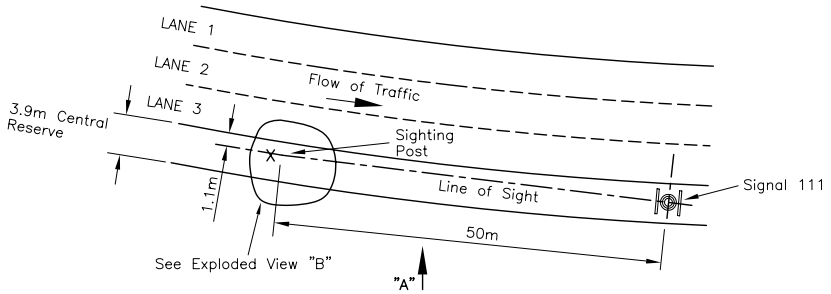
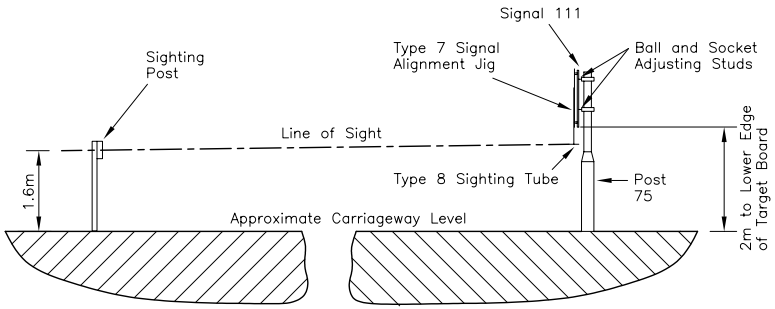
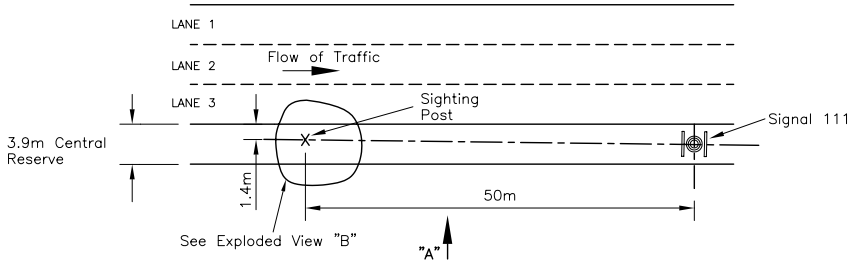
MCX 0000 – 0068
NOT USED



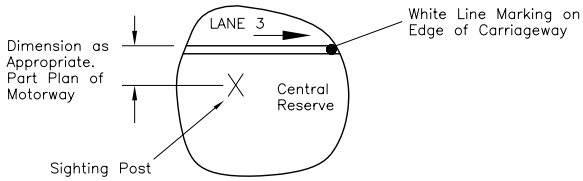
PART PLAN OF MOTORWAY
(CARRIAGEWAY CURVING AWAY FROM LANE 3)



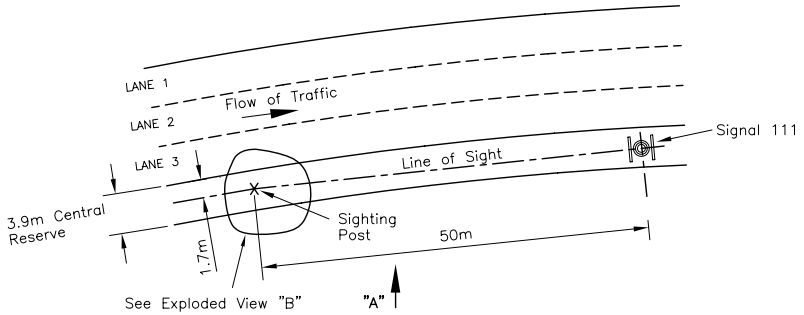
VIEW ON ARROW 'A'



