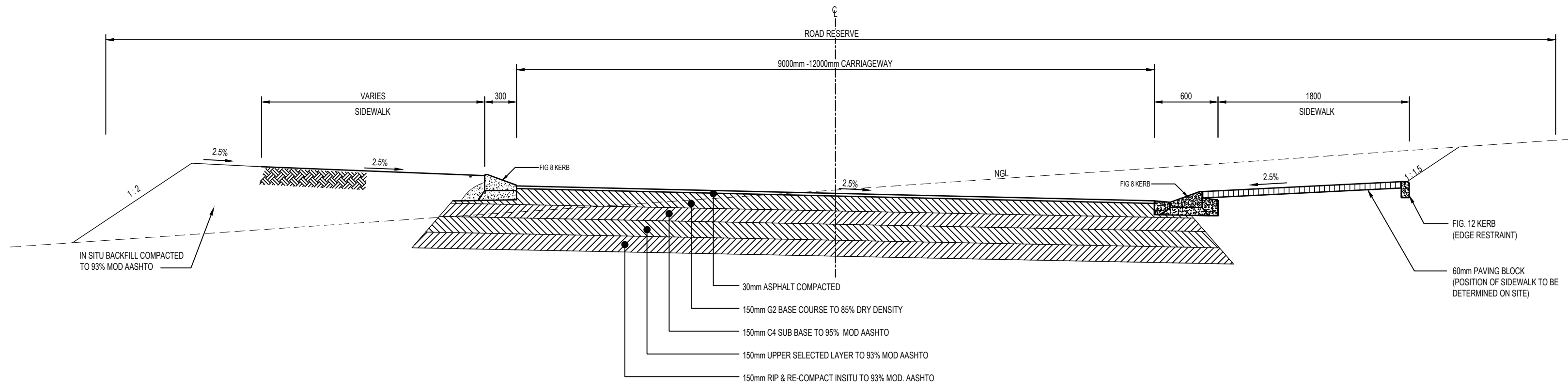
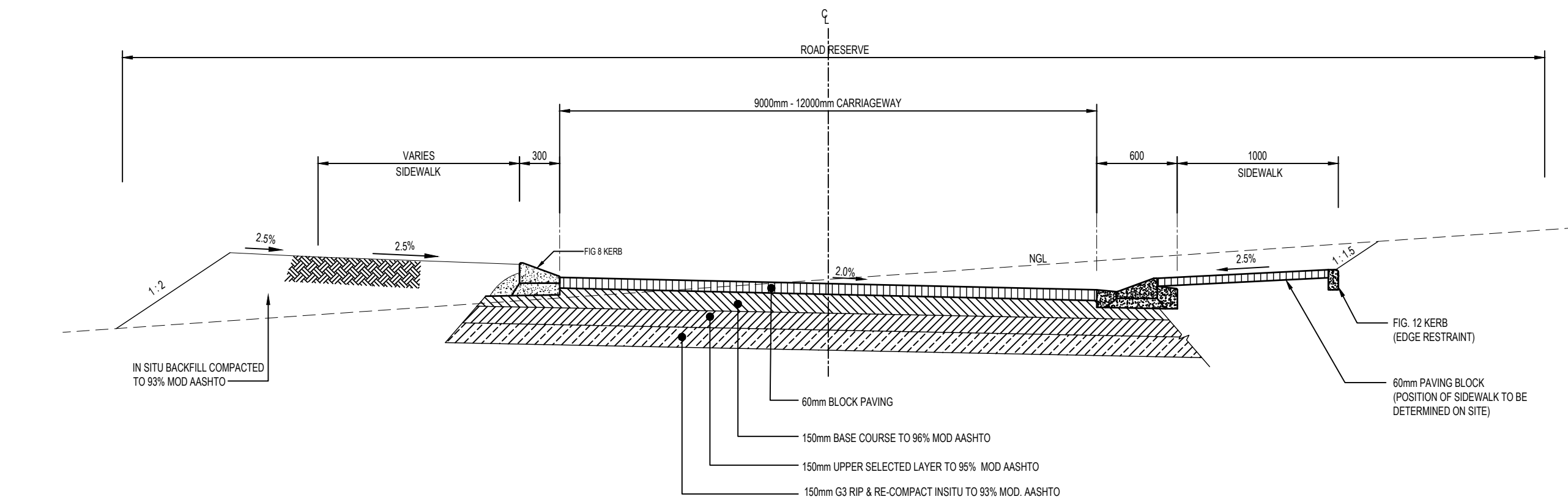
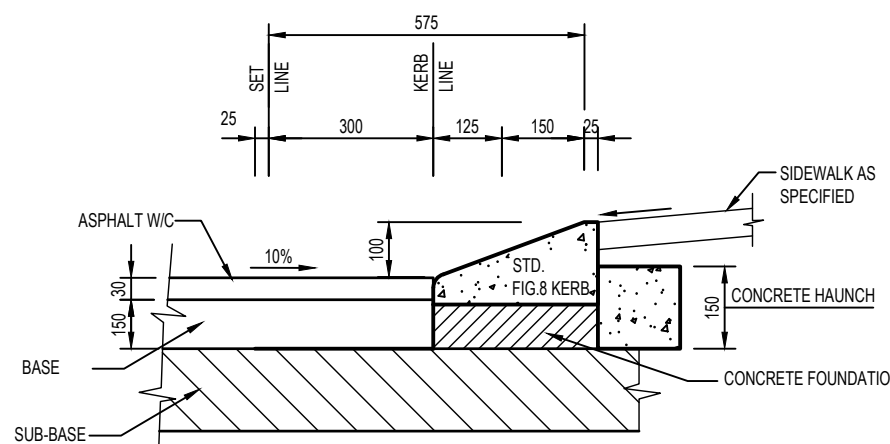




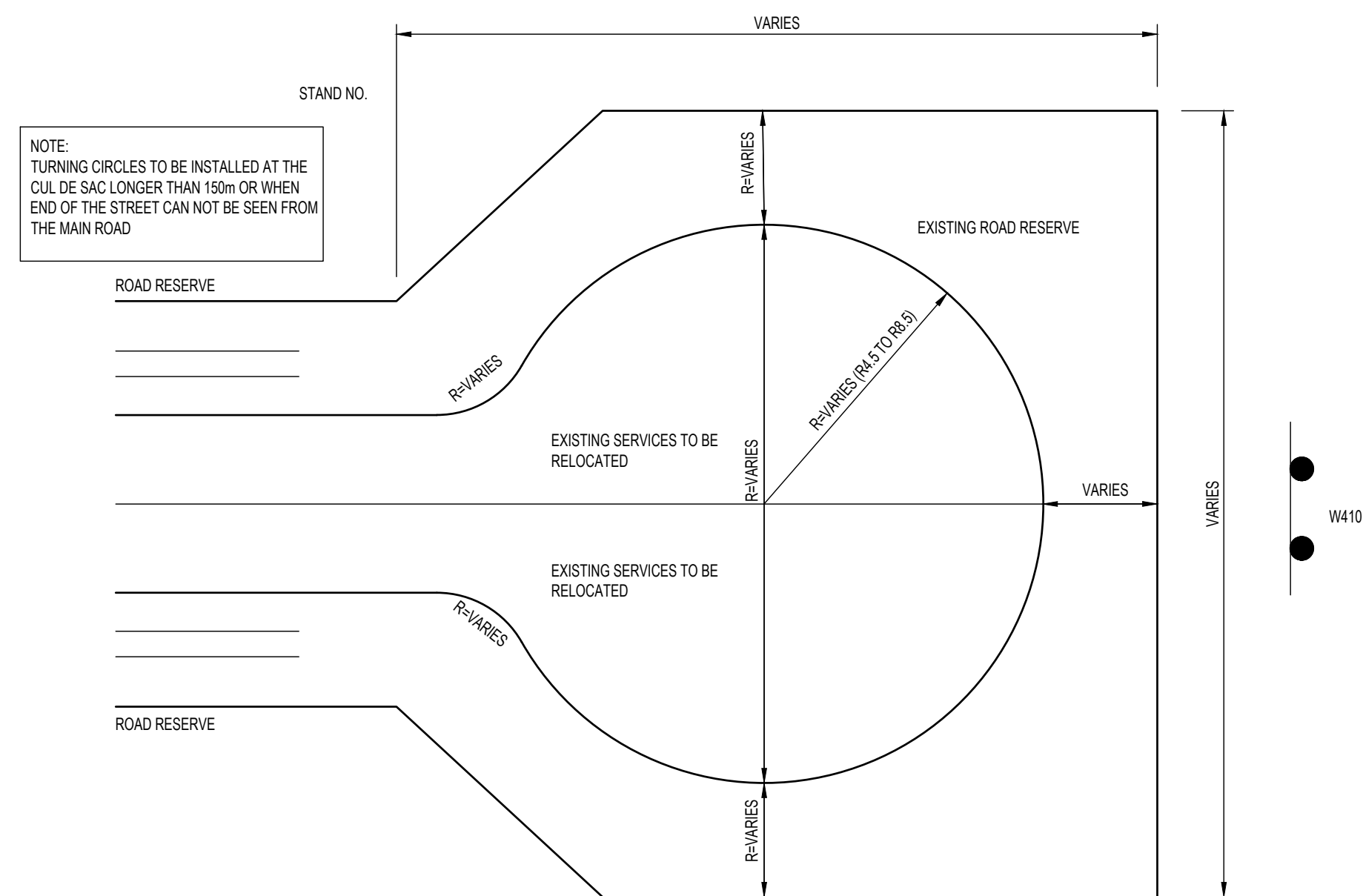
5m x 6m ROAD TYPICAL CROSS-SECTION
SCALE 1:25



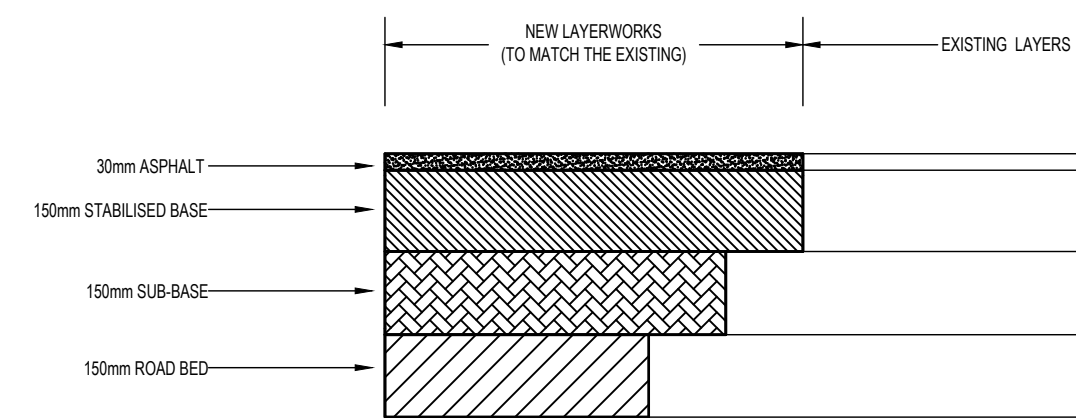
4m x 5m ROAD TYPICAL BLOCK PAVED CROSS-SECTION
SCALE 1:25



