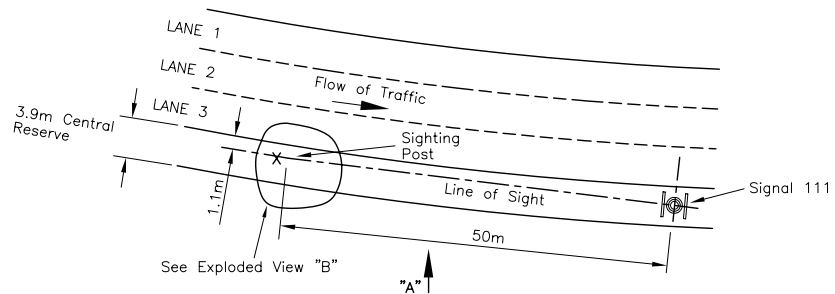
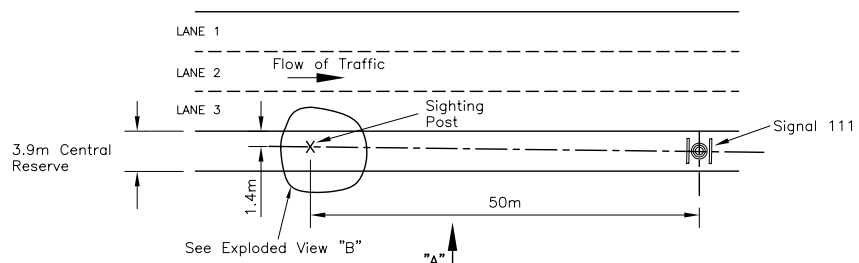


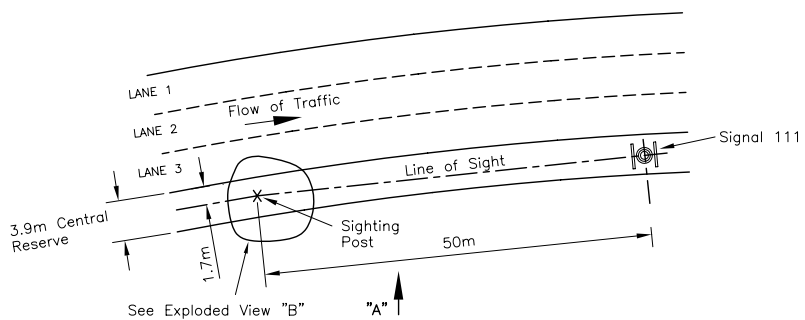
MCX 0000 – 0068
NOT USED



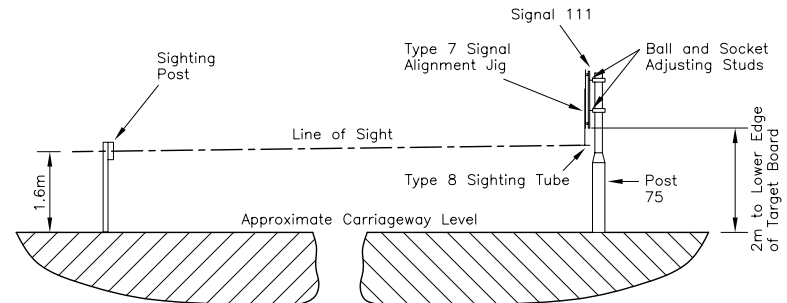
PART PLAN OF MOTORWAY
(CARRIAGEWAY CURVING AWAY FROM LANE 3)



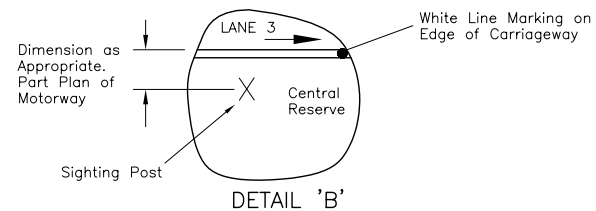
PART PLAN OF MOTORWAY
(STRAIGHT CARRIAGEWAY)



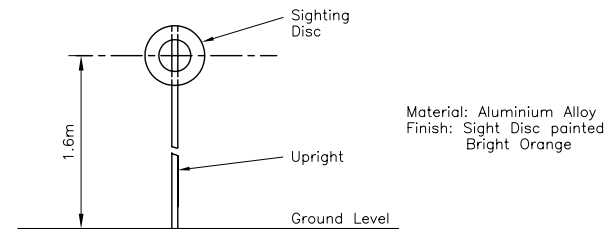
PART PLAN OF MOTORWAY
(CARRIAGEWAY CURVING TOWARD LANE 3)



VIEW ON ARROW 'A'



DETAIL 'B'



DETAILS OF SIGHTING POST TYPE 9

(REV. 1)