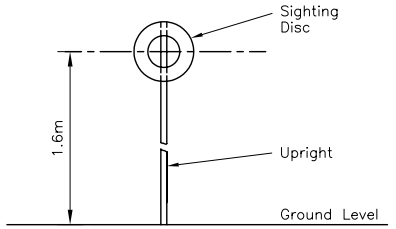
PART PLAN OF MOTORWAY
(STRAIGHT CARRIAGEWAY)



DETAIL 'B'



PART PLAN OF MOTORWAY
(CARRIAGEWAY CURVING TOWARD LANE 3)



Material: Aluminium Alloy
Finish: Sight Disc painted Bright Orange

DETAILS OF SIGHTING POST TYPE 9

ISSUE	AMENDMENTS	APPD/DATE
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

REV. H

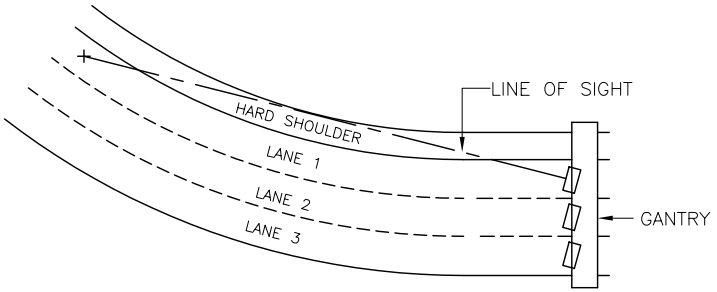
This drawing was generated on computer and must not be manually updated

HIGHWAY CONSTRUCTION DETAILS

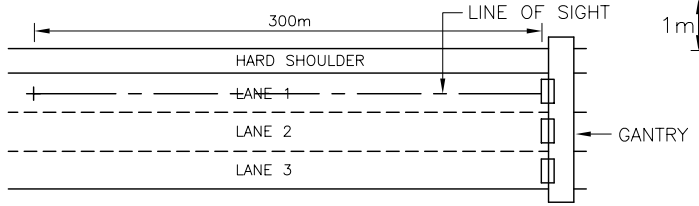
TITLE INSTALLATION DRAWING NMCS 1 & 2
SIGNAL ALIGNMENT & SIGHTING POST DETAILS
(ALIGNMENT OF MOTORWAY MATRIX INDICATORS – POST MOUNTED)

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

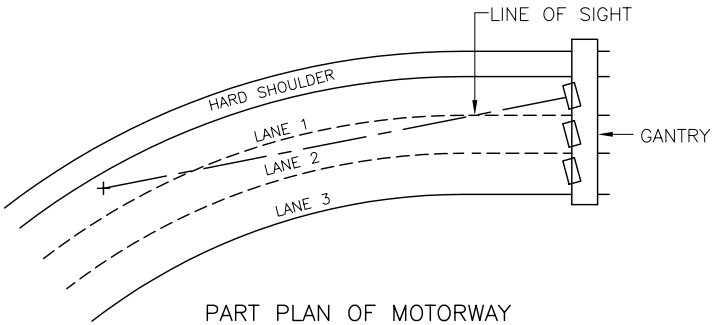
DRN PJS 15.6.94 CHKD DJM 17.6.94
DRG. NO. MCX 0069
SCALE NTS
SHT. NO. 1 of 7