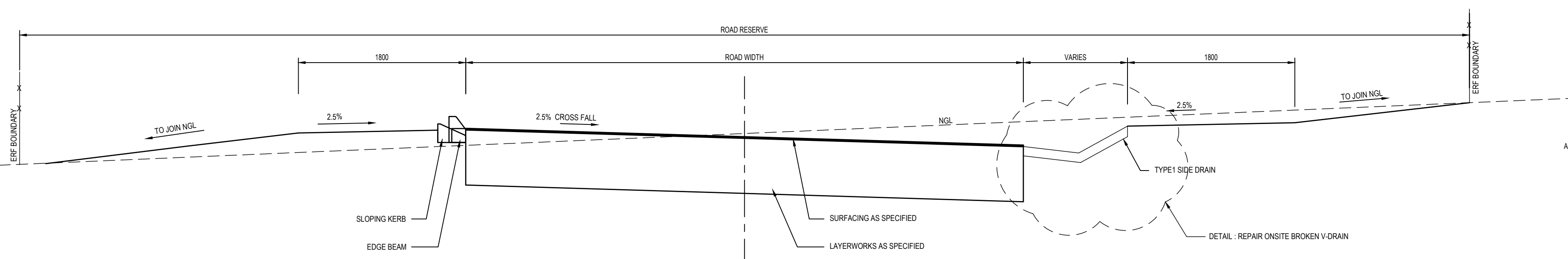
MOUNTABLE KERB AND CAST IN SITU CHANNEL
(CHANNEL SECTION SHOWN)
SCALE: 1:10



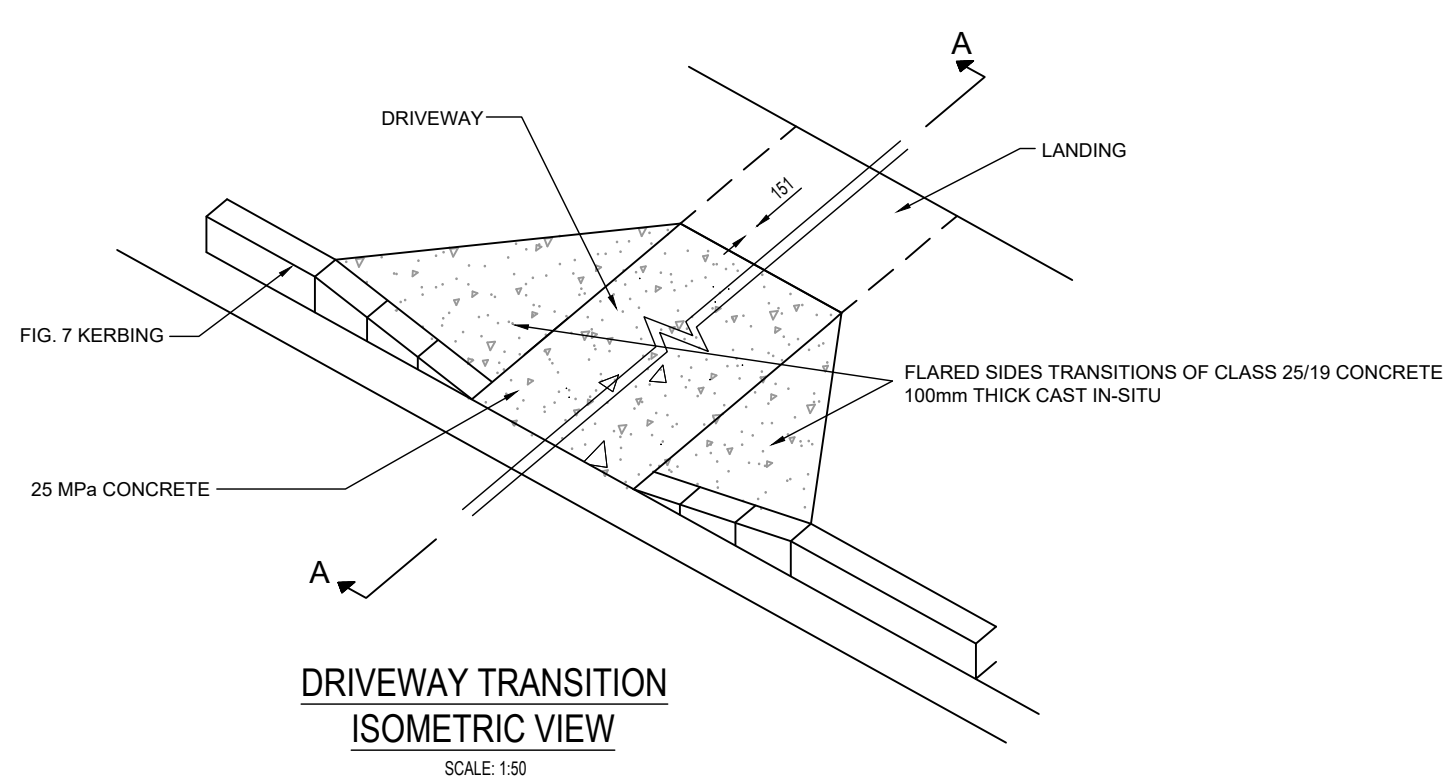
CUL DE SAC
SCALE 1:20



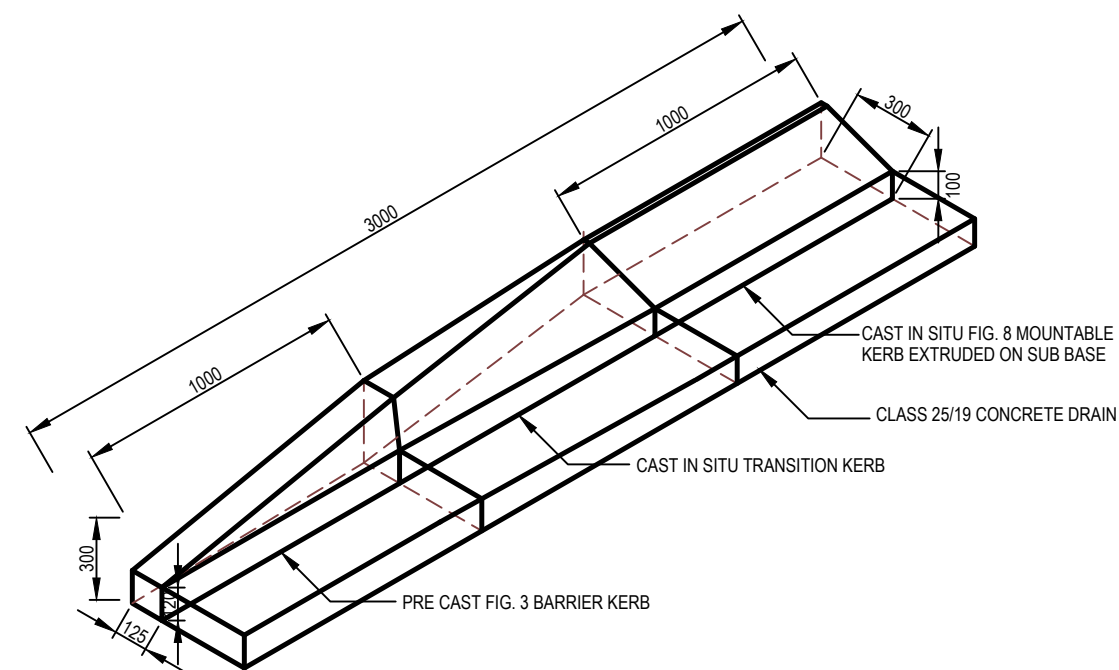
DETAIL OF NEW TO EXISTING ROAD JOINT
SCALE 1:10



TYPICAL ROAD SECTION WITH SIDE DRAIN
SCALE 1:25



DRIVEWAY TRANSITION
ISOMETRIC VIEW
SCALE 1:50



TRANSITION FROM BARRIER TO MOUNTABLE KERB
SCALE 1:50

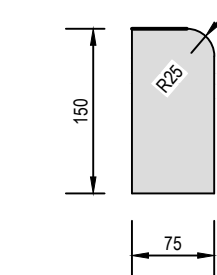


FIG.12 GARDEN KERB
SCALE 1:5

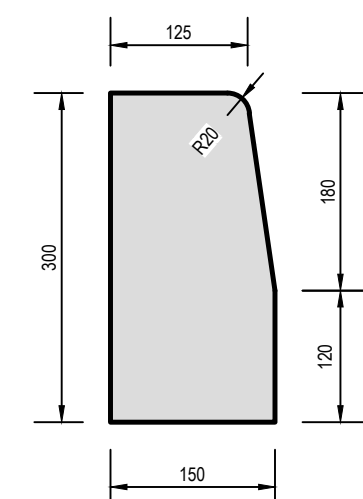
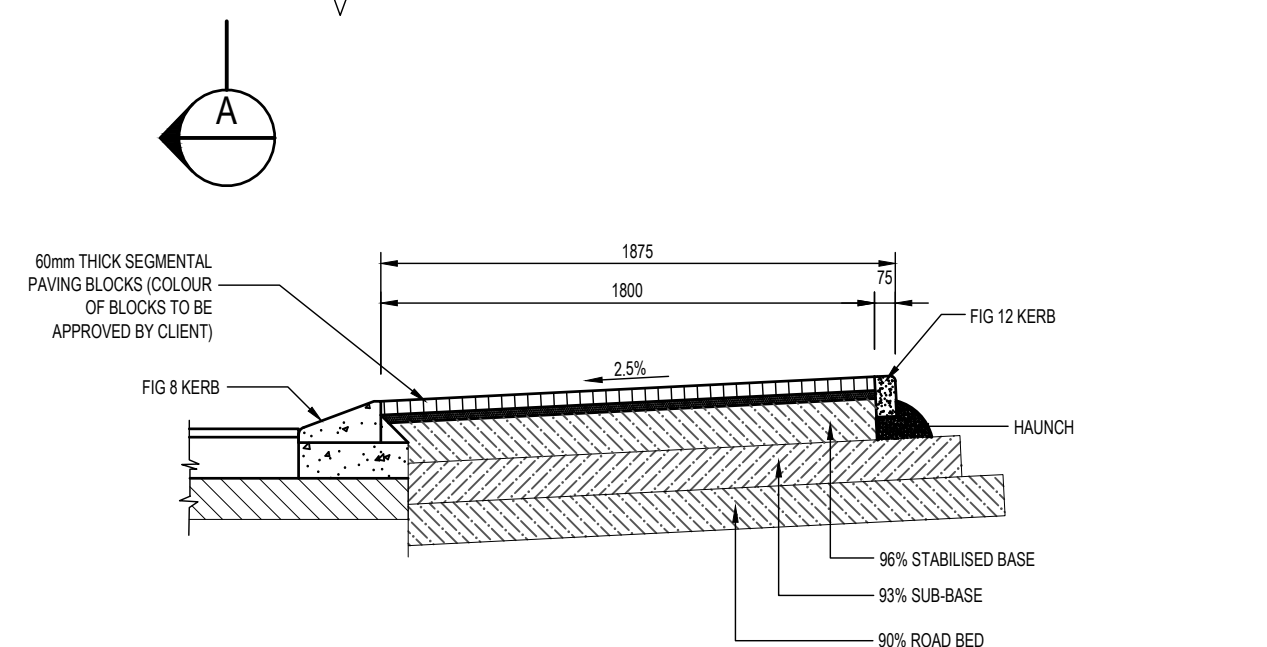
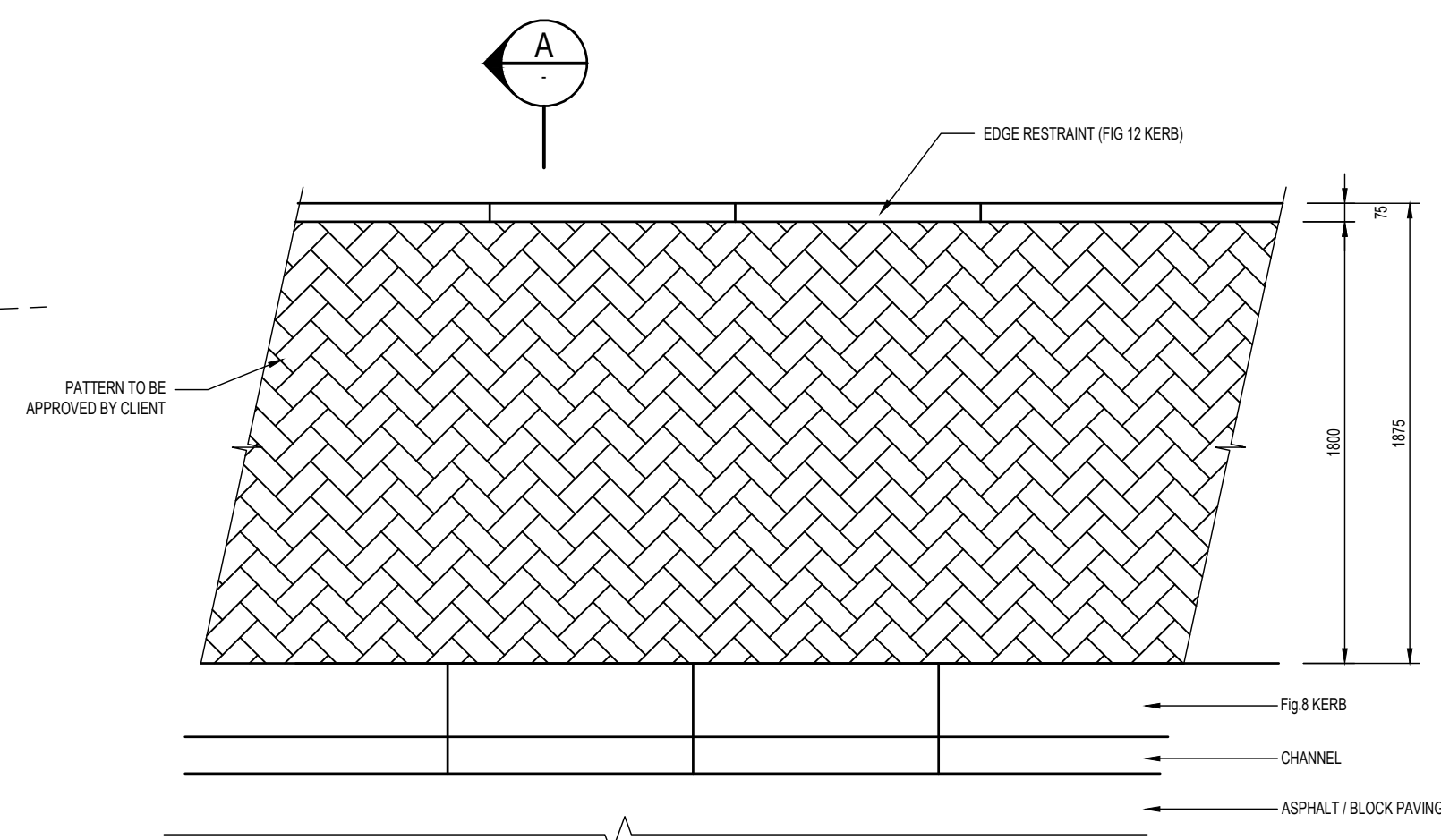


FIG.3 HALF BATTERED KERB
SCALE 1:5



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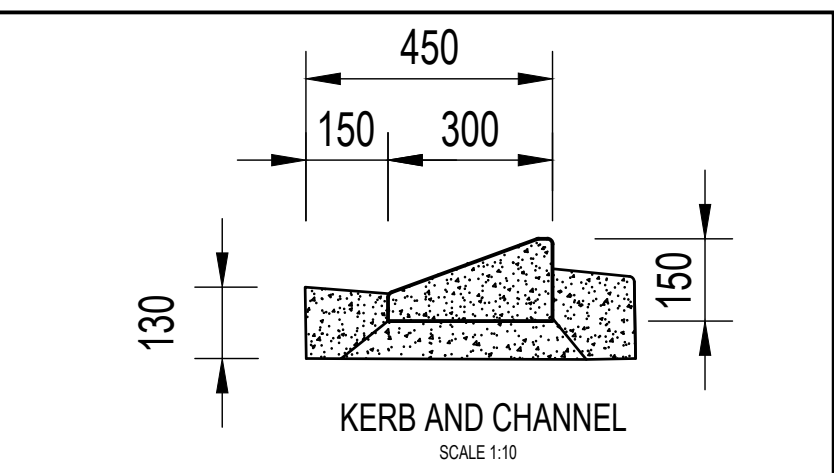
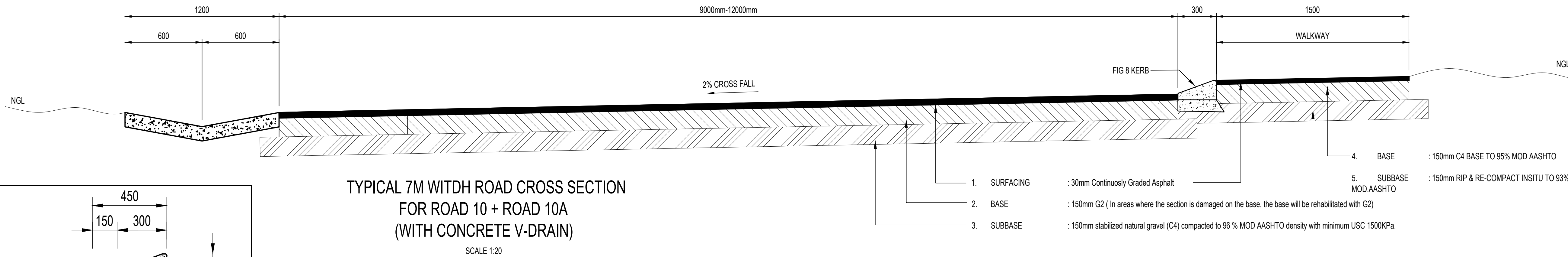
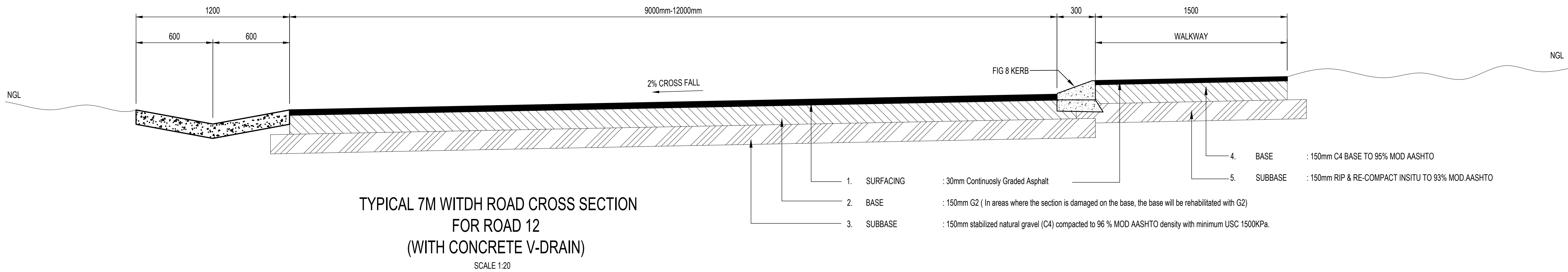
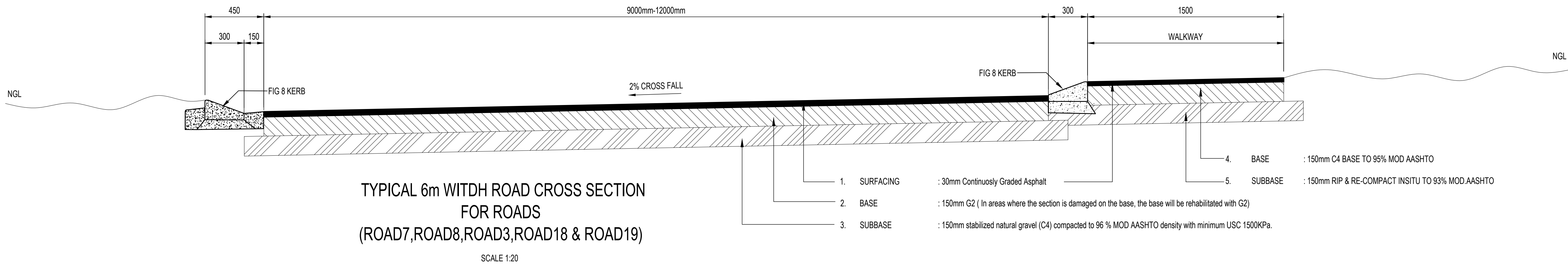
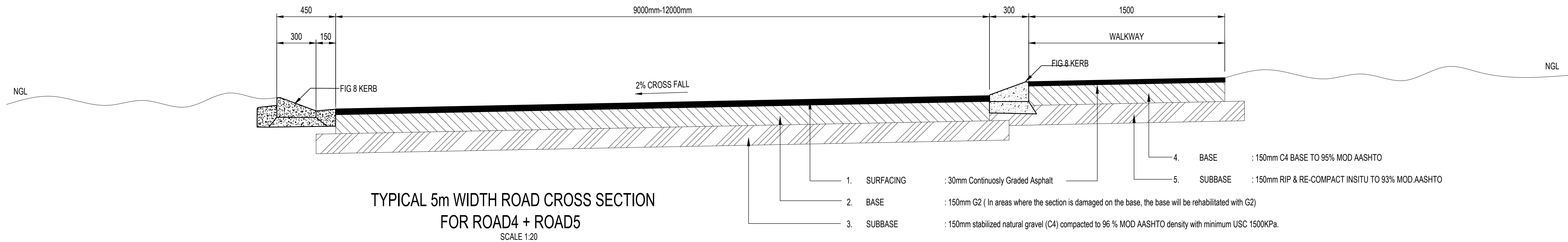
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CONDITION ASSESSMENT

ROAD CROSS SECTION AND
PAVEMENT DETAILS

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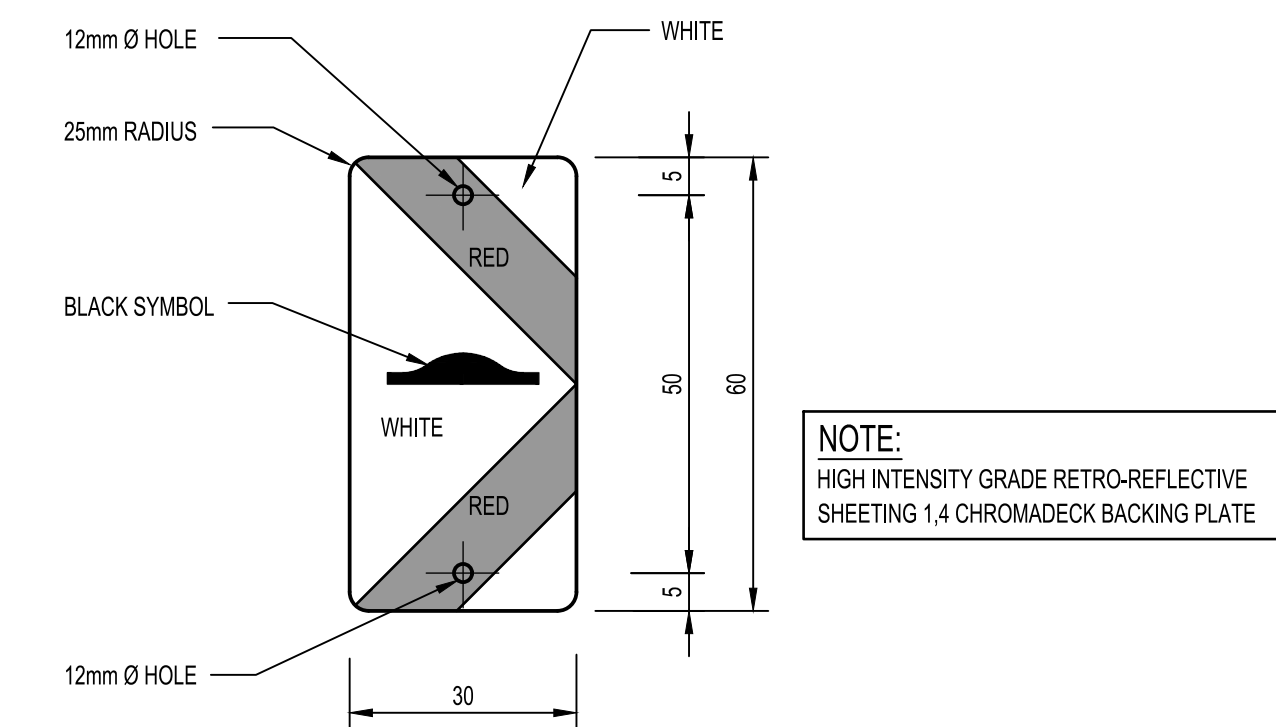
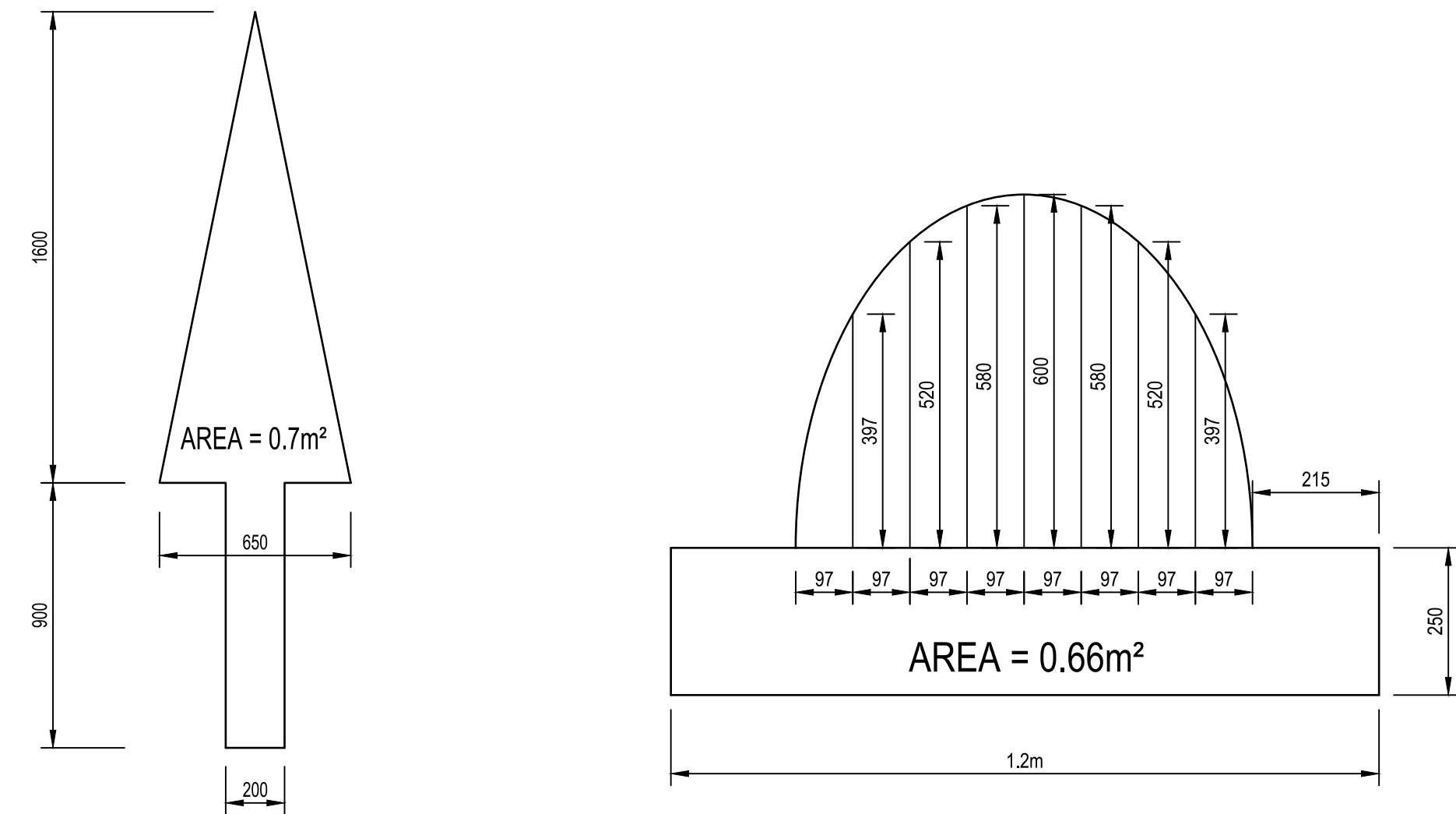
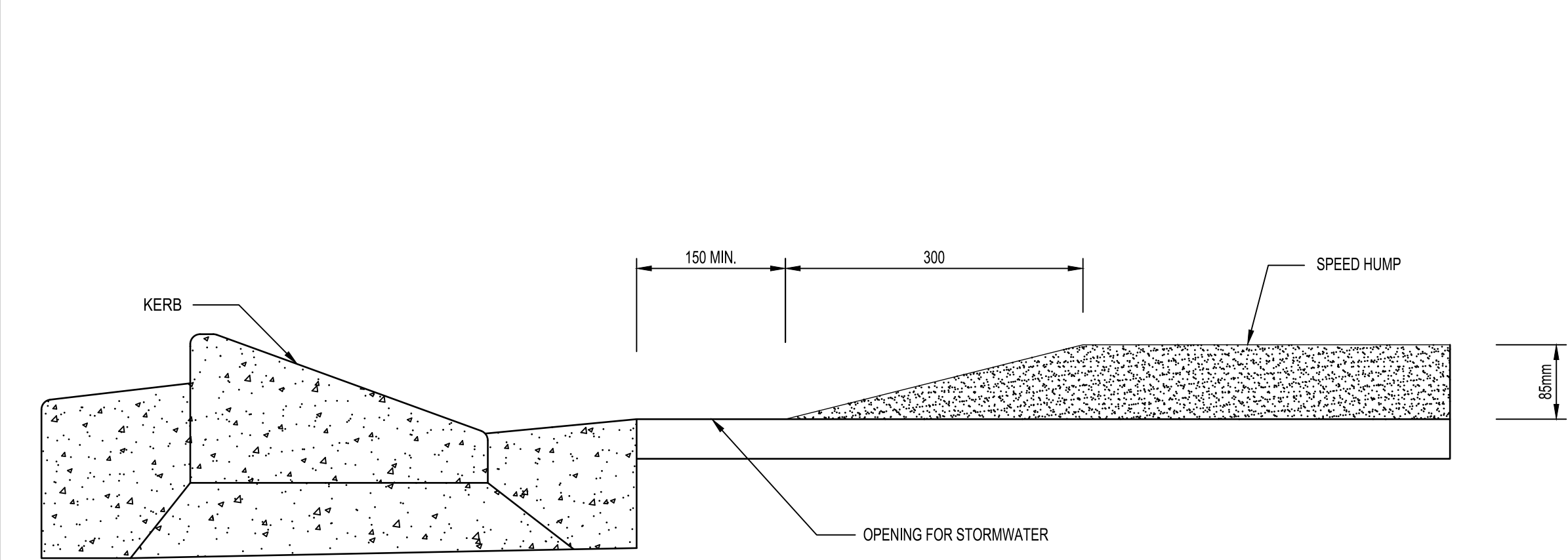
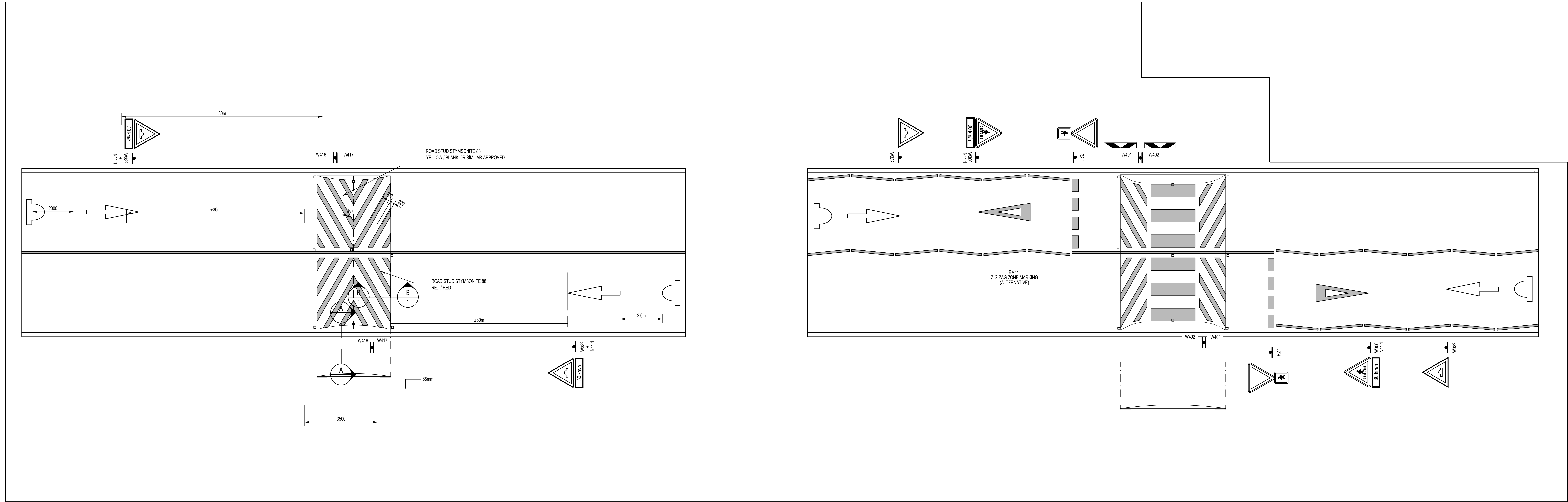


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CROSS SECTIONS

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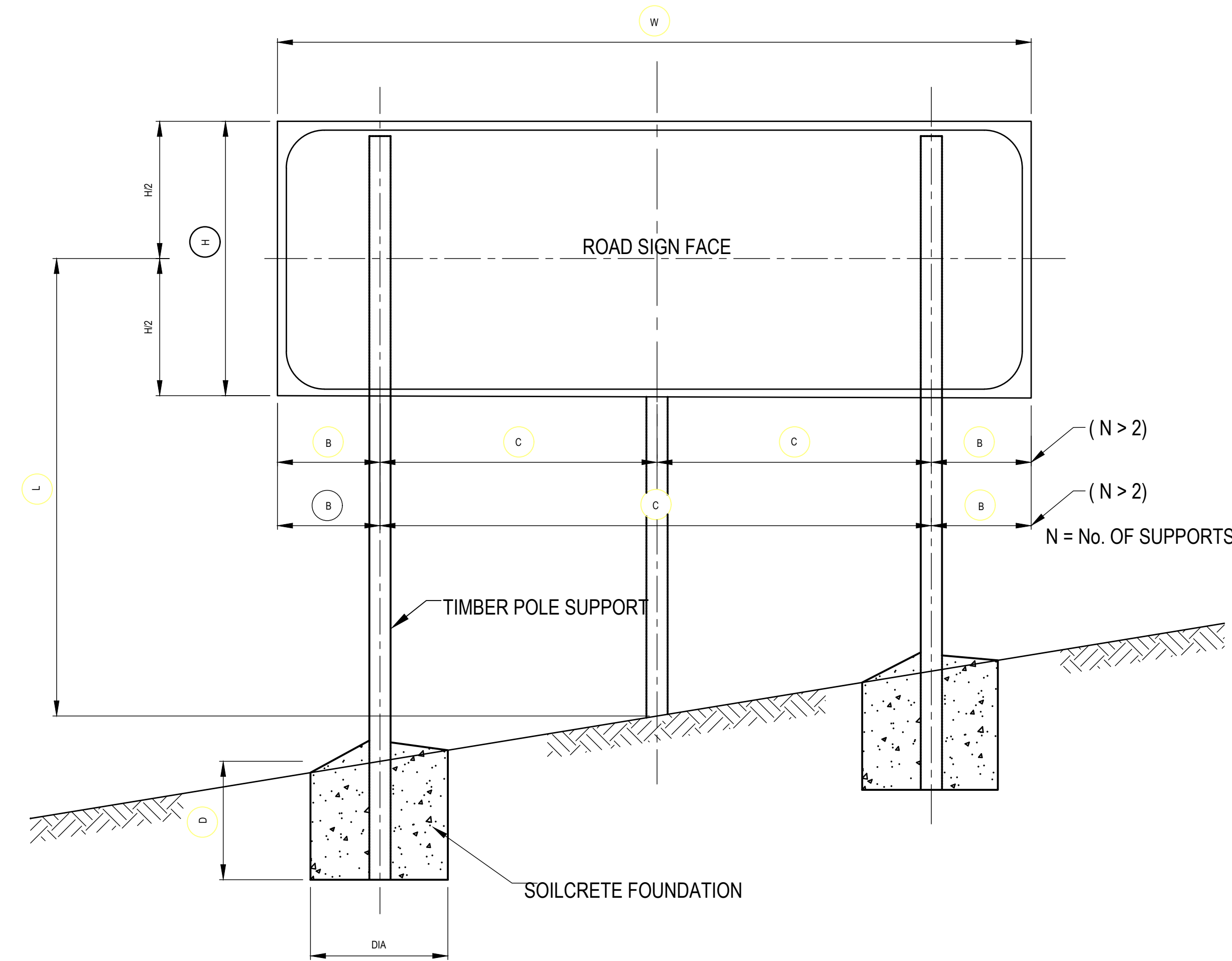