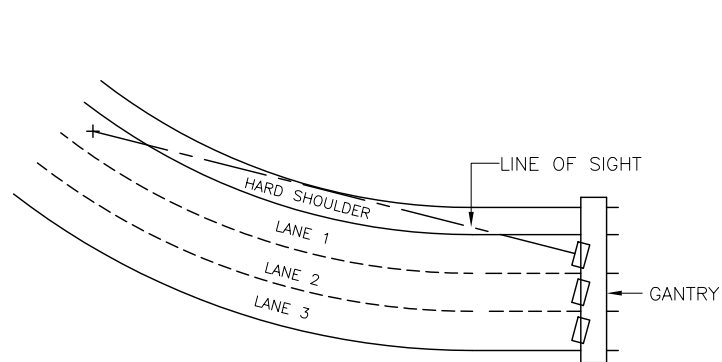
This drawing was generated on computer and must not be manually updated

HIGHWAY CONSTRUCTION DETAILS

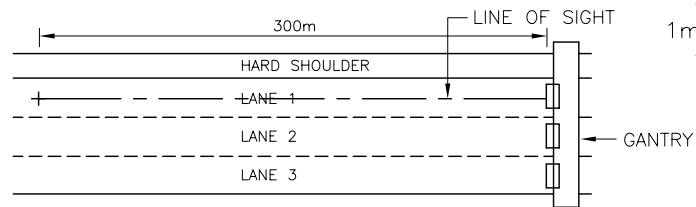
TITLE INSTALLATION DRAWING NMCS 1 & 2
SIGNAL ALIGNMENT & SIGHTING POST DETAILS
(ALIGNMENT OF MOTORWAY MATRIX INDICATORS - POST MOUNTED)

ORIGINAL DRAWING SIZE: 297 x 420	DRN	PJS	CHKD	DJM	SCALE
ALL DIMENSIONS ARE IN MM		15.6.94		17.6.94	NTS
TOLERANCE ± UNLESS OTHERWISE STATED	DRG. NO.	MCX 0069			SHT. NO.
THIRD ANGLE PROJECTION DO NOT SCALE					1 of 7

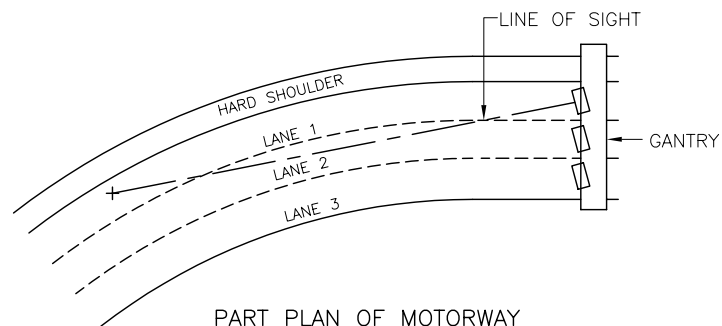
H	HA ADDRESS REPLACED BY HIGHWAY CONSTRUCTION DETAILS	DWE 02.06
G	ADDRESS & LOGO REVISED COPYRIGHT NOTICE REMOVED	DWE 02.02
F	NEW DRAWING BLANK	FJC 1.7.97
A	INITIAL ISSUE	WSH 1/2/73
ISSUE	AMENDMENTS	APPD/DATE



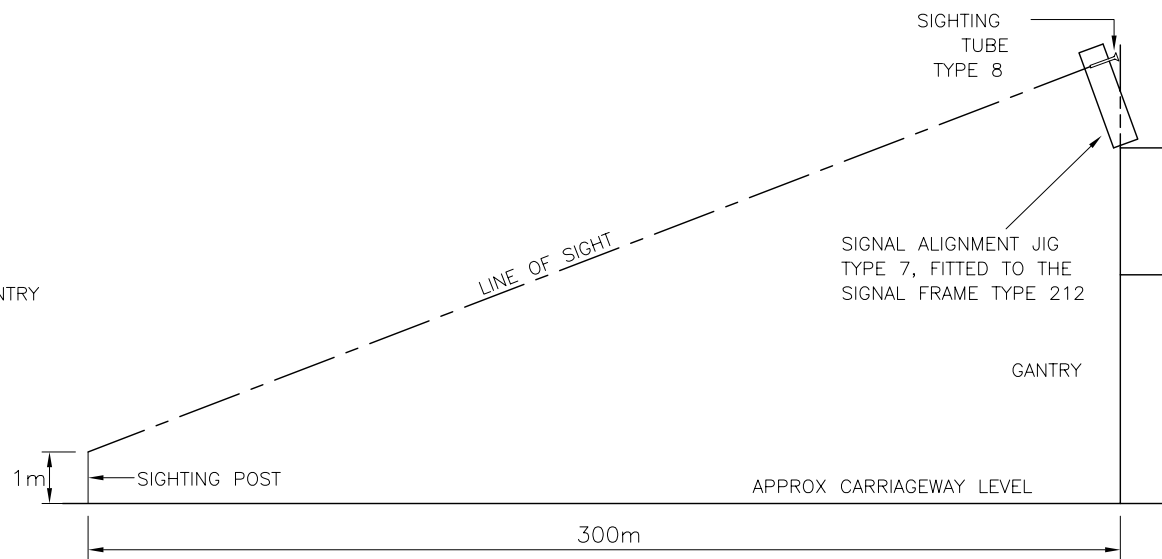
PART PLAN OF MOTORWAY
(LEFT HAND BEND APPROACHING GANTRY)