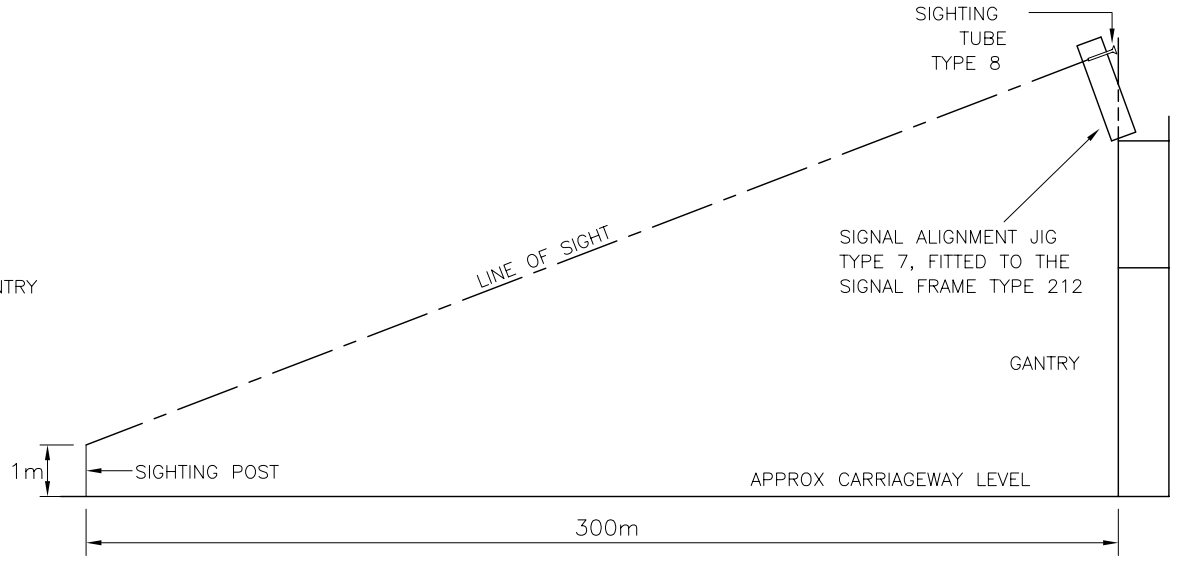
PART PLAN OF MOTORWAY
(LEFT HAND BEND APPROACHING GANTRY)



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.

ISSUE	AMENDMENTS	APPD/DATE
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

REV. F

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

HIGHWAY CONSTRUCTION DETAILS

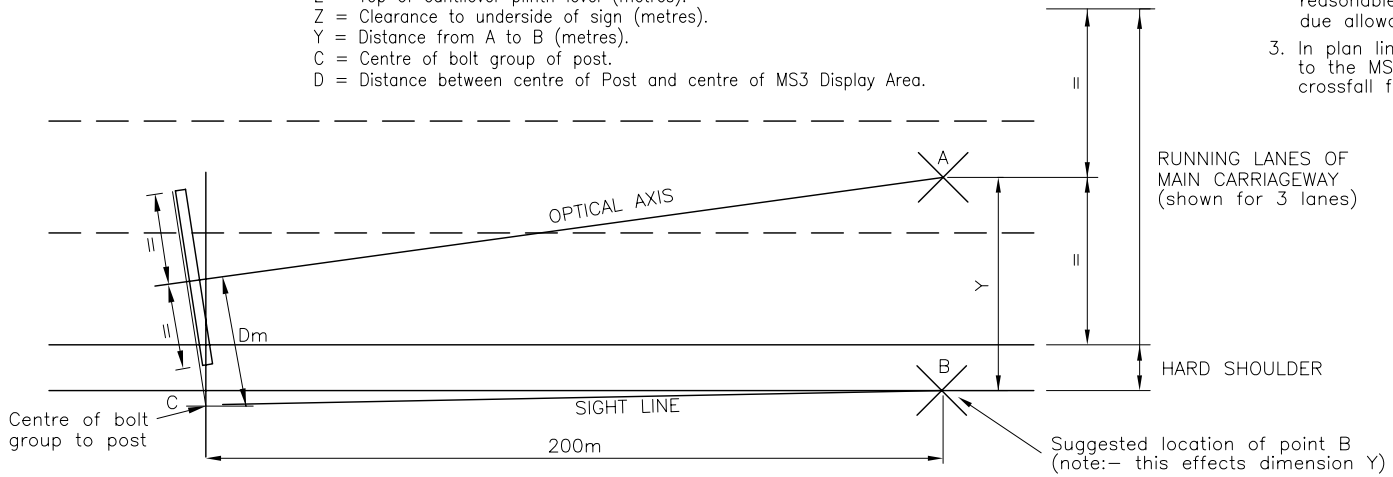
TITLE
INSTALLATION DRAWING NMCS 1 & 2
GANTRY SIGNAL INDICATOR ALIGNMENT DETAILS

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

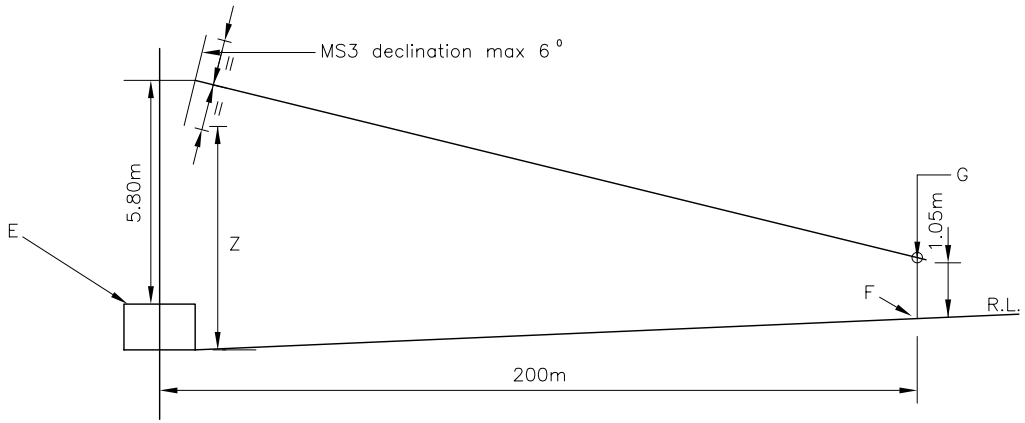
DRN E.E.D DATE 1.11.93
CHKD D. OWEN DATE 19.11.93
DRG. NO. MCX 0069
SCALE NTS
SHT. NO. 2 of 7

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.

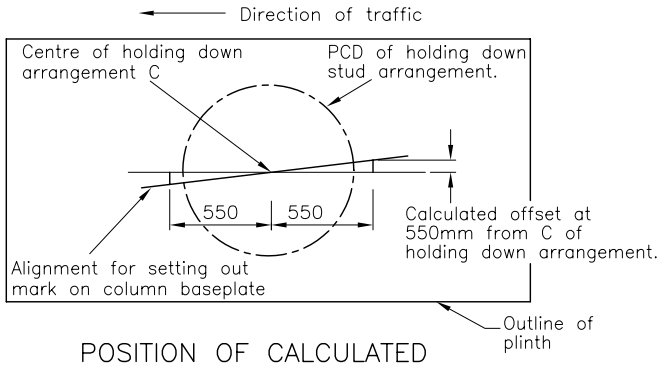


TYPICAL PLAN ON ALIGNMENT ARRANGEMENT



Offset from vertical in 1m 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

ISSUE	AMENDMENTS	APPD/DATE
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

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
ALL DIMENSIONS ARE IN MM
TOLERANCE ±1 UNLESS OTHERWISE STATED
THIRD ANGLE PROJECTION DO NOT SCALE

DRN M.A.P DATE FEB 92 | CHKD I.D.R DATE JUNE 92
DRG. NO. MCX 0069
SCALE NTS
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.	Number of running lanes ① 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 Calculate **'OFFSET'** = 550 x (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	m 5.800 m m
6.	Take level **F** of surface at **Point B** . Crossfall of carriageway (Estimated/measured/from drawing)*[%] Y @ Crossfall (+ = fall towards hardshoulder). Add height of driver's eye. = Level of driver's eye. ⑤	m m 1.050 m m
7.	Angular tilt of signal forwards $\text{Tan}^{-1}((④ - ⑤) \div 200)$. ⑥	deg.
8.	Offset in vertical in one metre height of signal. Tan (⑥ x 1000).	mm