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WMMLM INFRASTRUCTURE & ROAD CONDITION ASSESSMENT

SPEED HUMP AND PEDESTRIAN CROSSING

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ELEVATION

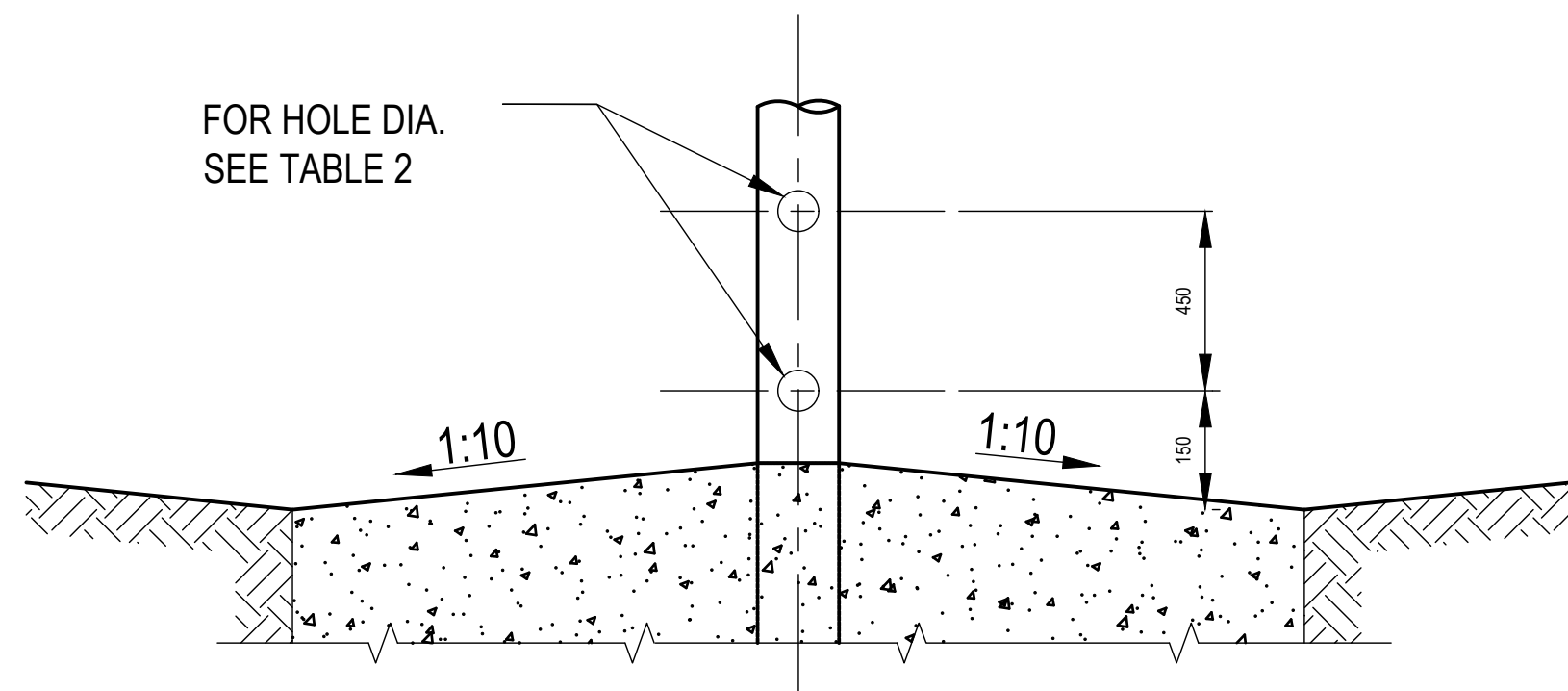
FREE STANDING SUPPORT

SCALE - N.T.S

TABLE 1

WIDTH OF SIGN	No. OF SUPPORTS	DIMENSIONS	
(W)	(N)	(B)	(C)
1,2m OR LESS	1	W/2	-
1,2m - 4,0m	2	W/5	3W/5
4,0m - 7,2m	3	W/2N	W/N
7,2m - 9,6m	4		
9,6m - 12,0m	5		

NOTE : MAXIMUM DISTANCE BETWEEN SUPPORTS = 2,4 m

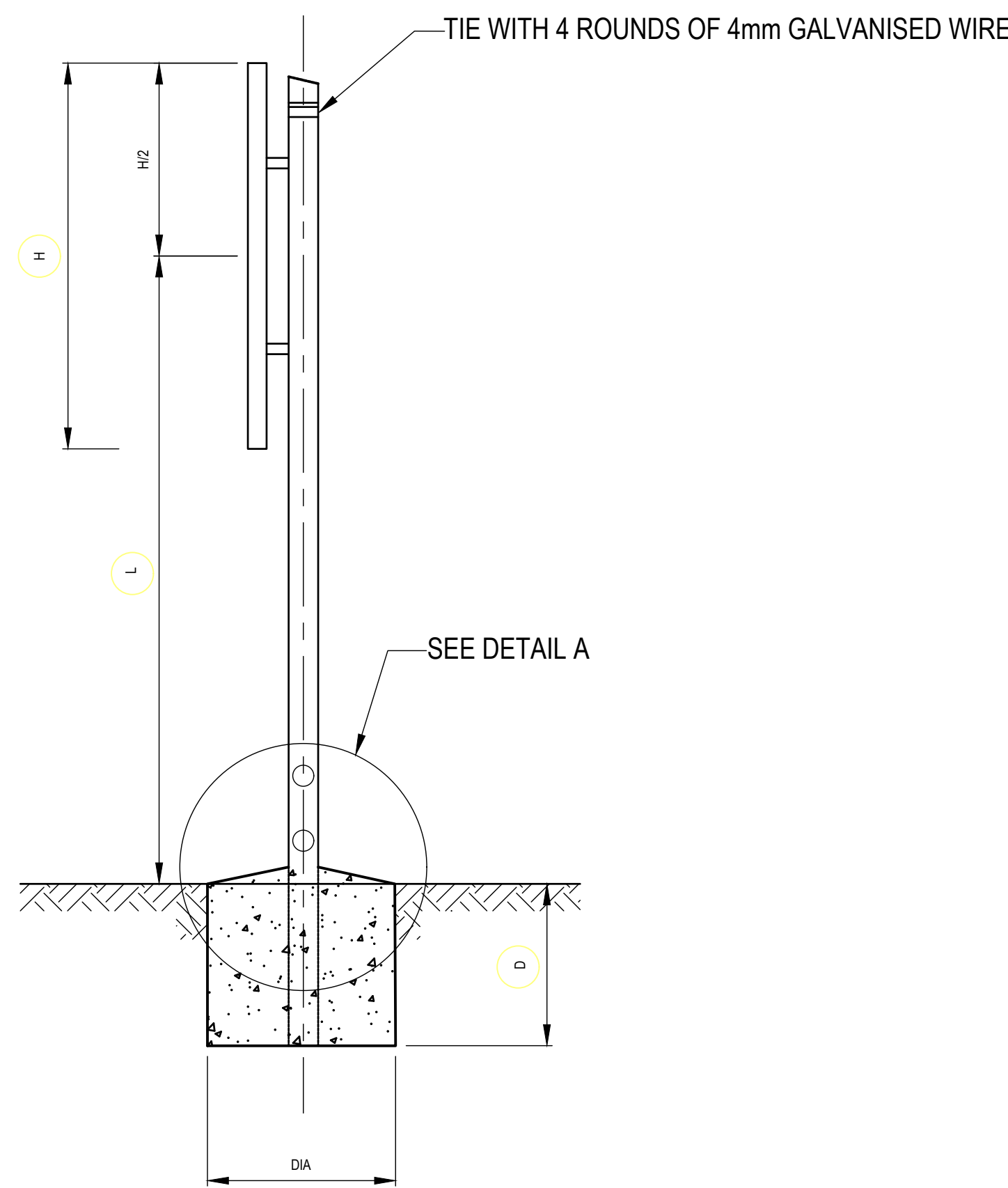


DETAIL A

SCALE - N.T.S

TABLE 2

TIMBER POLE DIA. AT GROUND LEVEL (mm)	HOLE DIA. (mm)
≤ 140	NONE
141 - 170	40
171 - 200	50
201 - 225	65



TYPICAL SECTION

GENERAL NOTES

POSITION

ROAD SIGNS SHALL BE ERECTED IN THE POSITIONS SHOWN ON THE DRAWINGS OR INDICATED BY THE ENGINEER. STANDARD CLEARANCES ARE SHOWN IN THE SADC ROAD TRAFFIC SIGNS MANUAL.

EXCAVATION

EXCAVATIONS FOR FOUNDATIONS MUST BE MADE TO THE NEAT DIMENSIONS SPECIFIED. WHERE THE FOUNDATION DEPTH IS 1,5m OR GREATER, EXCAVATIONS MUST BE SUITABLY SHORED FOR THE PROTECTION OF WORKMEN.

TIMBER POLE SUPPORTS

TIMBER SUPPORTS SHALL BE STRAIGHT ROUND POLES COMPLYING WITH THE REQUIREMENTS OF SANS 457-3 AND SHALL NOT EXHIBIT EXCESSIVE CRACKING AT THE ENDS

LENGTH:

WHEREVER POSSIBLE POLE LENGTHS CORRESPONDING TO AVAILABLE NOMINAL LENGTHS SHALL BE USED.

CUTTING:

WHERE CUTTING TO LENGTH AFTER PRESERVATIVE TREATMENT IS UNAVOIDABLE, ONLY ONE CUT PER POLE SHALL BE ALLOWED. THE CUT SHALL BE NEAR THE TOP END OF THE POLE AND THE EXPOSED SURFACE SHALL BE TREATED WITH TWO COATS OF THE APPLICABLE PRESERVATIVE AND THE POLE BANDED IN ACCORDANCE WITH SANS 457-3.

PRESERVATIVE TREATMENT:

THE POLES SHALL BE TREATED WITH EITHER A MIXTURE OF COPPER-CHROMIUM-ARSENIC COMPOUNDS COMPLYING WITH THE REQUIREMENTS OF TYPE II OF SANS 673 (HICKSONS "TANALITH C" OR EQUAL) OR WITH CREOSOTE THAT COMPLIES WITH SANS 538 OR SANS 539.

ERECTION:

POLES SHALL BE SELECTED FOR STRAIGHTNESS AND ERECTED AT AN ORIENTATION WHICH WILL PERMIT THE SIGN FACE TO BE FASTENED IN A VERTICAL PLANE WITHOUT UNDUE DISTORTION.

BREAKAWAY HOLES:

ALL TIMBER POLES HAVING A DIAMETER >140mm SHALL BE DRILLED WITH TWO HOLES PERPENDICULAR TO THE DIRECTION OF TRAFFIC AS SHOWN IN DETAIL A. THE EXPOSED TIMBER SURFACES SHALL BE TREATED WITH TWO COATS OF THE APPLICABLE PRESERVATIVE.

SOILCRETE FOUNDATIONS

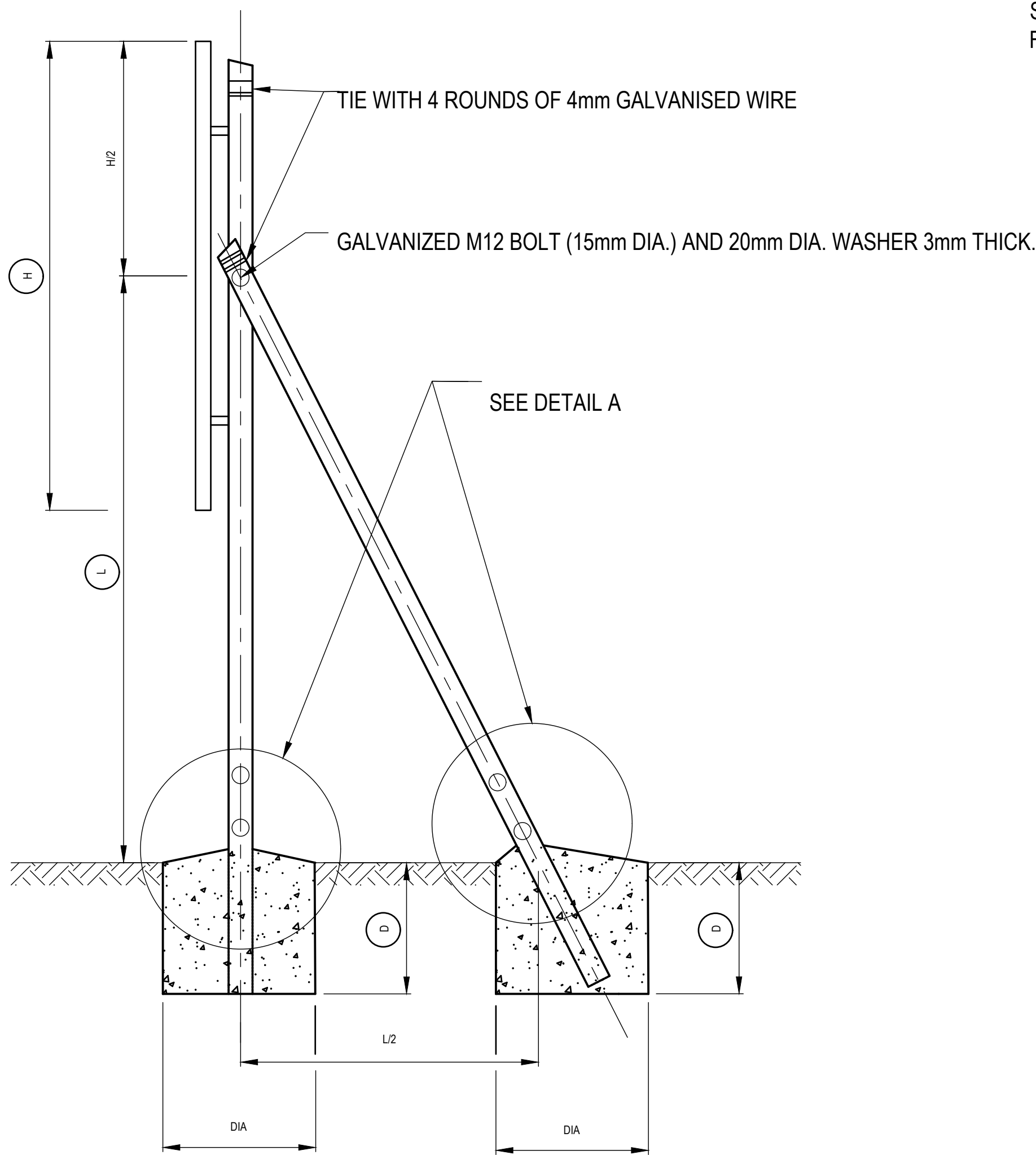
SOILCRETE SHALL CONSIST OF 12 PARTS APPROVED GRANULAR SOIL OR GRAVEL MIXED WITH 1 PART PORTLAND CEMENT AND ONLY SUFFICIENT WATER TO GIVE IT A CONSISTENCY THAT WILL PERMIT THE SOILCRETE TO BE VIBRATED OR TAMPED TO EXCLUDE VOIDS. TIMBER SUPPORT POLES SHALL BE SET VERTICAL AND FIRMLY PROPPED IN POSITION PRIOR TO PLACING OF THE SOILCRETE. PROPS SHALL REMAIN IN POSITION FOR A MINIMUM OF 12 HOURS AFTER PLACING THE SOILCRETE. THE SURFACE OF THE SOILCRETE SHALL BE NEATLY FINISHED WITH SUFFICIENT FALL TO ENSURE PROPER DRAINAGE. CONCRETE SHALL NOT BE SUBSTITUTED FOR SOILCRETE. TOPPING OF SOILCRETE FOUNDATION TO BE STEEL FLOATED.

BOLTS, NUTS AND WASHERS

EXCEPT WHERE OTHERWISE SPECIFIED STEEL BOLTS AND NUTS SHALL CONFORM TO SANS 135 OR SANS 1143 AND ALL COMPONENTS SHALL HAVE A HOT-DIP (GALVANIZED) ZINC COATING THAT COMPLIES WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999) FOR COATINGS ON TYPE C1 ARTICLES.