PART PLAN OF MOTORWAY
(STRAIGHT CARRIAGEWAY)



PART PLAN OF MOTORWAY
(RIGHT HAND BEND APPROACHING GANTRY)



METHOD OF SIGNAL ALIGNMENT

NOTES

1. DETAILS SHOWN ARE FOR 3 LANE CARRIAGEWAYS BUT THESE PRINCIPLES APPLY EQUALLY TO 2 LANE, 4 LANE CARRIAGEWAYS ETC. (N.B. BENDS ARE EXAGGERATED TO SHOW THE PRINCIPLE OF SIGNAL ALIGNMENT.)
2. ALIGNMENT PROCEDURES:
 - a) FOR CLOSED CARRIAGEWAYS (e.g. DURING CONSTRUCTION) THE SIGHTING POST SHALL BE SITUATED IN THE CENTRE OF THE RESPECTIVE LANE.
 - b) FOR OPEN CARRIAGEWAYS (e.g. WITH FLOWING TRAFFIC) THE SIGHTING POST SHALL BE LOCATED ON THE HARD SHOULDER. (SUITABLE PROVISIONS SHALL BE MADE FOR PROTECTION OF PERSONNEL ON THE HARD SHOULDER.
 - c) INDICATORS (WHERE PREVIOUSLY FITTED) SHALL BE REMOVED AND REPLACED BY THE SIGNAL ALIGNMENT JIG TYPE 7 (FITTED WITH THE SIGHTING TUBE TYPE 8).
 - d) FOR OPEN CARRIAGEWAYS AFTER THE DECLINATION OF THE INDICATOR HAS BEEN ESTABLISHED, THE INDICATOR SHALL BE PIVOTED TO THE FINAL SIGHTING LINE, AS SHOWN IN THE DIAGRAMS.
3. DETAILS OF SIGHTING POST ARE SHOWN ON SHEET 1.

(REV. 1)

This drawing was generated on computer and must not be manually updated

ORIGINAL DRAWING SIZE: 297 x 420
ALL DIMENSIONS ARE IN MM
TOLERANCE ± UNLESS OTHERWISE STATED
THIRD ANGLE PROJECTION DO NOT SCALE

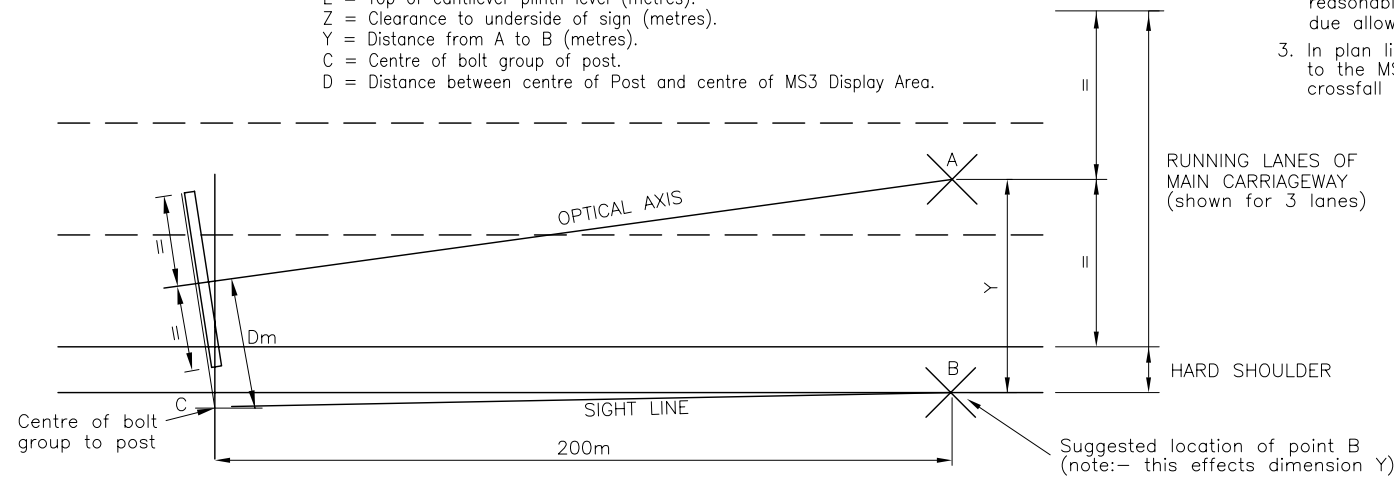
F	HA ADDRESS REPLACED BY HIGHWAY CONSTRUCTION DETAILS	DWE 02.06
E	ADDRESS & LOGO REVISED COPYRIGHT NOTICE REMOVED	DWE 02.02
D	NEW DRAWING BLANK	FJC 1.7.97
A	INITIAL ISSUE	AGR 18/8/88
ISSUE	AMENDMENTS	APPD/DATE
DRN	E.E.D	CHKD D. OWEN
DATE	1.11.93	DATE 19.11.93
DRG. NO.	MCX 0069	
		SHT. NO. 2 of 7

HIGHWAY CONSTRUCTION DETAILS

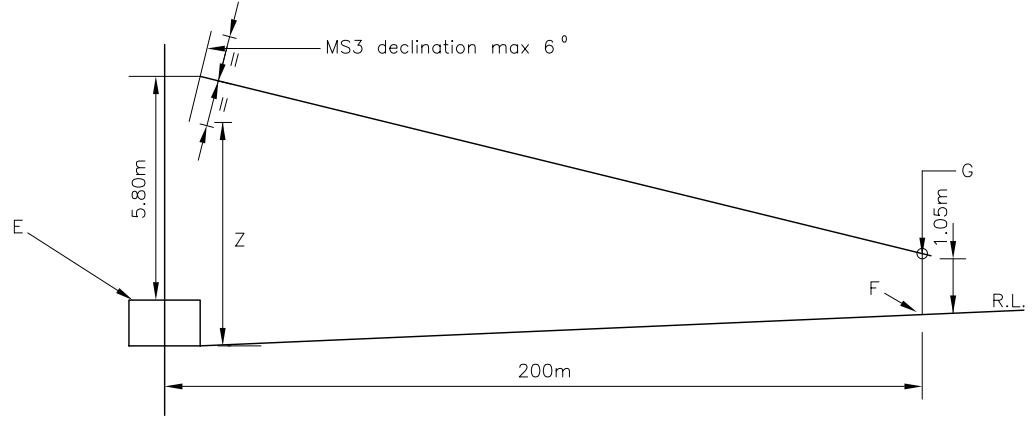
TITLE
INSTALLATION DRAWING NMCS 1 & 2
GANTRY SIGNAL INDICATOR ALIGNMENT DETAILS

KEY.
 A = Location of optimum viewing point:-centre of running lanes
 B = Sighting point at the back of hard shoulder or other convenient point on hardshoulder.
 F = Carriageway level at optimum viewing point (metres).
 G = Optimum viewing point above carriageway (eye level)=F+1.05m.
 E = Top of cantilever plinth level (metres).
 Z = Clearance to underside of sign (metres).
 Y = Distance from A to B (metres).
 C = Centre of bolt group of post.
 D = Distance between centre of Post and centre of MS3 Display Area.

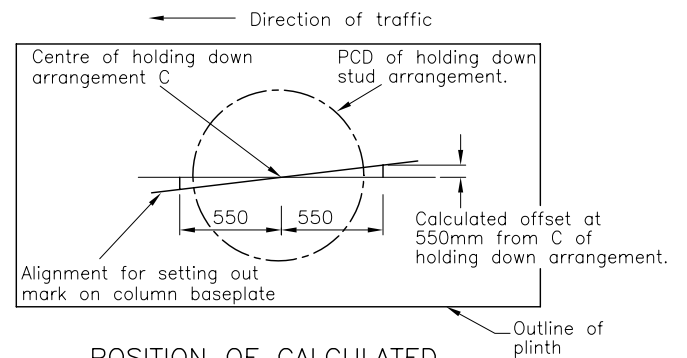
NOTES
 1. Distance Y may be estimated with reasonable accuracy from lane widths relative to position B.
 2. Level F may be estimated with reasonable accuracy from level at B with due allowance for crossfall to A.
 3. In plan line EF passes through the centre of and is normal to the MS3. Vertically E and F are on projections of the crossfall from the adjacent carriageway. G is 1.05m above F.



TYPICAL PLAN ON ALIGNMENT ARRANGEMENT



Offset from vertical in $1\text{m height of MS3} = \frac{(E+5.80)-(G)}{200} \times 1000\text{mm}$ TYPICAL LONGITUDINAL PROFILE ON ALIGNMENT ARRANGEMENT



POSITION OF CALCULATED OFFSET ON THE TOP OF CANTILEVER PLINTH

(REV. 1)

This drawing was generated on computer and must not be manually updated

HIGHWAY CONSTRUCTION DETAILS

TITLE
 INSTALLATION DRAWING NMCS 2
 MOTORWAY SIGNALS MK3 AND MESSAGE SIGNS
 CANTILEVER SIGN SETTING OUT AND OPTICAL ALIGNMENT

ORIGINAL DRAWING SIZE: 297 x 420
 ALL DIMENSIONS ARE IN MM
 TOLERANCE ±1 UNLESS OTHERWISE STATED
 THIRD ANGLE PROJECTION DO NOT SCALE

F	HA ADDRESS REPLACED BY HIGHWAY CONSTRUCTION DETAILS	DWE 02.06
E	ADDRESS & LOGO REVISED COPYRIGHT NOTICE REMOVED	DWE 02.02
D	DRG TITLE REVISED REVISION AREAS MARKED	AW 8.99
C	UPDATED TO SUIT MK3 & EMS MOTORWAY SIGNALS FROM MK2	KRL 17.9.98
B	NEW DRAWING BLANK	FJC 1.7.97
A	INITIAL ISSUE PREVIOUS DRG. No. MCX 0585	PM 18/7/94
ISSUE	AMENDMENTS	APPD/DATE
DRN	M.A.P	CHKD I.D.R
DATE	FEB 92	DATE JUNE 92
DRG. NO.	MCX 0069	
		SHT. NO. 3 of 7

PROFORMA SETTING OUT SHEET Refer to Drawing MCX 0069 Sheet 3 of 7		
Surveyed	Signed _____ Name _____ Date ___/___/___	Site No _____
Checked	Signed _____ Name _____ Date ___/___/___	Marker Ref No _____
1.	Select 'offset setting out point' (Point B) in hardshoulder 200 metres in front of cantilever base from which top of cantilever base plinth may be seen.	
2.	Lane widths (usually 3.65m) (Estimated/measured/from drawing) * ② Distance from edge of running lanes to Point B ③ $(\textcircled{1} / 2 \times \textcircled{2}) + \textcircled{3} = Y$ Calculate 'OFFSET' = $550 \times (Y - 3.605) - 200$	m m m mm
3.	With theodolite at Point B sight on centre of holding down arrangement (half distance between studs at point 90° (±5') to front face of plinth). Mark the line of sight from Point B on the top of the plinth 550mm either side of the centre of the holding down	
4.	Mark on top of plinth the alignment for the signal which is the line of sight from Point B rotated anticlockwise by the 'OFFSET' at a point 550mm from the centre of the holding down arrangement. Set marks on baseplate of cantilever to this alignment.	
5.	Take level E on top of plinth. Add height to centre of signal. = Level of centre of signal. ④	5.800 m m m
6.	Take level F of surface at Point B . Crossfall of carriageway (Estimated/measured/from drawing) * [%] Y ⑤ Crossfall (+ = fall towards hardshoulder). Add height of driver's eye. = Level of driver's eye. ⑥	m m 1.050 m m
7.	Angular tilt of signal forwards $\tan^{-1}((\textcircled{4} - \textcircled{5}) \div 200) \cdot \textcircled{6}$	deg.
8.	Offset in vertical in one metre height of signal. $\tan (\textcircled{6} \times 1000)$.	mm

Notes :-

Crossfall of carriageway 2.5% normal & minimum, 7% maximum.

* Delete as appropriate.

(REV. F)

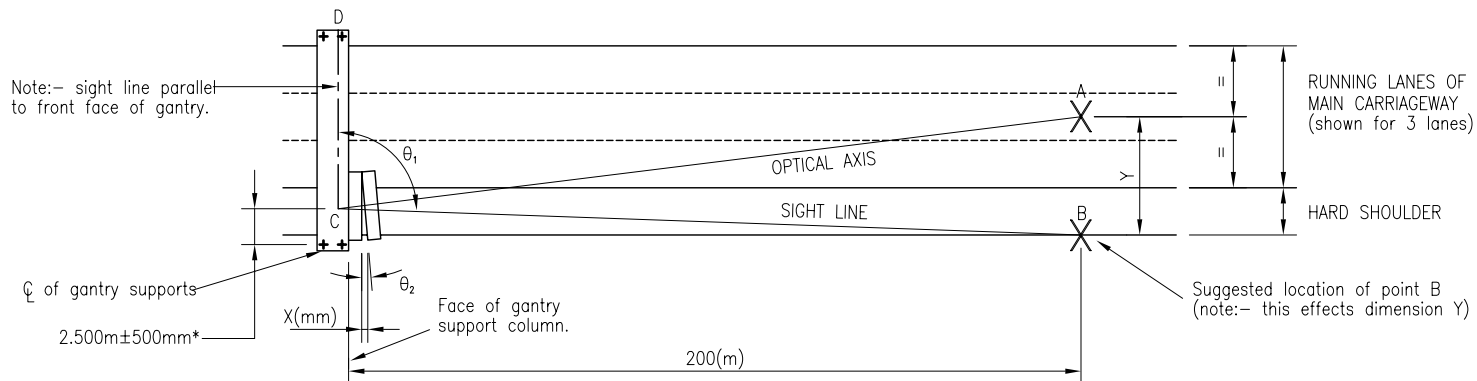
This drawing was generated on computer and must not be manually updated

HIGHWAY CONSTRUCTION DETAILS	TITLE	INSTALLATION DRAWING NMCS 2 MOTORWAY SIGNALS MK3 AND MESSAGE SIGNS CANTILEVER SIGN SETTING OUT AND OPTICAL ALIGNMENT	ORIGINAL DRAWING SIZE: 297 x 420	DRN	M.L	CHKD	RJG	SCALE
			ALL DIMENSIONS ARE IN MM	DATE	OCT 93	DATE	OCT 93	NTS
			TOLERANCE ± UNLESS OTHERWISE STATED THIRD ANGLE PROJECTION DO NOT SCALE	DRG. NO.	MCX 0069		SHT. NO.	4 of 7

SURVEY SKETCH SHEET Refer to Drawing MCX 0069 Sheet 3 of 7		
Surveyed	Signed _____ Name _____ Date ___/___/___	Site No _____
Checked	Signed _____ Name _____ Date ___/___/___	Marker Ref No _____

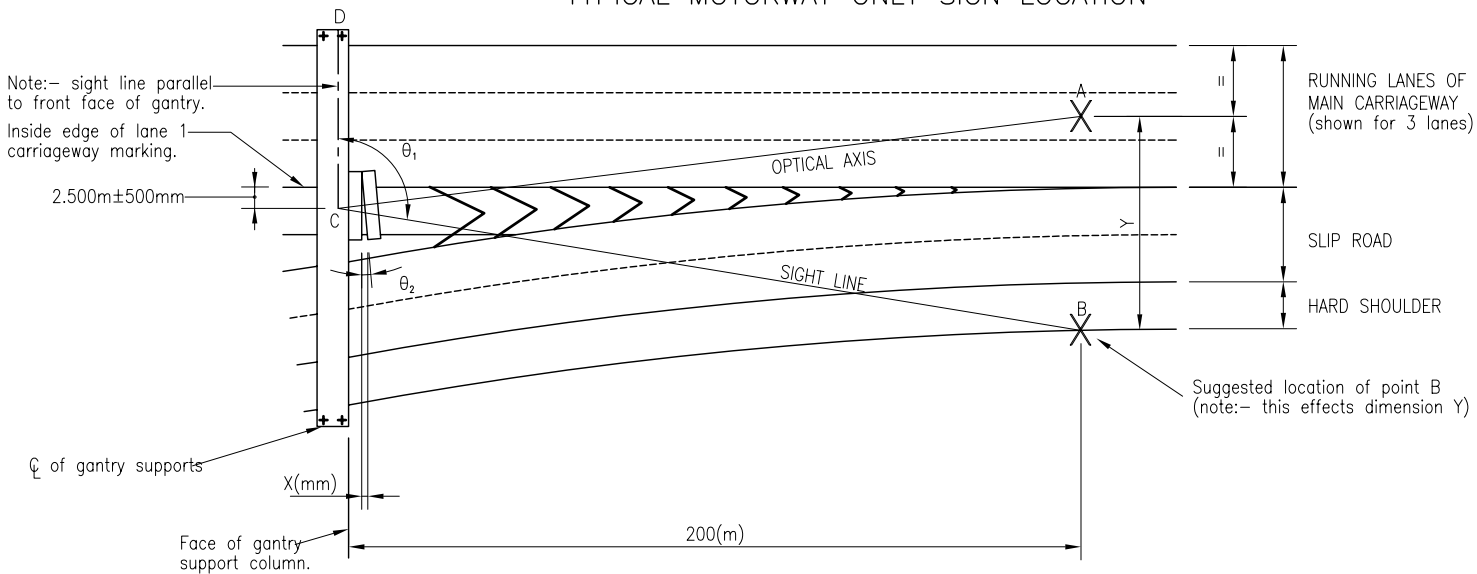
Area provided for site sketches

F	HA ADDRESS REPLACED BY HIGHWAY CONSTRUCTION DETAILS	DWE 02.06
E	ADDRESS & LOGO REVISED COPYRIGHT NOTICE REMOVED	DWE 02.02
D	DRG TITLE REVISED REVISION AREAS MARKED	AW 8.99
C	UPDATED TO SUIT MK3 & EMS MOTORWAY SIGNALS FROM MK2	KRL 17.9.98
B	NEW DRAWING BLANK	DWE 7.97
A	INITIAL ISSUE PREVIOUS DRG. NO. MCX 0585	P.M 18/7/94
ISSUE	AMENDMENTS	APPD/DATE



*Note: Where the clearance between the hardshoulder and the face of the gantry supports is substantially in excess of 1.5m, these dimensions will need to be increased or the method detailed below can be used.

TYPICAL MOTORWAY ONLY SIGN LOCATION



TYPICAL MOTORWAY & SLIP ROAD SIGN LOCATION

NOTES

1. This drawing is to be read in conjunction with sheet 2.

2. Distance Y may be estimated with reasonable accuracy from lane widths and measurement of position B in relation to hard shoulder.

A=Location of optimum viewing point :- centre of running lanes of main carriageway.

B=Sighting point at the back of the hard shoulder or other convenient safe location.

C=Position of measuring instrument on gantry.