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

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

ISSUE	AMENDMENTS	APPD/DATE
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

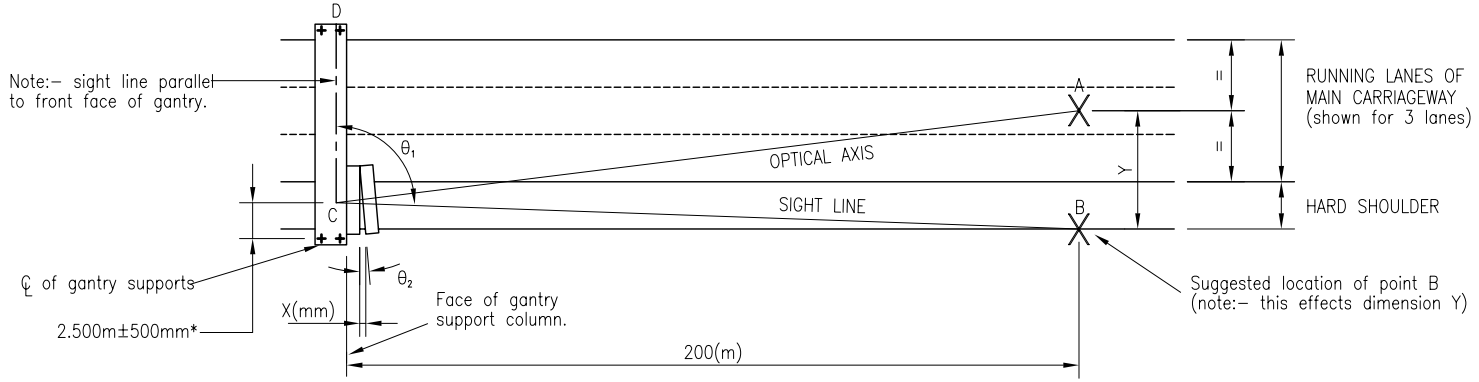
HIGHWAY CONSTRUCTION DETAILS

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 ± UNLESS OTHERWISE STATED
THIRD ANGLE PROJECTION DO NOT SCALE

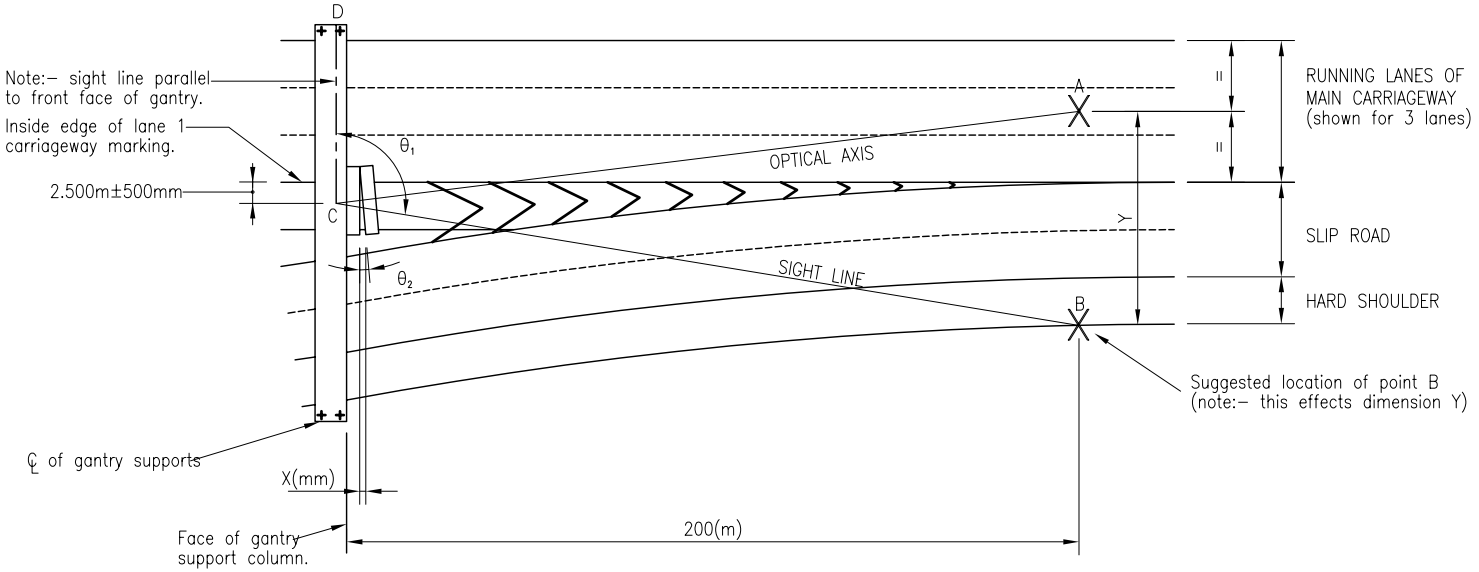
DRN M.L DATE OCT 93 | CHKD RJG DATE OCT 93 | SCALE NTS

DRG. NO. MCX 0069 | SHT. NO. 4 of 7



*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.

