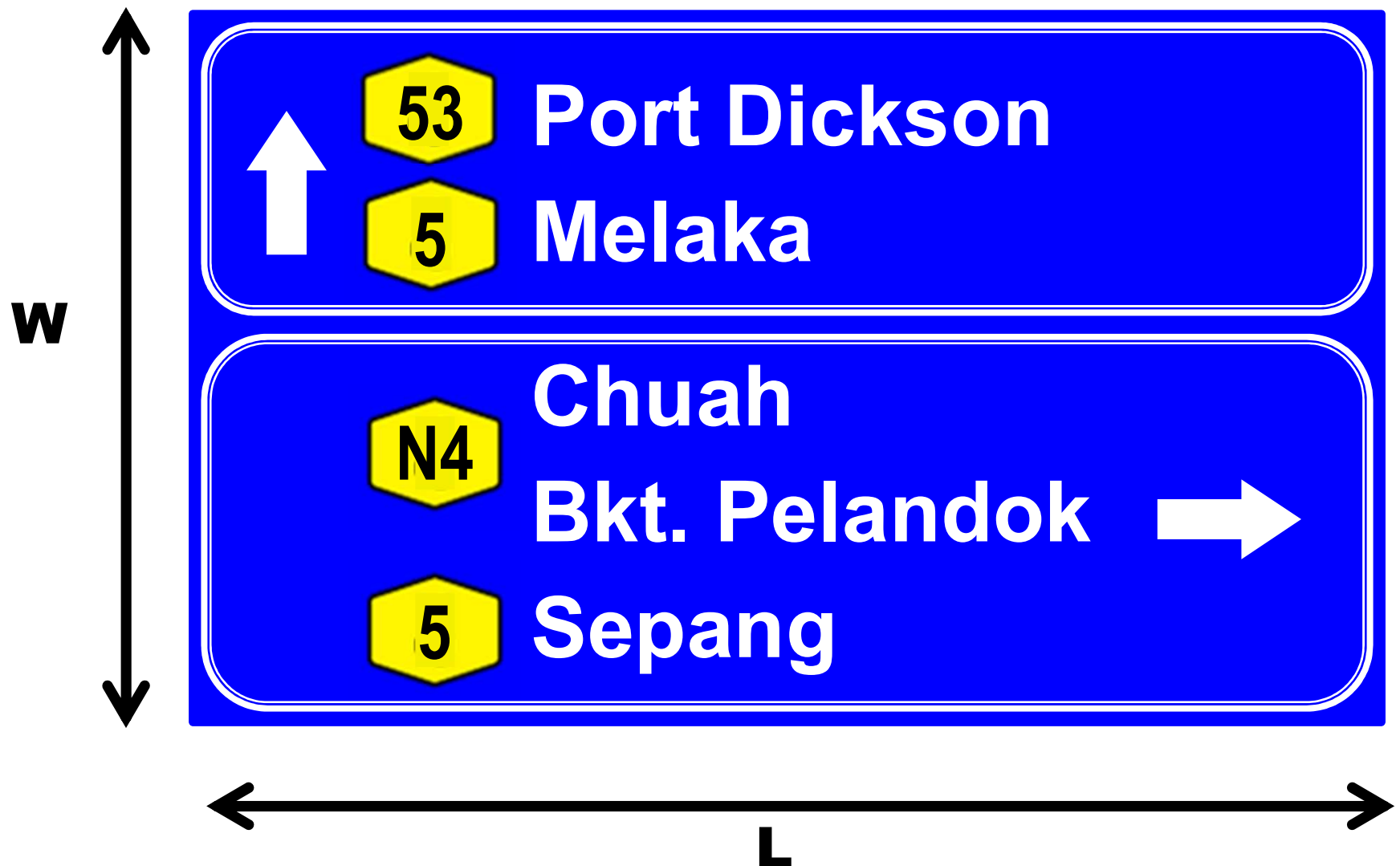
PENGIRAAN REKABENTUK 4:



PENGIRAAN REKABENTUK 4 (Samb.):

Hands – on 6:

Speed limit jalan = 80km/j (single carriageway), tentukan saiz papan tanda berikut:



Hands – on 6 (Samb.):

Jawapan: