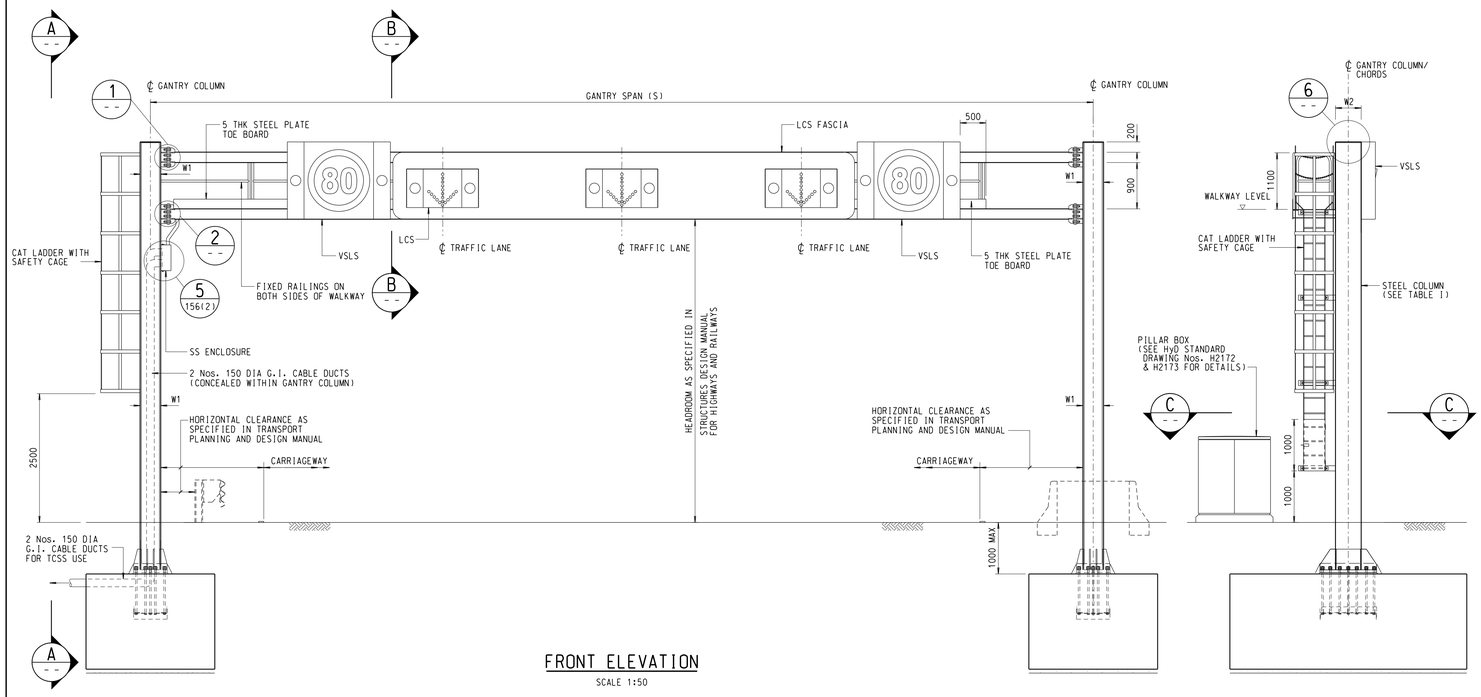


FRONT ELEVATION

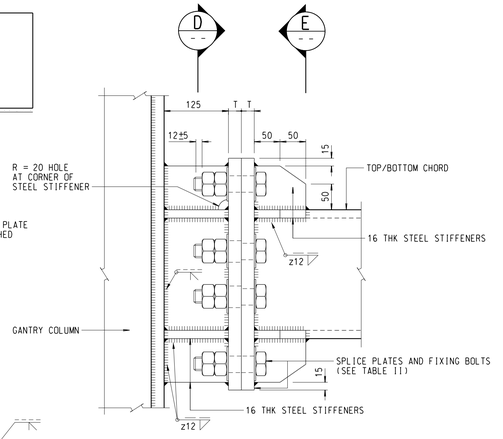
SCALE 1:50

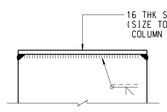
SECTION B

SCALE 1:20

ELEVATION A

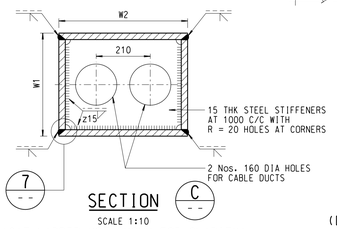
SCALE 1:50





DETAIL 6

SCALE 1:10



SECTION C

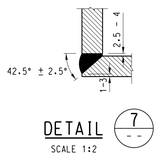
SCALE 1:10

(CAT LADDER NOT SHOWN FOR CLARITY)

DETAIL 1

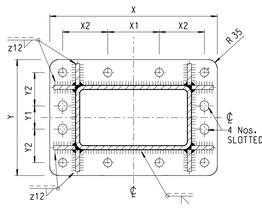
SCALE 1:5

(DETAIL 2 SIMILAR)