ISSUE	AMENDMENTS	APPD/DATE
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

REV. F

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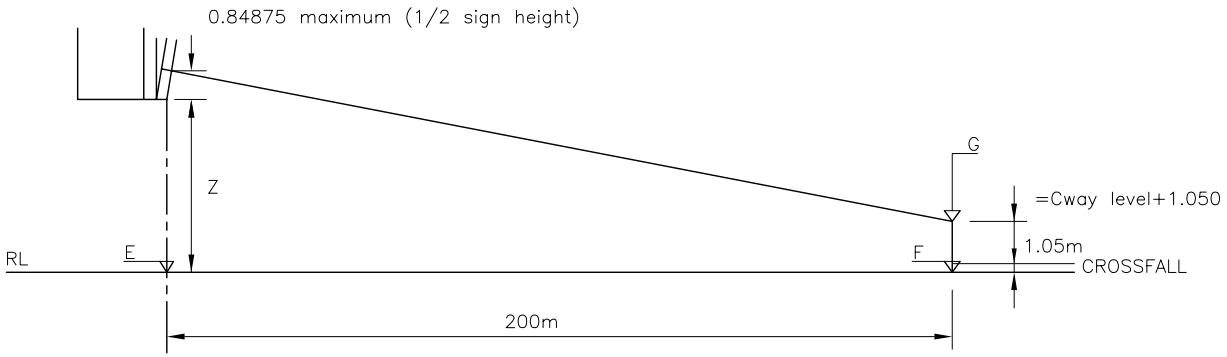
HIGHWAY CONSTRUCTION DETAILS

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

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
SCALE NTS
DRG. NO. MCX 0069
SHT. NO. 5 of 7



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

   $X = 3800 \sin \theta_2$ (in mm)

Vertical Offset

3. Offset from vertical in 1m height of sign

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

ISSUE	AMENDMENTS	APPD/DATE
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

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
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 G.W CHKD RJG
DATE OCT 93 DATE DEC 93
SCALE NTS
DRG. NO. MCX 0069
SHT. NO. 6 of 7

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.	Number of running lanes ① 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	mm
4.	Establish **Point D** on a transverse member at far end of gantry ④ 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 ⑤	° ′ ″ ° ′ ″ ° ′ ″ ° ′ ″
6.	$\theta_2 = 90 - ⑤ + \text{Tan}^{-1}(Y - 200)$	° ′ ″
7.	$X = 3800 \text{ Sin } \theta_1$	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. ⑥	m m m m
9.	Take level **F** of surface at **Point B**. Crossfall of carriageway (Estimated/measured/from drawing)*[%] **Y** @ Crossfall (+ = fall towards hardshoulder). Add height of driver's eye. 1.050 = Level of driver's eye. ⑦	m m m m
10.	Angular tilt of sign forwards $\text{Tan}^{-1}((⑥ - ⑦) - 200)$. ⑧	deg.
11.	Offset in vertical in one metre height of signal. Tan (⑧ x1000).	mm

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

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

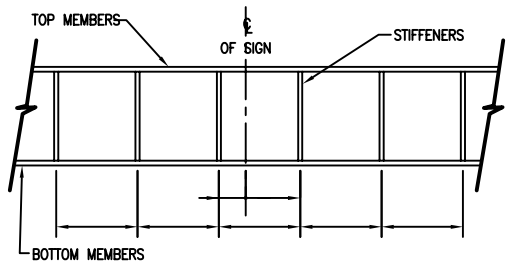
Surveyed Signed _____ Name _____ Date __/__/__ Site No ____
Checked Signed _____ Name _____ Date __/__/__ Marker Ref No ____

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.

ISSUE	AMENDMENTS	APPD/DATE
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

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
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.L DATE OCT 93 | CHKD RJG DATE OCT 93 | SCALE NTS
DRG. NO. MCX 0069 | SHT. NO. 7 of 7

MCX 0070 – 0130
NOT USED