D=Sighting point on the end of the gantry, set out parallel to the face of the gantry from measuring point C.

θ_1 =Measured angle from point B to point D from point C.

θ_2 =Skew angle of sign relative to face of gantry.

x=Calculated offset (see sheet 2 for calculation and formulae.)

3. For new gantries where existing alignment is not being altered, calculate θ_2 from setting out data for new gantry foundations. For new gantries on a new road alignment, calculate θ_2 from alignment drawings and setting out data for gantry foundations.

(REV. P)

This drawing was generated on computer and must not be manually updated

HIGHWAY CONSTRUCTION DETAILS

TITLE
INSTALLATION DRAWING NMCS 2
MOTORWAY SIGNALS MK3 AND MESSAGE SIGNS
GANTRY SIGN SETTING OUT AND OPTICAL ALIGNMENT

ORIGINAL DRAWING SIZE: 297 x 420
ALL DIMENSIONS ARE IN MM
TOLERANCE ± UNLESS OTHERWISE STATED
THIRD ANGLE PROJECTION DO NOT SCALE

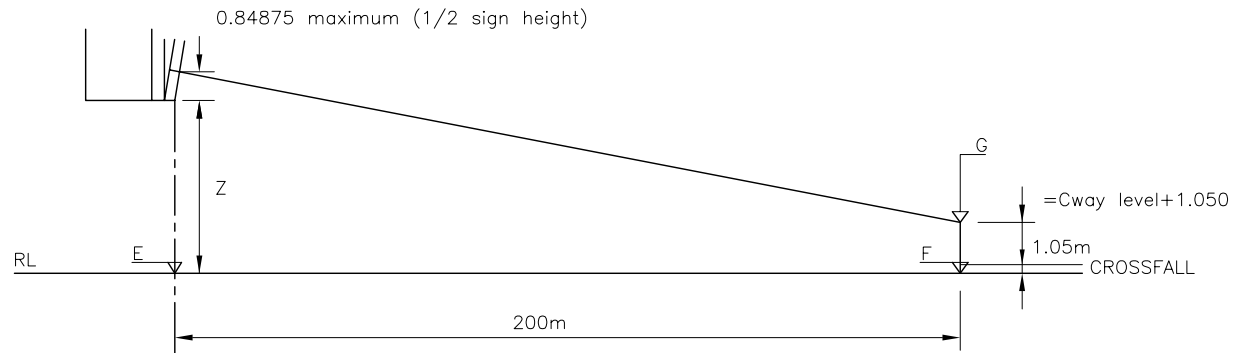
DRN M.A.P
DATE FEB 92

CHKD IDR
DATE JUNE 92

DRG. NO. **MCX 0069**

SCALE
NTS
SHT. NO.
5 of 7

F	HA ADDRESS REPLACED BY HIGHWAY CONSTRUCTION DETAILS	DWE 02.06
E	ADDRESS & LOGO REVISED COPYRIGHT NOTICE REMOVED	DWE 02.02
D	DRG TITLE REVISED REVISION AREAS MARKED	AW 8.99
C	UPDATED TO SUIT MK3 & EMS MOTORWAY SIGNALS FROM MK2	DWE 9/98
B	NEW DRAWING BLANK	DWE 7.97
A	INITIAL ISSUE PREVIOUS DRG. NO. MCX 0586	PM 18/7/94
ISSUE	AMENDMENTS	APPD/DATE



TYPICAL LONGITUDINAL PROFILE
ON ALIGNMENT ARRANGEMENT

CALCULATION PROCEDURES

Horizontal Value X

1. Calculate value θ_2 from the following formula

$$\theta_2 = 90 - \theta_1 + \tan^{-1} \left(\frac{Y}{200} \right)$$

where θ_1 = the measured site angle from B to D taken at C.

2. Having calculated θ_2 derive value X from the following formula

$$X = 3800 \sin \theta_2 \text{ (in mm)}$$

Vertical Offset

3. Offset from vertical in 1m height of sign

$$\text{Offset} = \frac{(\text{Level E} + Z + (0.5 \times \text{Sign Height}) - \text{Level G})}{200}$$

F	HA ADDRESS REPLACED BY HIGHWAY CONSTRUCTION DETAILS	DWE 02.06
E	ADDRESS & LOGO REVISED COPYRIGHT NOTICE REMOVED	DWE 02.02
D	DRG TITLE REVISED REVISION AREAS MARKED	AW 8.99
C	UPDATED TO SUIT MK3 & EMS MOTORWAY SIGNALS FROM MK2	KRL 17.9.98
B	NEW DRAWING BLANK	DWE 7.97
A	INITIAL ISSUE PREVIOUS DRG NO. MCX 0586	PM 18/7/94
ISSUE	AMENDMENTS	APPD/DATE
DRN	G.W	CHKD R.J.G
DATE	OCT 93	DATE DEC 93
DRG. NO.	MCX 0069	
		SHT. NO. 6 of 7

(REV. F)