ROAD SIGN FACES

ROAD SIGN FACES SHALL BE MANUFACTURED STRICTLY IN ACCORDANCE WITH THE DETAILS SHOWN ON DRAWING TD-RS-100. TRANSPORTATION AND ERECTION OF SIGN FACES SHALL BE CARRIED OUT IN SUCH A WAY THAT DAMAGE TO THE SIGN IS PREVENTED. THE LOWER EDGE OF SIGN FACES SHALL BE HORIZONTAL AFTER COMPLETION OF ERECTION. THE MONTH AND YEAR OF ERECTION OF THE ROAD SIGN SHALL BE INDICATED BY MEANS OF WHITE PAINT ON THE BACK OF THE SIGN IN THE BOTTOM RIGHT HAND CORNER. THE LETTERS AND FIGURES SHALL BE 25mm HIGH.



TYPICAL SECTION

BRACED SUPPORT

SCALE - N.T.S

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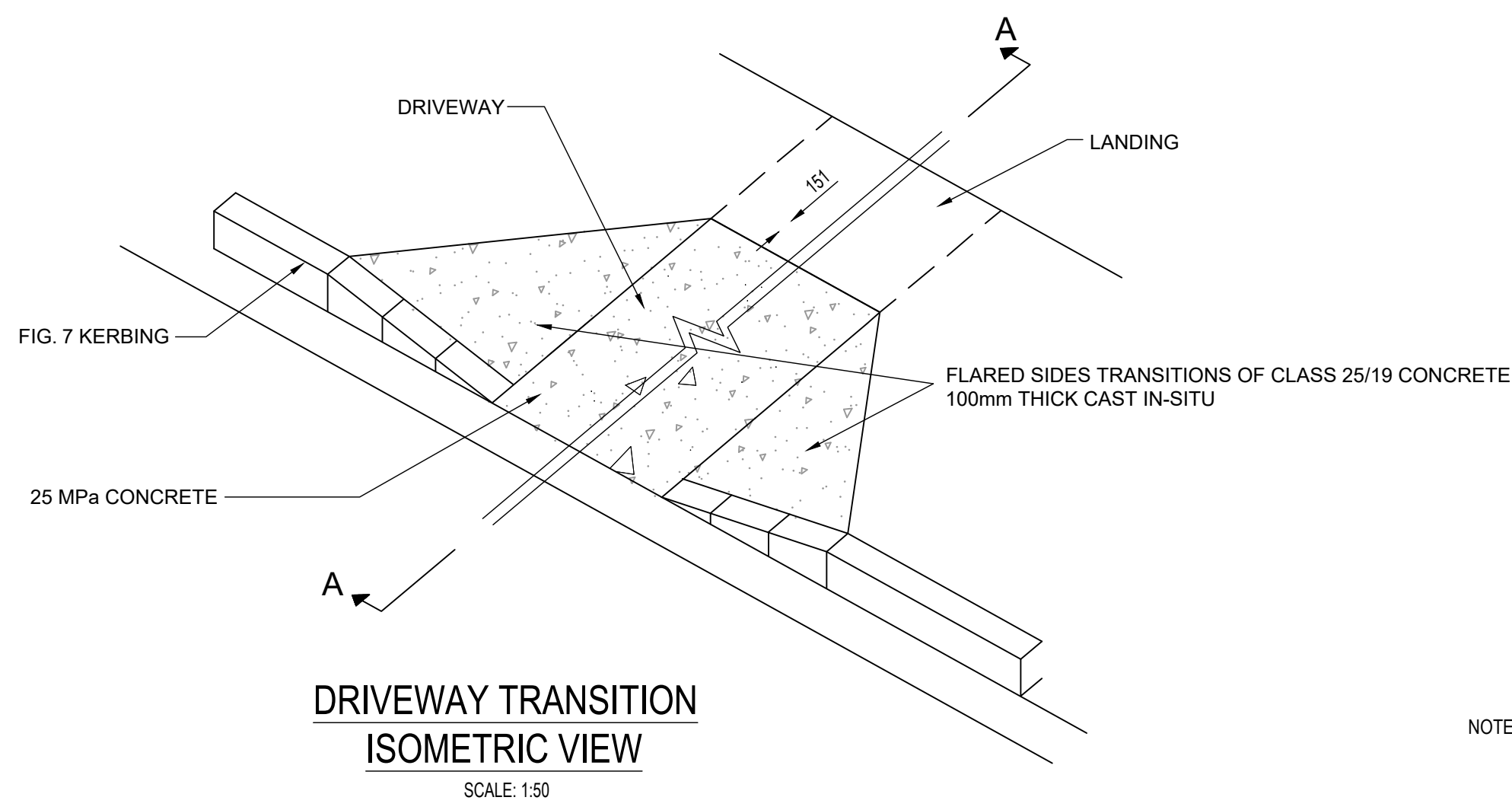
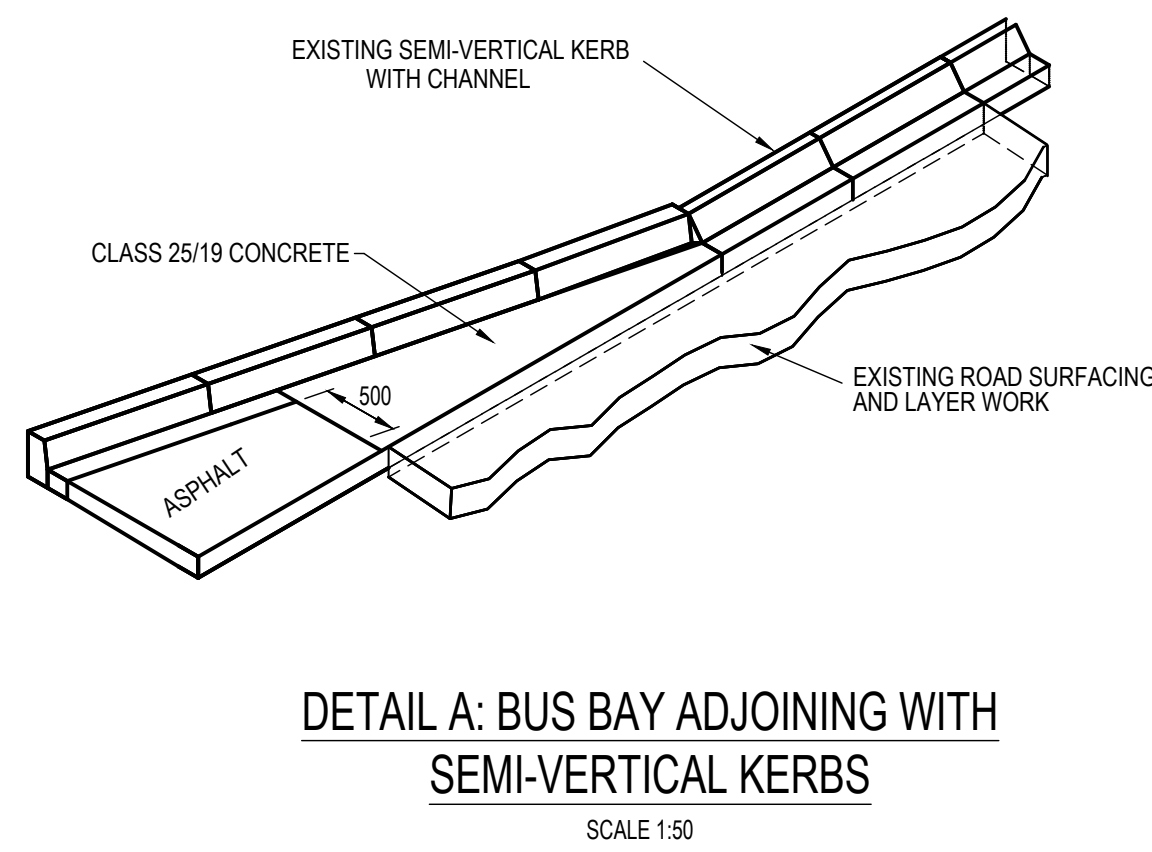
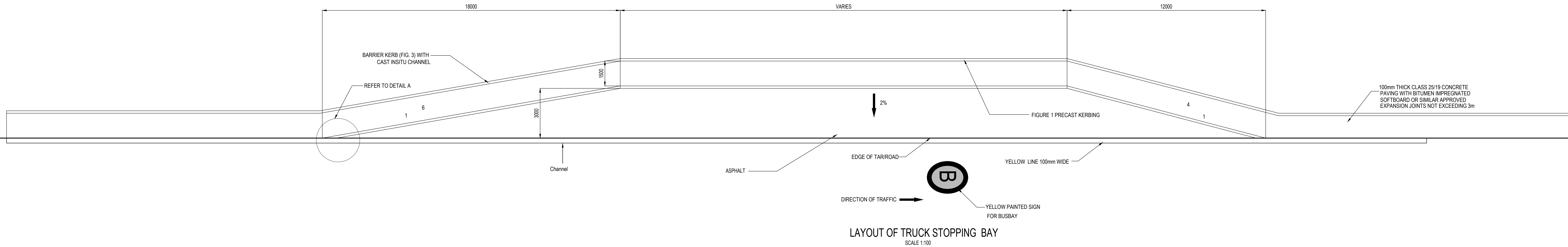
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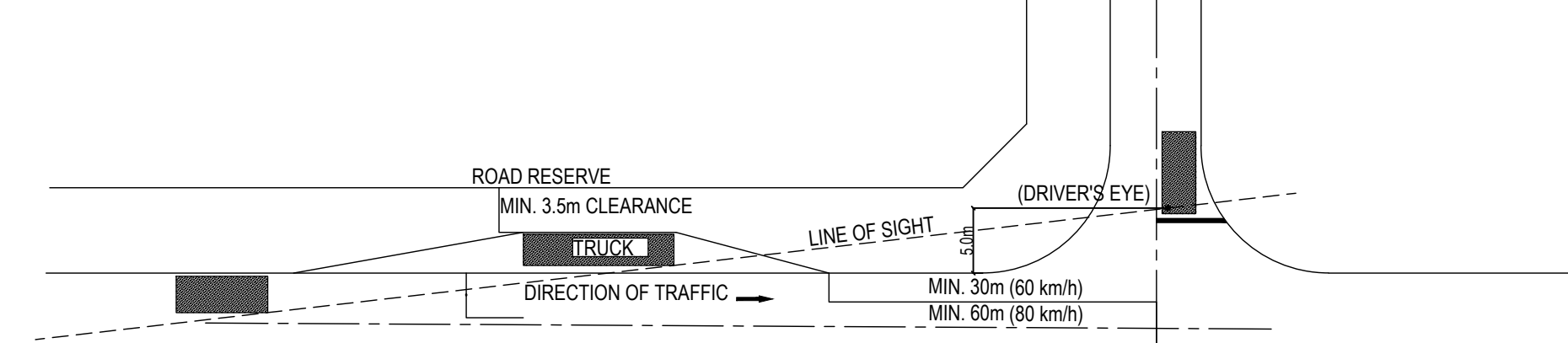
ROAD SIGNS
SUPPORT AND FOUNDATION

SCALE 1:50 DATE 09/07/2024

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STOPPING SIGHT DISTANCE	REQUIREMENT
60 km/h	70m
80 km/h	120m

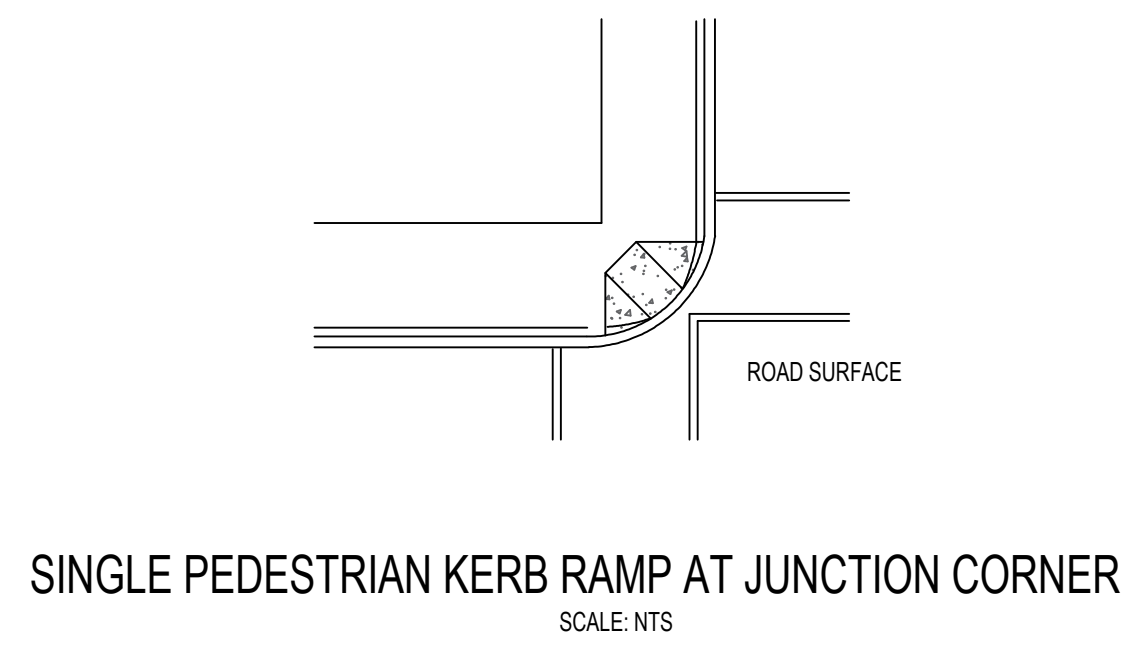
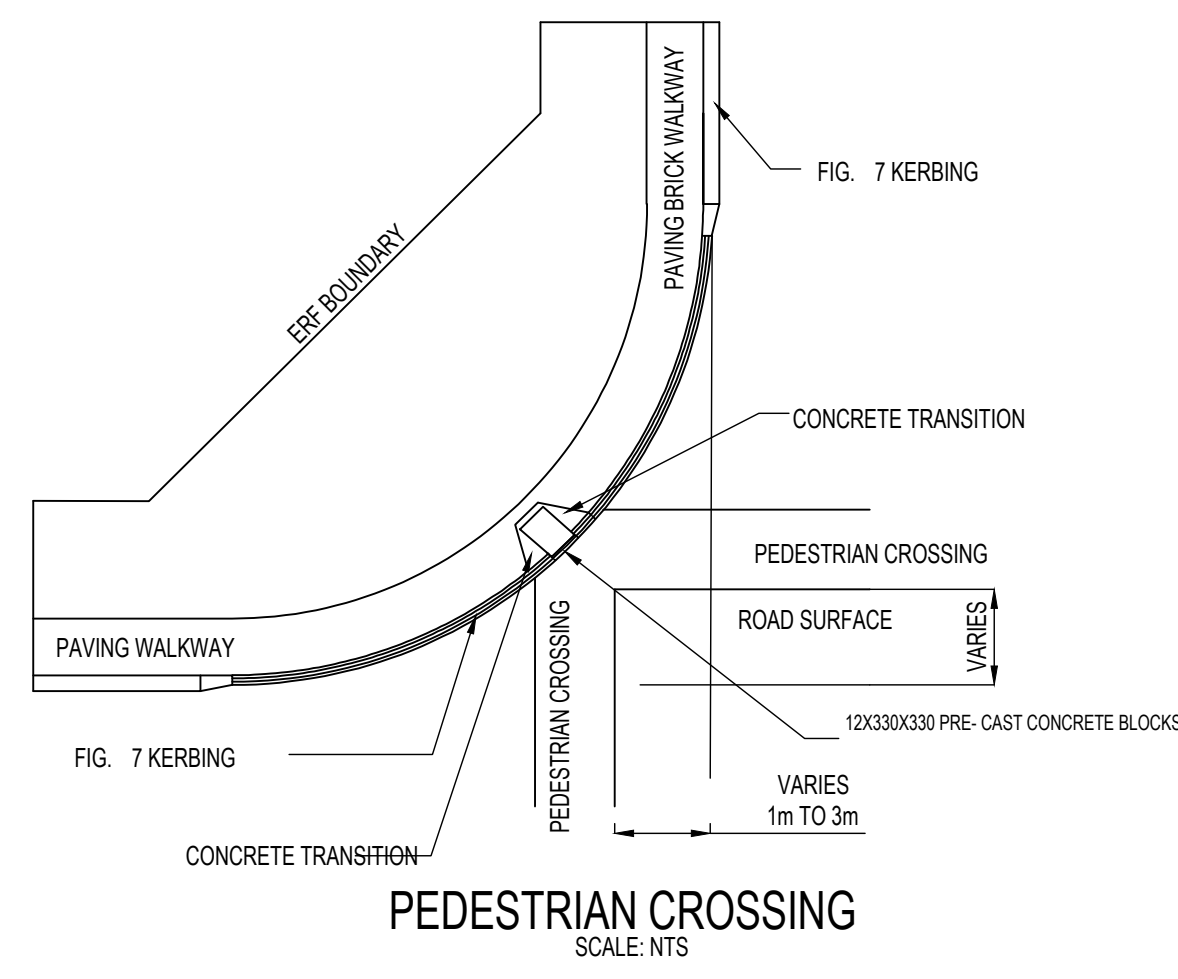
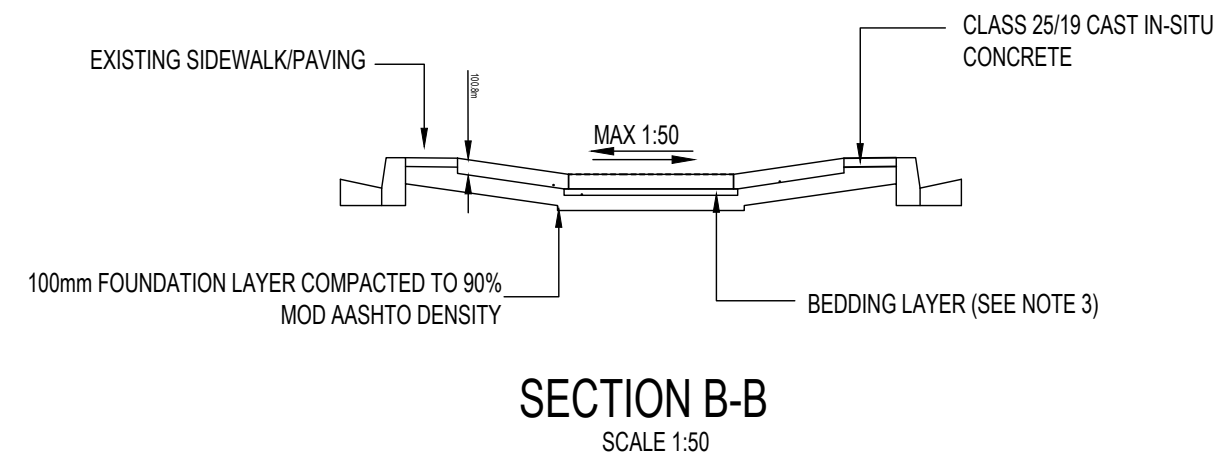
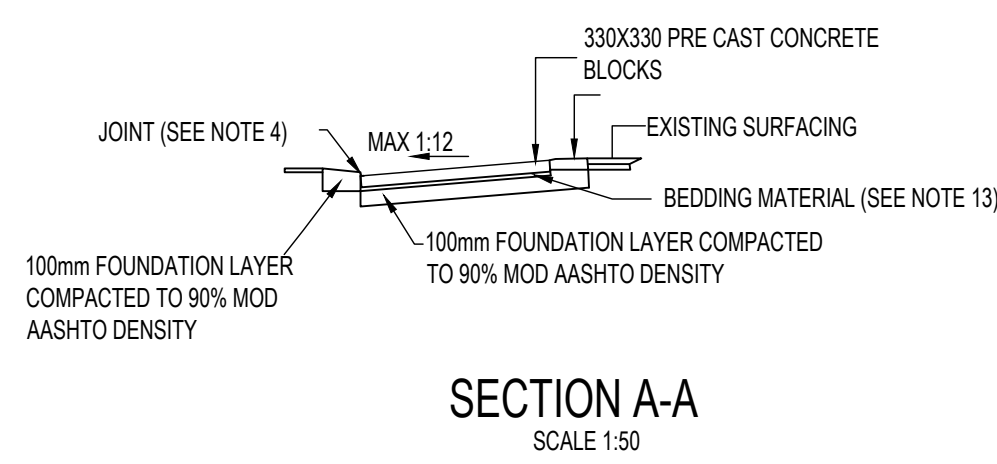


NOTES:

NOTES:

SPECIFICATION OF PEDESTRIAN RAMPS AT STREET CROSSINGS

- RAMPS SHALL BE BUILT AT THE INTERSECTION OF THE EXTENDED KERB LINES. EXCEPTIONS TO ACCOMMODATE ROAD SIDE FURNITURE, SUCH AS TRAFFIC LIGHTS, POWER LINES, ETC. MUST BE APPROVED BY THE ENGINEER.
- THE SLOPE OF THE RAMP SHALL NOT EXCEED 1:12. OTHERWISE, THE RAMP MUST BE EXTENDED.
- THE CROSS FALL OF THE KERBS CAST IN-SITU CHANNEL AT THE RAMP SHALL NOT EXCEED 1:10 OTHERWISE THE CHANNEL AND THE KERB SHALL BE RECONSTRUCTED OVER A MINIMUM LENGTH OF 3 METRES. CARE MUST BE TAKEN TO PREVENT POSSIBLE DRAINAGE PROBLEMS.
- THE CROSS FALL OF THE RAMP SHALL NOT EXCEED 1:50.
- IF NECESSARY, THE PAVING ADJACENT TO THE RAMP AND TRANSITION SECTIONS SHALL BE ADJUSTED TO AVOID SEVERE CHANGES IN GRADE BETWEEN THE PAVING AND THE TRANSITION SECTIONS.
- ALL IN-SITU CONCRETE SHALL BE CURED FOR AT LEAST 12 HOURS.
- THE FOUNDATION LAYER SHALL CONSIST OF 100mm LAYER OF IN-SITU MATERIAL FINISHED TO REQUIRED GRADE AND LEVEL.
- THE FOUNDATION LAYER SHALL BE COMPACTED TO AT LEAST 90% MOD AASHTO DENSITY.
- THE BEDDING MATERIAL UNDER THE CONCRETE BLOCKS, SHALL CONSIST OF A 6:1 RIVER SAND/CEMENT MIXTURE.
- EXISTING PAVING MUST BE CUT IN STRAIGHT LINES, FOLLOWING AN APPROVED METHOD.
- KERBS AT OPENINGS SHALL BE FIG 8. MOUNTABLE KERBS



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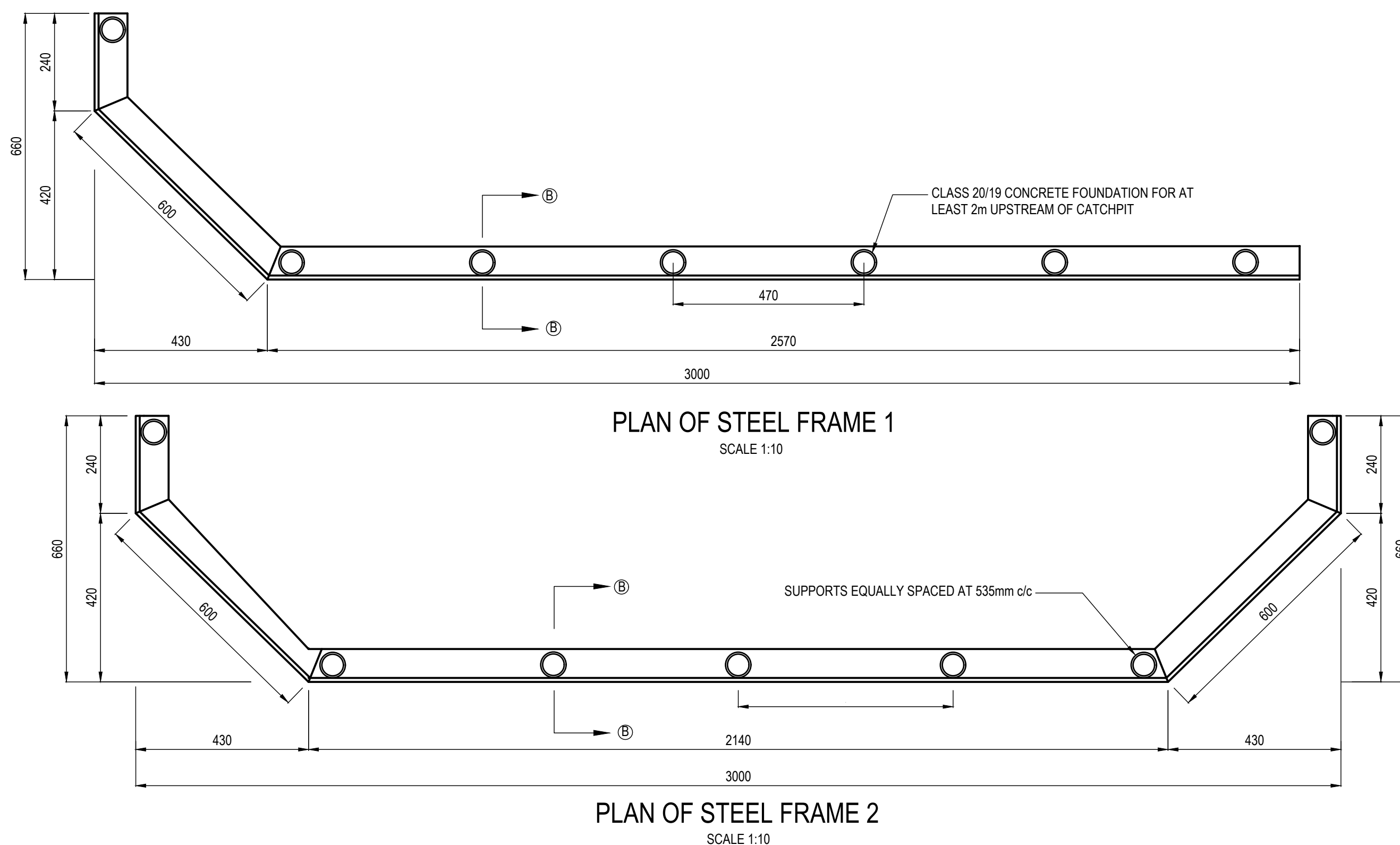
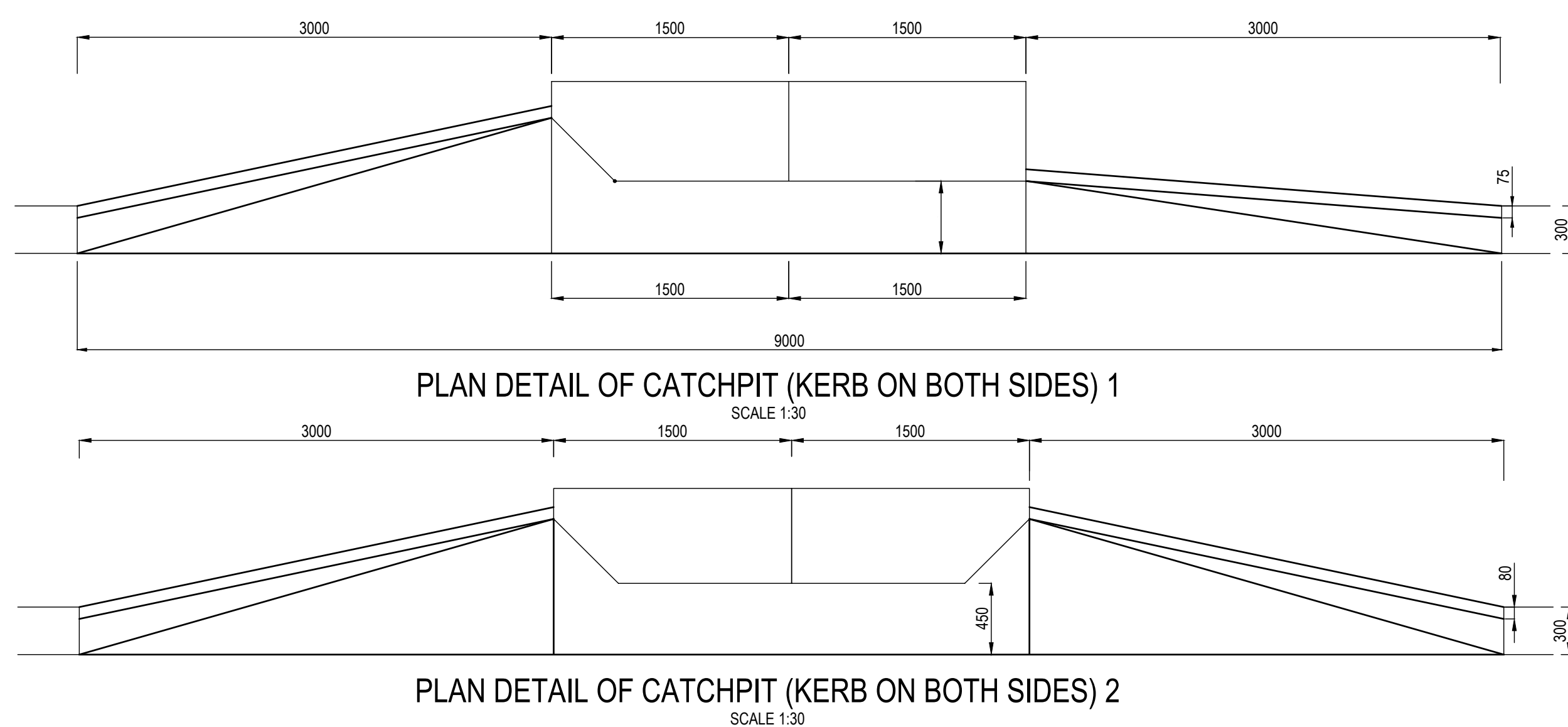
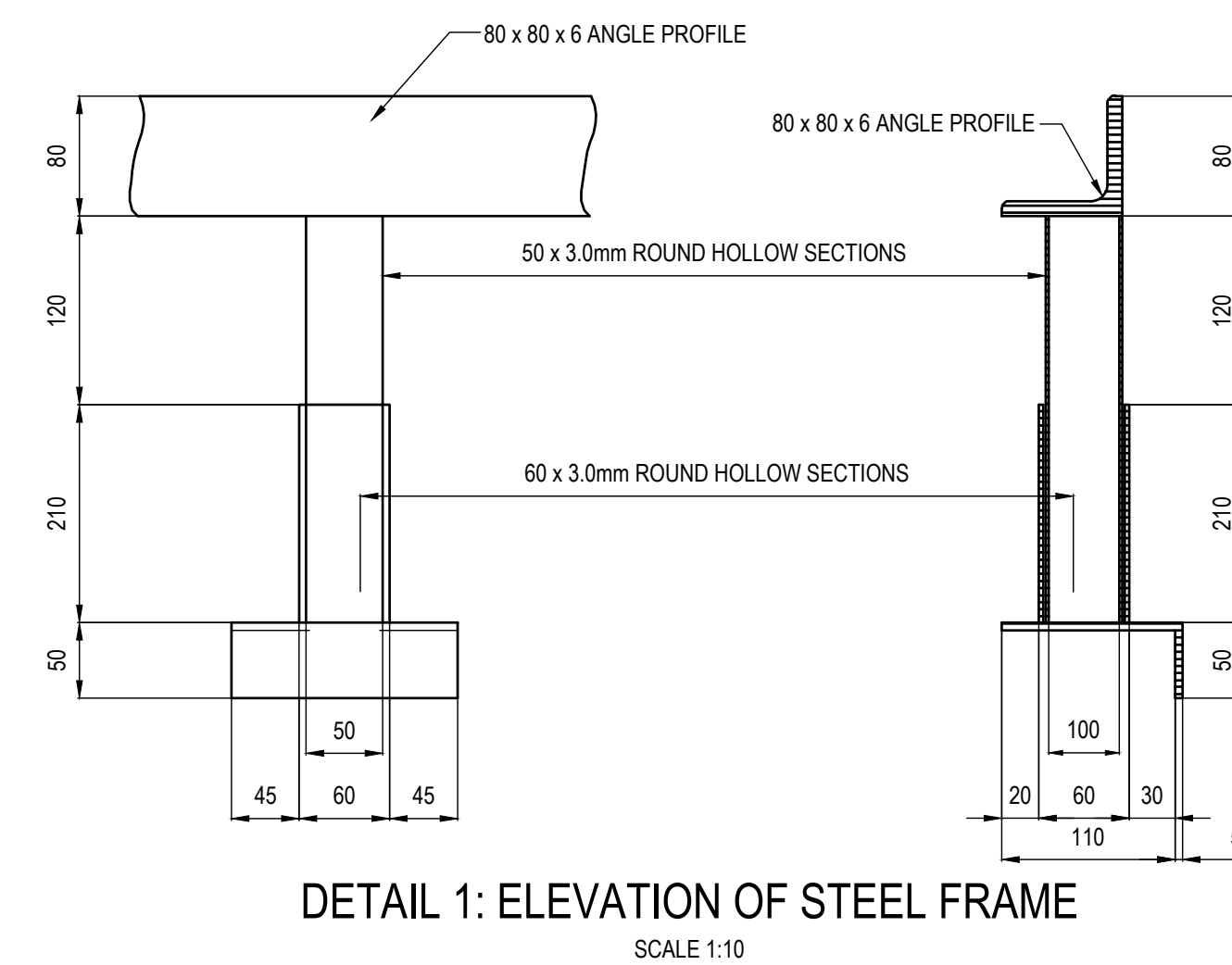
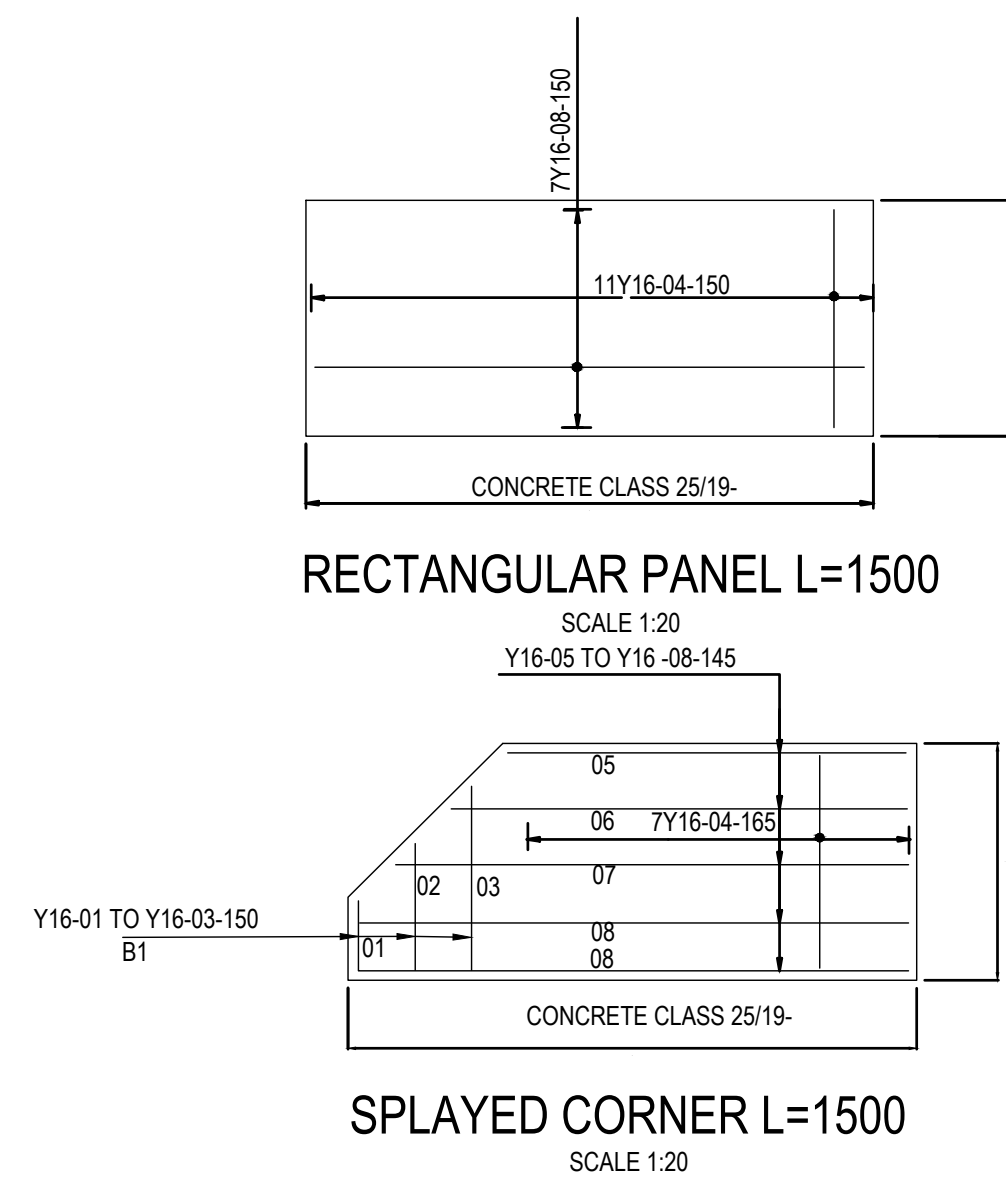
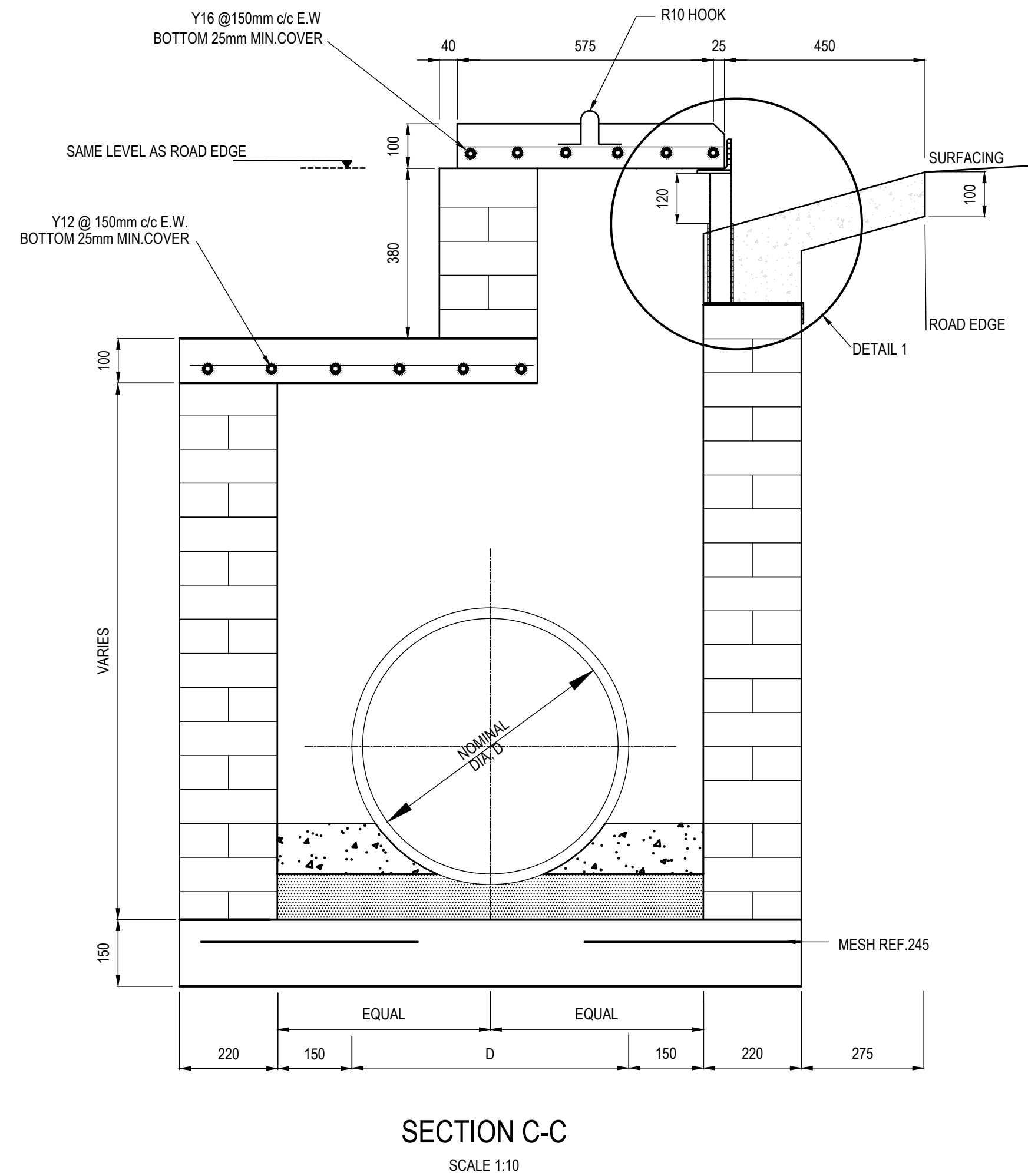
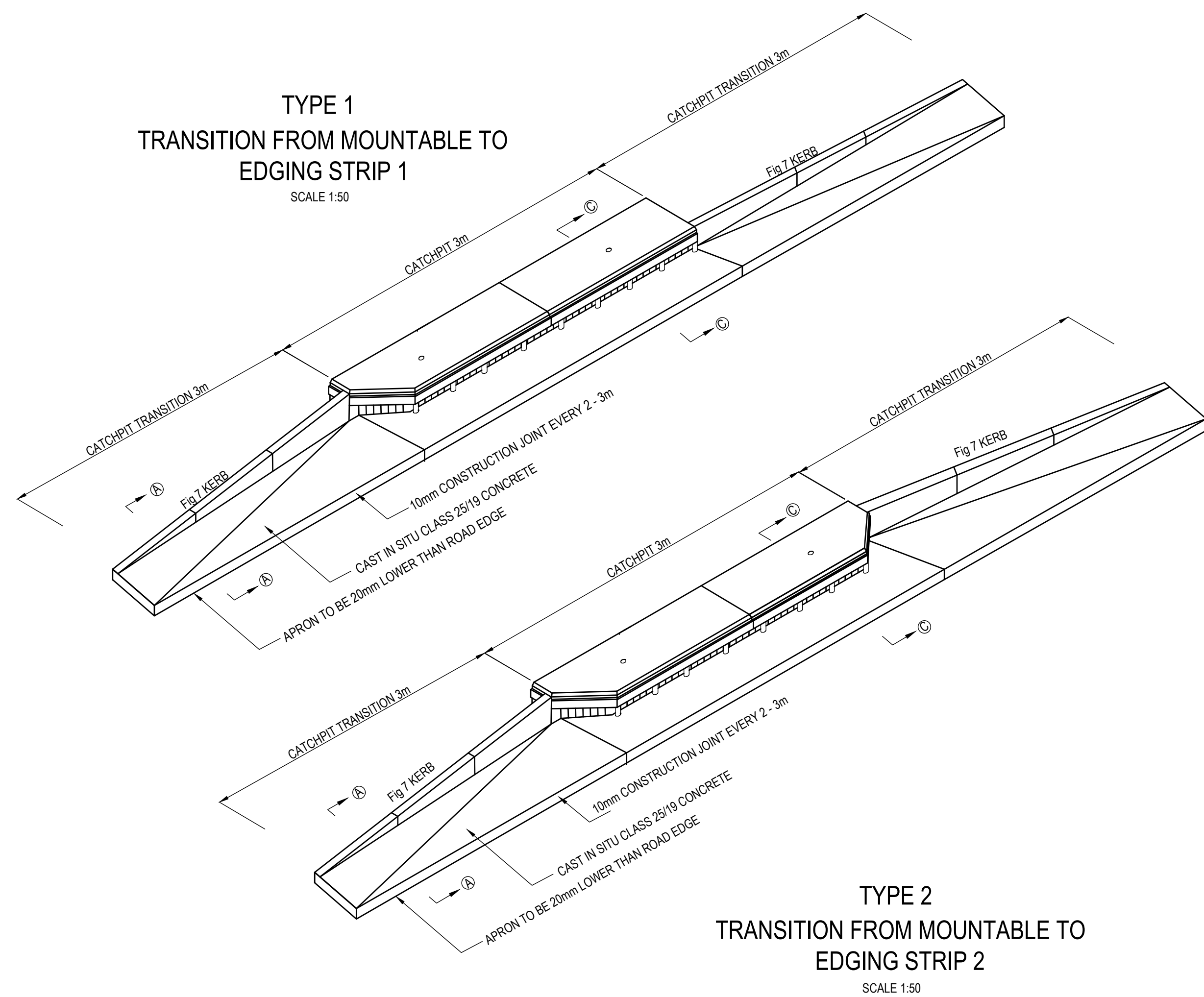


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REGISTRATION NUMBER			

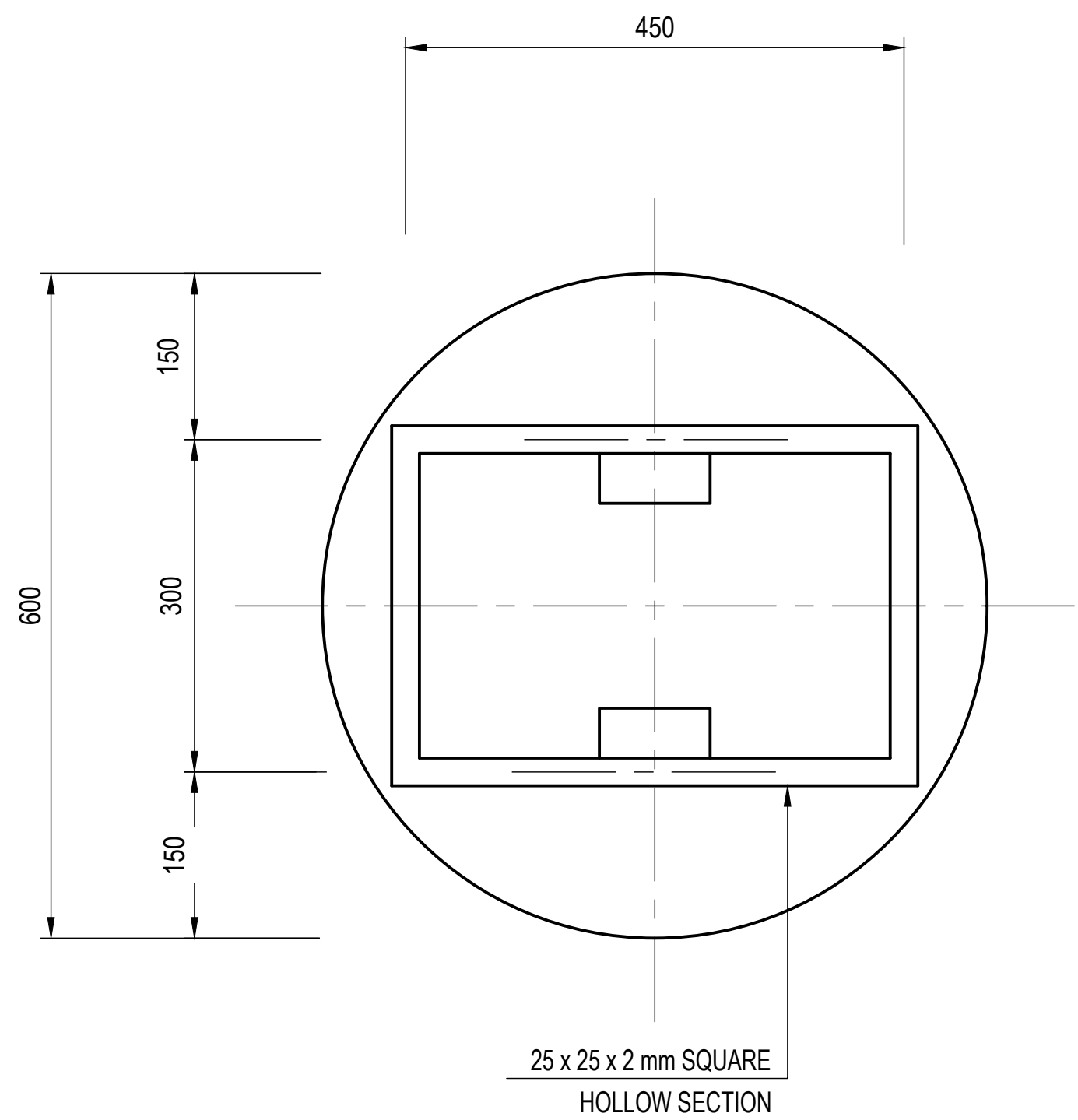
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PEDESTRIAN CROSSING AND BUS BAY