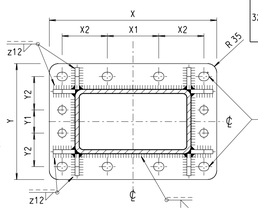
DETAIL 7

SCALE 1:2



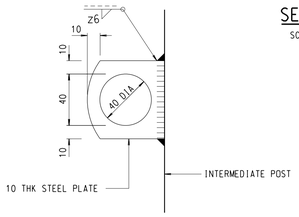
SECTION D

SCALE 1:10



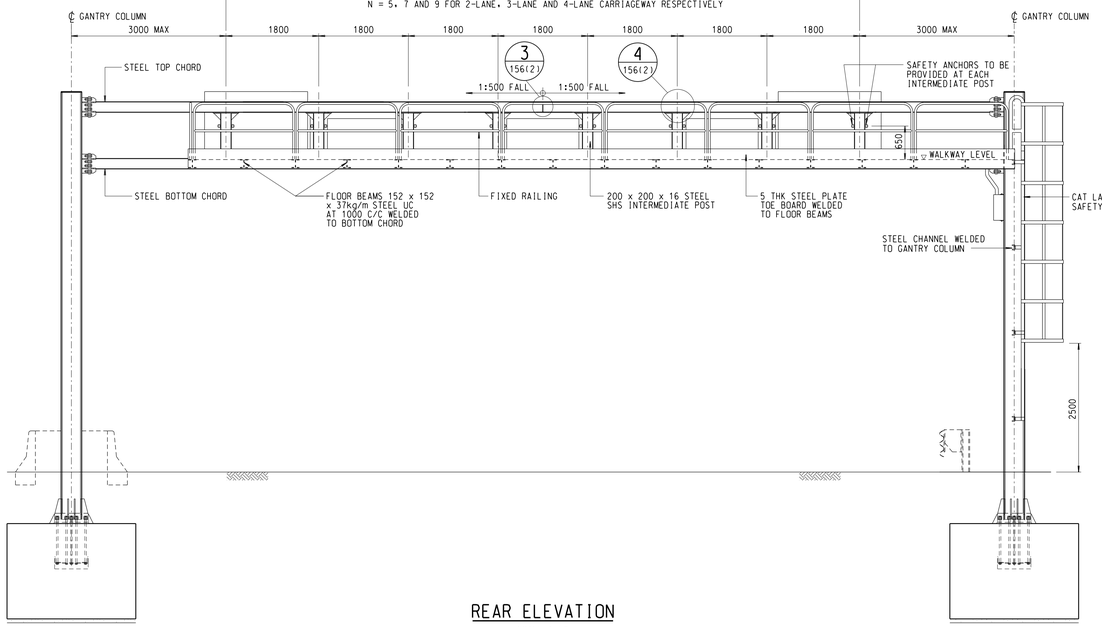
SECTION E

SCALE 1:10



TYPICAL DETAIL OF SAFETY ANCHOR

SCALE 1:2



REAR ELEVATION

SCALE 1:50

TABLE I - GANTRY FRAME SCHEDULE

GANTRY SPAN (S) (mm)	COLUMN (W1 x W2 x THK)	TOP & BOTTOM CHORD MEMBER (W3 x W4 x THK)	FLANGE PLATE OF INTERMEDIATE POST (W5 x W6 x THK)
S ≤ 13000	300 x 500 x 20	300 x 200 x 16 RHS	500x270x16
13000 < S ≤ 17000	300 x 500 x 25	400 x 200 x 16 RHS	500x370x20
17000 < S ≤ 22000	400 x 500 x 25	450 x 250 x 16 RHS	550x420x25

TABLE II - GANTRY TRUSS FRAME DETAILS

GANTRY SPAN (S) (mm)	SPLICE FIXING BOLTS					SPLICE CONNECTION PLATE			SLOTTED HOLE	
	SIZE	X1 (mm)	X2 (mm)	Y1 (mm)	Y2 (mm)	X (mm)	Y (mm)	T (mm)	HOLE A	HOLE B
S ≤ 13000	M30	150	125	80	110	500	400	20	33x40	40x33
13000 < S ≤ 17000	M30	200	150	80	110	600	400	25	33x40	40x33
17000 < S ≤ 22000	M30	200	175	90	130	650	450	25	33x40	40x33

ABBREVIATIONS

℄	CENTRE-LINE	No.	NUMBER
C/C	CENTRE TO CENTRE	Nos.	NUMBERS
CHS	CIRCULAR HOLLOW SECTION	R	RADIUS
DIA	DIAMETER	RHS	RECTANGULAR HOLLOW SECTION
DRG.	DRAWING	SHS	SQUARE HOLLOW SECTION
FVMS	FULLY VARIABLE MESSAGE SIGN	SS	STAINLESS STEEL
PVMS	PRISMATIC VARIABLE MESSAGE SIGN	SQ.	SQUARE
VSLS	VARIABLE SPEED LIMIT SIGN	TCSS	TRAFFIC CONTROL AND SURVEILLANCE SYSTEM
EQ.	EQUAL	THK	THICK
G.I.	GALVANIZED IRON	UB	UNIVERSAL BEAM
HyD	HIGHWAYS DEPARTMENT	UC	UNIVERSAL COLUMN
LCS	LANE CONTROL SIGNAL	UPVC	UNPLASTICIZED POLYVINYL CHLORIDE
MAX	MAXIMUM	<	LESS THAN
MIN	MINIMUM	≤	LESS THAN OR EQUAL TO

NOTES:

1. THE WORKS SHALL COMPLY WITH THE LATEST EDITION OF GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS, UNLESS OTHERWISE SPECIFIED.
2. THE STRUCTURAL DESIGN OF THE GANTRY IS BASED ON THE STRUCTURES DESIGN MANUAL FOR HIGHWAYS AND RAILWAYS (2013) WITH A WIND PRESSURE OF 3.3kN/m².
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
4. ALL STRUCTURAL STEEL SECTIONS SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS AS APPROPRIATE: -

BS EN 10210-2	FOR HOLLOW SECTIONS
BS 4-1 & BS EN 10034	FOR I- SECTIONS
BS EN 10056-1&2	FOR ANGLES
BS EN 10029 CLASS A	FOR STEEL PLATES