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ORIGINAL DRAWING SIZE: 297 x 420
ALL DIMENSIONS ARE IN MM
TOLERANCE ± UNLESS OTHERWISE STATED
THIRD ANGLE PROJECTION DO NOT SCALE

HIGHWAY CONSTRUCTION DETAILS

TITLE
INSTALLATION DRAWING NMCS 2
MOTORWAY SIGNALS MK3 AND MESSAGE SIGNS
GANTRY SIGN SETTING OUT AND OPTICAL ALIGNMENT



PROFORMA SETTING OUT SHEET Refer to Drawing MCX 0069 Sheet 5 of 7

Surveyed	Signed _____	Name _____	Date ___/___/___	Site No _____
Checked	Signed _____	Name _____	Date ___/___/___	Marker Ref No _____
1.	Select 'offset setting out point' (Point B) in hardshoulder 200 metres in front of gantry base from which top of gantry base plinth may be seen.			
2.	Lane widths (usually 3.65m) (Estimated/measured/from drawing) * ② Distance from edge of running lanes to Point B ③ (① / 2 x ②) + ③ = Y			m m m
3.	Set up theodolite at Point C on gantry immediately behind intended position of signal. Measure distance on centre of instrument to front face of gantry longitudinal member. ④			
4.	Establish Point D on a transverse member at far end of gantry ⑤ mm from front face of gantry longitudinal member.			
5.	Sight on Point B , take face left reading to Point D Sight on Point B , take face right reading to Point D Addition of the two readings θ ₁ = Average of the two readings ⑥		
6.	θ ₂ = 90 - ⑥ + Tan ⁻¹ (Y ÷ 200)			. . .
7.	X = 3800 Sin θ ₁			mm mm
8.	Take level at Point E in hardshoulder below gantry. Measure Z from surface of hard shoulder to underside of gantry. Add height to centre of sign. = Level of centre of sign. ⑦			m m m
9.	Take level F of surface at Point B . Crossfall of carriageway (Estimated/measured/from drawing) * [%] Y ⑧ Crossfall (+ = fall towards hardshoulder). Add height of driver's eye. = Level of driver's eye. ⑨			m m m
10.	Angular tilt of sign forwards Tan ⁻¹ ((⑩ - ⑨) ÷ 200). ⑩			deg.
11.	Offset in vertical in one metre height of signal. Tan (⑪ x 1000).			mm

Notes :- Crossfall of carriageway 2.5% normal & minimum, 7% maximum.
* Delete as appropriate.

(REV. F)

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HIGHWAY CONSTRUCTION DETAILS

TITLE
INSTALLATION DRAWING NMCS 2
MOTORWAY SIGNALS MK3 AND MESSAGE SIGNS
GANTRY SIGN SETTING OUT AND OPTICAL ALIGNMENT

SURVEY DATA SHEET Refer to Drawing MCX 0069 Sheet 5 of 7

Surveyed	Signed _____	Name _____	Date ___/___/___	Site No _____					
Checked	Signed _____	Name _____	Date ___/___/___	Marker Ref No _____					
RING APPROPRIATE DIMENSION OR INSERT NEW FIGURE									
Gantry Type	Standard SERO		Standard DOT		Others				
No of Span	Single	Twin	Single						
Girder Type	Truss	Truss	UB	Truss					
Span Length(m)	23/25/27/ 29/31	33/35	23/25	19	21	23	27	29	31/33/ 35
O/A Girder Depth(mm)	1412	1712	1412	610	618	1412			
Outstands of Channels/UB Flange(mm)	76.2			305	307	76.2	89		
Gantry Post Size (mm x mm)	300x300	350x350	300x300	300x200	400x200	350x350	398x356		
Fixed Sign Height(mm)	_____		Total Length of Fixed Sign(m)	_____		X(m) (see note 1) _____			
Stiffeners position in relation to the centre line of signal									
					NOTE : All dimensions to filled in and member sizes/type added to sketch.				
Type & Positions of any other obstructions in relation to signal support									
Any other Comments									

Note 1 : X(m)=Distance of outer edge of fixed sign to centre of gantry leg.

E	ADDRESS & LOGO REVISED COPYRIGHT NOTICE REMOVED	DWE 02.02
D	DRG TITLE REVISED REVISION AREAS MARKED	AW 8.99
C	UPDATED TO SUIT MK3 MOTORWAY SIGNALS FROM MK2	KRL 17.9.98
B	NEW DRAWING BLANK	DWE 7.97
A	INITIAL ISSUE PREVIOUS DRG. NO. MCX 0586	PM 18/7/94
F	HA ADDRESS REPLACED BY HIGHWAY CONSTRUCTION DETAILS	DWE 02.06
ISSUE	AMENDMENTS	APPD/DATE
DRN	M.L	CHKD RJG
DATE	OCT 93	DATE OCT 93
DRG. NO.	MCX 0069	
		SHT. NO. 7 of 7

MCX 0070 – 0130
NOT USED