5. ALL STRUCTURAL STEEL SECTIONS SHALL BE HOT ROLLED OR HOT FINISHED. COLD FORMED OR HEAT TREATED SECTIONS SHALL NOT BE ACCEPTED UNLESS OTHERWISE SPECIFIED.
6. ALL STEELWORK GRADE, UNLESS OTHERWISE STATED, SHALL BE: - S355J2H TO BS EN 10210 FOR HOLLOW SECTIONS S355J2 TO BS EN 10025 FOR OTHER SECTIONS AND PLATES.
7. WELDING SHALL COMPLY WITH THE REQUIREMENTS OF BS EN 1011. WELDING CONSUMABLES SHALL COMPLY WITH BS EN 13479 AND THE APPROPRIATE PRODUCT STANDARDS LISTED IN TABLE 5 OF BS EN 1090-2. ELECTRODES FOR WELDING SHALL BE COMPATIBLE WITH AND WITH MINIMUM YIELD STRENGTH, MINIMUM TENSILE STRENGTH, MINIMUM ELONGATION AND CHARPY ENERGY VALUE EQUAL TO OR BETTER THAN THE CORRESPONDING VALUES SPECIFIED FOR THE STEELWORK TO BE WELDED.
8. WELDING SYMBOLS ARE IN ACCORDANCE WITH SYSTEM 'A' OF BS EN ISO 2553.
9. FILLET WELDS SHALL BE OF MINIMUM 6mm LEG LENGTH UNLESS OTHERWISE SPECIFIED.
10. ALL CONNECTIONS SHALL BE FULL STRENGTH BUTT WELDS UNLESS OTHERWISE STATED. BUTT WELDS SHALL BE FULL PENETRATION WELDS PRODUCED BY METHODS APPROVED BY THE ENGINEER UPON SATISFACTORY COMPLETION OF PROCEDURE TRIALS.
11. SITE WELDS SHALL BE KEPT TO A MINIMUM AND SHALL ONLY BE PERMITTED WITH THE PRIOR WRITTEN APPROVAL BY THE ENGINEER.
12. WIRE WOOL AND WIRE BRUSHES USED TO CLEAN SURFACES BOTH BEFORE AND AFTER WELDING SHALL BE STAINLESS STEEL. ALL EXPOSED BUTT JOINTS SHALL BE GROUND SMOOTH AND BUFFED. THE DIRECTION OF GRINDING SHALL FOLLOW THE GRAIN PATTERN.
13. ALL STEEL COMPONENTS SHALL BE HOT-DIP GALVANIZED TO BS EN ISO 1461 AFTER FABRICATION BY SPECIALIST CONTRACTOR IN THE "CLASS V: HOT DIP GALVANIZING" OF THE "SPECIALIZED OPERATIONS FOR HIGHWAY STRUCTURES" CATEGORY OF THE LIST OF APPROVED SUPPLIERS OF MATERIALS AND SPECIALIST CONTRACTORS FOR PUBLIC WORKS.
14. POSITION OF GALVANIZING VENT HOLES SHALL BE AGREED WITH THE GALVANIZER AND SUBJECT TO THE APPROVAL BY THE ENGINEER.
15. WHERE MEMBERS ARE TOO LARGE FOR AVAILABLE GALVANIZING BATHS, SUB-ASSEMBLIES SHALL BE PREPARED AS ABOVE AND SUBSEQUENTLY WELDED JOINTS SHALL BE ZINC SPRAYED IN ACCORDANCE WITH BS EN ISO 2063 TO A MINIMUM THICKNESS OF 0.2mm. TWO COATS OF GOOD QUALITY ZINC-RICH PAINT COMPLYING WITH BS 4652 SHALL THEN BE APPLIED ACROSS THE ENTIRE ZINC SPRAYED AREAS INCLUDING AT LEAST 25mm OF THE PARENT GALVANIZED COATING, OR AT THE DISCRETION OF THE ENGINEER, BY THE USE OF LOW MELTING POINT ZINC ALLOY REPAIR RODS MADE SPECIFICALLY FOR THIS PURPOSE RESULTING IN A MINIMUM COATING THICKNESS OF 0.2mm. ANY DAMAGE OF GALVANIZED COATINGS SHALL BE MADE GOOD IN A SIMILAR WAY TO THE TREATMENT OF WELDED JOINTS.
16. BEFORE FABRICATION OF THE STEELWORK, THE CONTRACTOR SHALL SUBMIT A FULL-SET OF WORKSHOP DRAWINGS, TOGETHER WITH DETAILS OF HIS PROPOSED METHOD OF HANDLING, TRANSPORTATION AND ERECTION TO THE ENGINEER FOR HIS APPROVAL.
17. UNLESS OTHERWISE STATED, FASTENERS FOR BOLT CONNECTIONS BETWEEN STEELWORK SHALL BE ISO METRIC PRECISION HEXAGONAL BOLTS AND NUTS TO BS 3692 WITH COMPATIBLE WASHERS. EACH FASTENER SHALL BE COMPLETED WITH EITHER A LOCKING NUT OR SPRING WASHER. THE STRENGTH GRADE OF THE BOLTS SHALL BE 8.8.
18. UNLESS OTHERWISE STATED, FASTENERS FOR HOLDING DOWN AND FIXING ARRANGEMENTS OF SIGN GANTRIES AND FOR ALUMINIUM COMPONENTS SHALL BE GRADE A4-80 STAINLESS STEEL BOLTS AND NUTS TO BS EN ISO 3506-1 AND BS EN ISO 3506-2, WITH COMPATIBLE STAINLESS STEEL WASHERS. NYLON OR OTHER APPROVED NON-METALLIC WASHERS SHALL BE PROVIDED BETWEEN THE SURFACES OF ANY DIFFERENT METALS SUCH AS ALUMINIUM ALLOY, STAINLESS STEEL AND GALVANIZED STEEL.
19. UNLESS OTHERWISE STATED, DIAMETER OF BOLT HOLES SHALL BE AS FOLLOWS: 2mm LARGER THAN THE NOMINAL DIAMETER OF THE BOLT DIAMETER FOR BOLTS WITH NOMINAL DIAMETER < 27mm; 3mm LARGER THAN THE NOMINAL DIAMETER OF THE BOLT DIAMETER FOR BOLTS WITH NOMINAL DIAMETER ≥ 27mm.
20. MATERIAL AND WORKMANSHIP SHALL COMPLY WITH BS 5400: PART 6.
21. THE STEELWORK SHALL BE PAINTED IN COLOURS AS SPECIFIED BY THE ENGINEER. WITH PAINT SYSTEMS COMPLYING WITH THE REQUIREMENTS STIPULATED IN CLAUSE 16.4 OF THE STRUCTURES DESIGN MANUAL FOR HIGHWAYS AND RAILWAYS.
22. THE STEEL SURFACE TO BE PAINTED SHALL BE THOROUGHLY CLEANED AND PREPARED, FREE FROM GREASE, DIRT, SCALE AND RUST, AND OTHER SURFACE CONTAMINANTS INCLUDING MILL SCALE AND SLAG. THE CONTRACTOR SHALL SUBMIT THE PROPOSED METHOD STATEMENT FOR STEEL SURFACE PREPARATION WORKS TO THE ENGINEER FOR APPROVAL PRIOR TO THE COMMENCEMENT OF PAINTING WORKS.
23. THE CONTRACTOR SHALL DESIGN AND MAKE NECESSARY PRECAMBER TO THE SIGN GANTRY TO ENSURE THAT IT IS CONSTRUCTED TO THE REQUIRED LEVEL OR ALIGNMENT.
24. CONCRETE GRADE, UNLESS OTHERWISE STATED, SHALL BE AS FOLLOWS : 40/20D FOR ALL CONCRETE EXCEPT BLINDING LAYER 10/20D FOR BLINDING LAYER
25. CAT LADDER SHALL BE INSTALLED IF PROPER LANDING ADJACENT TO GANTRY COLUMN IS AVAILABLE. THE ENGINEER OR THE PROJECT PROPONENT SHALL SPECIFY IN THE CONTRACT WHETHER CAT LADDER SHALL BE PROVIDED.
26. THE MATERIAL USED FOR THE CONSTRUCTION OF LADDERS, HOOPS AND CONNECTIONS OF CAT LADDERS SHALL BE GRADE S275J0 STEEL TO BS EN 10025 GALVANIZED ACCORDING TO NOTES 13 TO 15 AND PAINTED ACCORDING TO NOTE 21.
27. PILLAR BOX SHALL BE INSTALLED AT AN ACCESSIBLE LOCATION AS CLOSE TO THE GANTRY COLUMN AS POSSIBLE SUBJECT TO THE APPROVAL BY THE ENGINEER. ADEQUATE CLEARANCE BETWEEN CAT LADDER AND PILLAR BOX SHALL BE PROVIDED TO FACILITATE INSPECTION AND MAINTENANCE.
28. THE FIXING DETAILS FOR E&M AND TCSS EQUIPMENT SHALL BE DESIGNED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER.
29. THE LANE CONTROL SIGNALS SHALL BE PLACED IN POSITIONS SUCH THAT THE SIGNALS SHALL PROJECT IN LINE WITH THE CENTRE LINES OF THE FINAL TRAFFIC LANES.
30. IN CASE THE SIZE/CONFIGURATION OF THE TCSS EQUIPMENT AND SIGNS TO BE INSTALLED ON THE GANTRY VARIES SIGNIFICANTLY FROM THOSE SHOWN ON THIS DRAWING, THE ENGINEER OR THE PROJECT PROPONENT SHALL VERIFY THE STRUCTURAL DESIGN OF THE GANTRY ACCORDINGLY, AND SHALL ALSO CRITICALLY EXAMINE WHETHER IT IS APPROPRIATE TO ADOPT THE MULTI-LAYER BACKING FRAME DESIGN SHOWN ON THIS DRAWING WITH DUE REGARD TO AESTHETIC ASPECT. POSSIBLE OPTIONS SUCH AS REDUCING THE NUMBER OF HORIZONTAL CHORD MEMBERS BY SUPPORTING THE SIGNS AT UPPER LEVELS WITH VERTICAL SIGN POSTS SHOULD BE CONSIDERED.
31. AFTER ERECTION OF GANTRY COLUMN TO FOUNDATION, 2 COATS OF BITUMINOUS PAINT OF MINIMUM 50µm SHALL BE APPLIED AROUND THE SECTION OF GANTRY COLUMN BASE IN CONTACT WITH SOIL UP TO 150mm ABOVE GROUND SURFACE/THE TOP OF CONCRETE PROFILE BARRIER ACCOMMODATING THE COLUMN. THE BITUMINOUS PAINT SHALL CONFORM TO CLAUSE 20.03 OF THE LATEST EDITION OF GENERAL SPECIFICATIONS FOR CIVIL ENGINEERING WORKS.
32. FINISHED GROUND SURFACE AROUND GANTRY COLUMN SHALL BE MADE TO MINIMUM 0.5% FALL OUTWARD.

no.	date	description	initial
B	11/16	DRAWING NOTES REVISED; CHORD SPLICE DETAIL AND INTERMEDIATE POST/CHORD CONNECTION DETAIL REVISED	SIGNED C.P.WONG, E/P2-3; SIGNED P.T. LEUNG, SE/P2
A	09/14	GENERAL REVISION OF DRAWING NOTES	SIGNED P.H.CHUNG, E/P2-1; SIGNED P.T. LEUNG, SE/P2

REVISION

		name	signature	date
	designed	K. S. LAM	SIGNED	04/11
	drawn	W. K. WOO	SIGNED	04/11
checked	senior technical officer	Y. W. CHIN	SIGNED	08/11
	project engineer	K. S. LAM	SIGNED	08/11
	senior engineer	P. T. LEUNG	SIGNED	08/11

approved

SIGNED — 05/08/2011 (date)

P. K. LEE
Chief Highway Engineer

contract no.

file no. STR 5/40/18

project no.

contract

drawing title

TRAFFIC CONTROL AND SURVEILLANCE SYSTEM
SIGN GANTRY TYPE A

FOR LANE CONTROL SIGNAL (WITH OPTIONAL VARIABLE SPEED LIMIT SIGN)

(SHEET 1 OF 3)

drawing no. SSD156(1)-B

scale AS SHOWN

office
BRIDGES AND STRUCTURES DIVISION 結構橋樑部及

HIGHWAYS DEPARTMENT 路政署 HONG KONG 香港

0 10 20 30 40 50 mm
1 : 1 SCALE BAR

B1 SIZE 1000 X 707mm