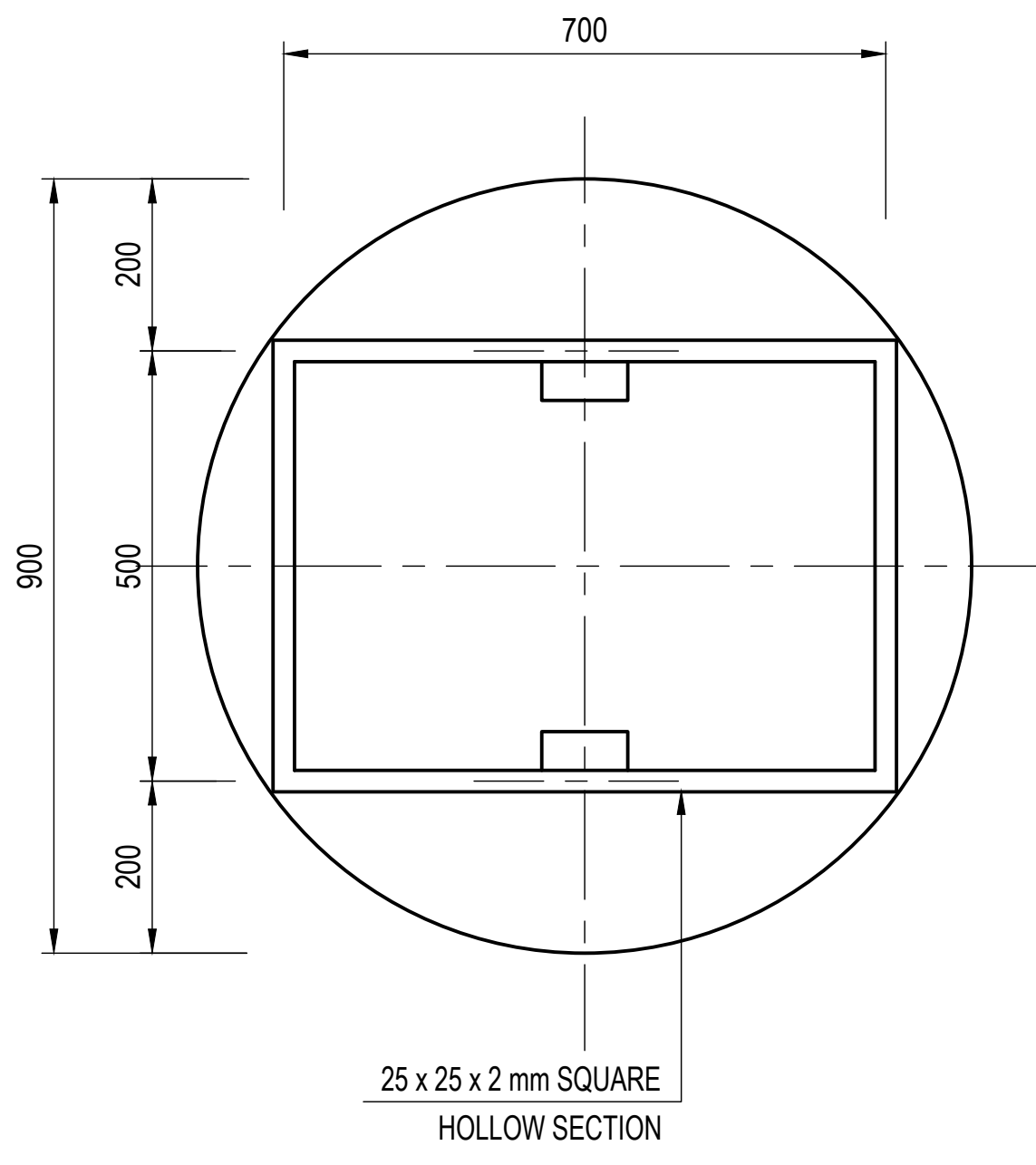
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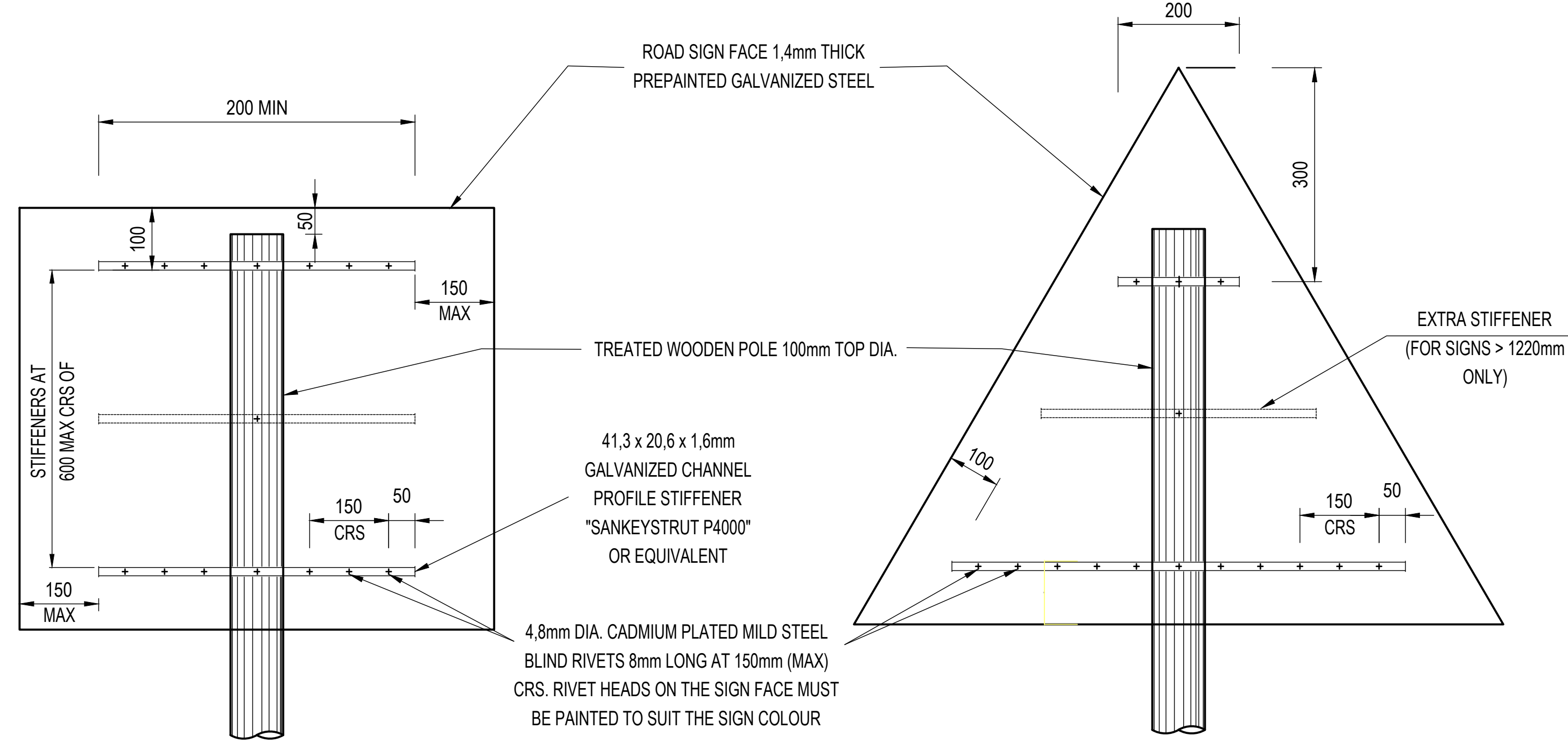
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KERB INLET AND CATCHPIT DETAILS				
SCALE 1:50		DATE 09/07/2024		
DRAWING NUMBER 43034/07/STD/06		REVISION A1 		



SINGLE SUPPORT

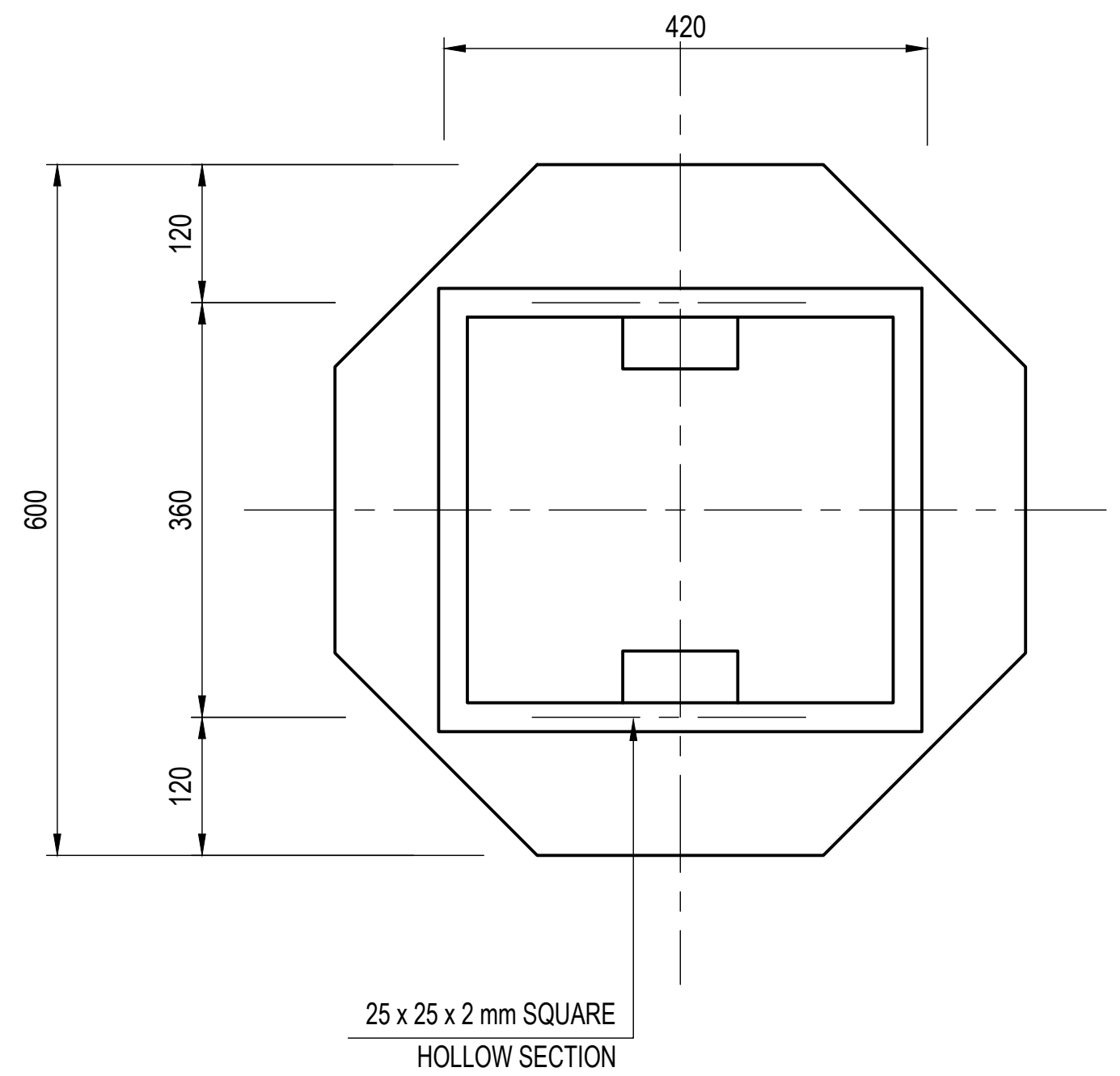


SINGLE SUPPORT
REINFORCEMENT FOR CIRCULAR ROAD SIGNS
SCALE 1 : 20

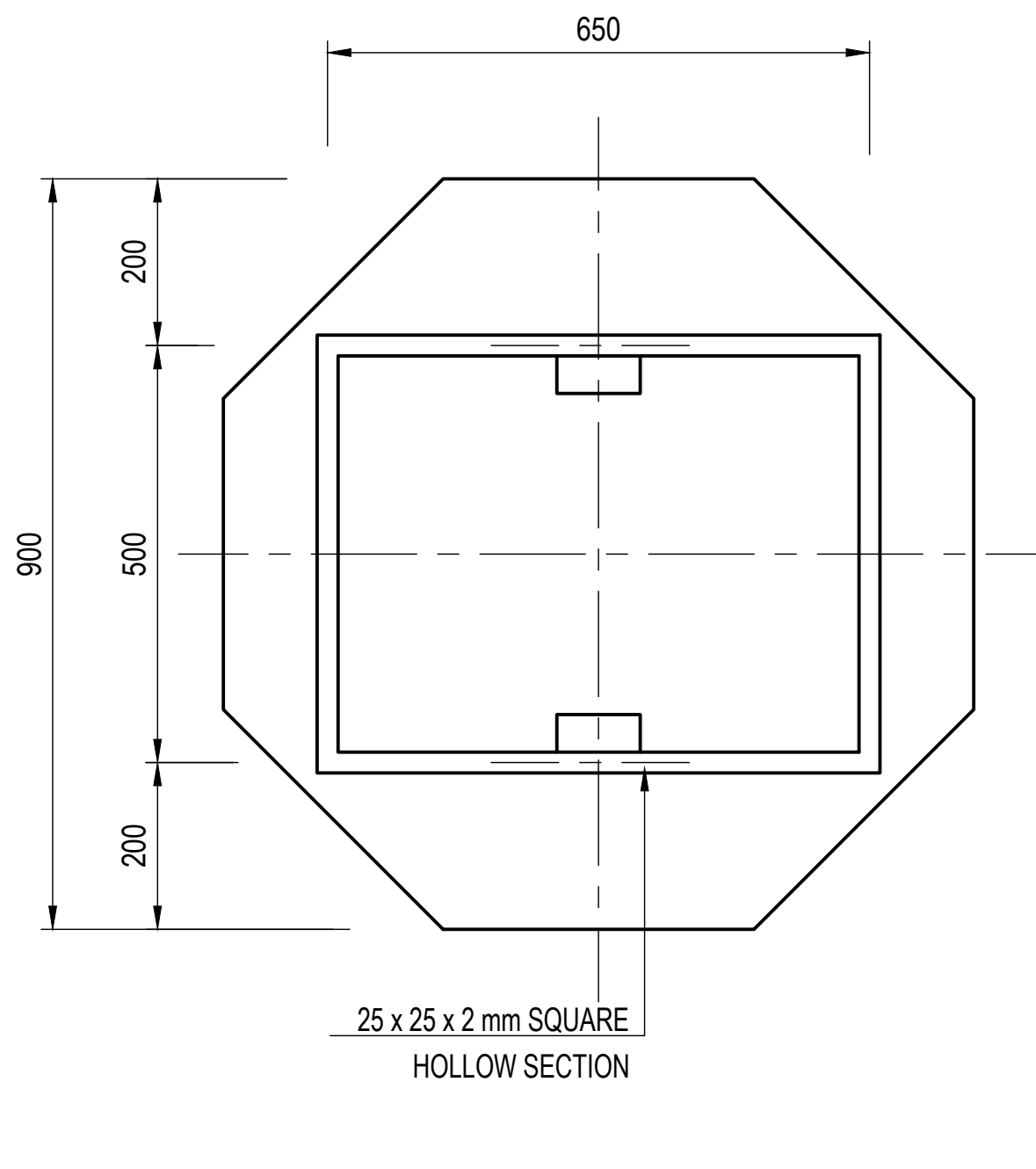


REAR ELEVATION

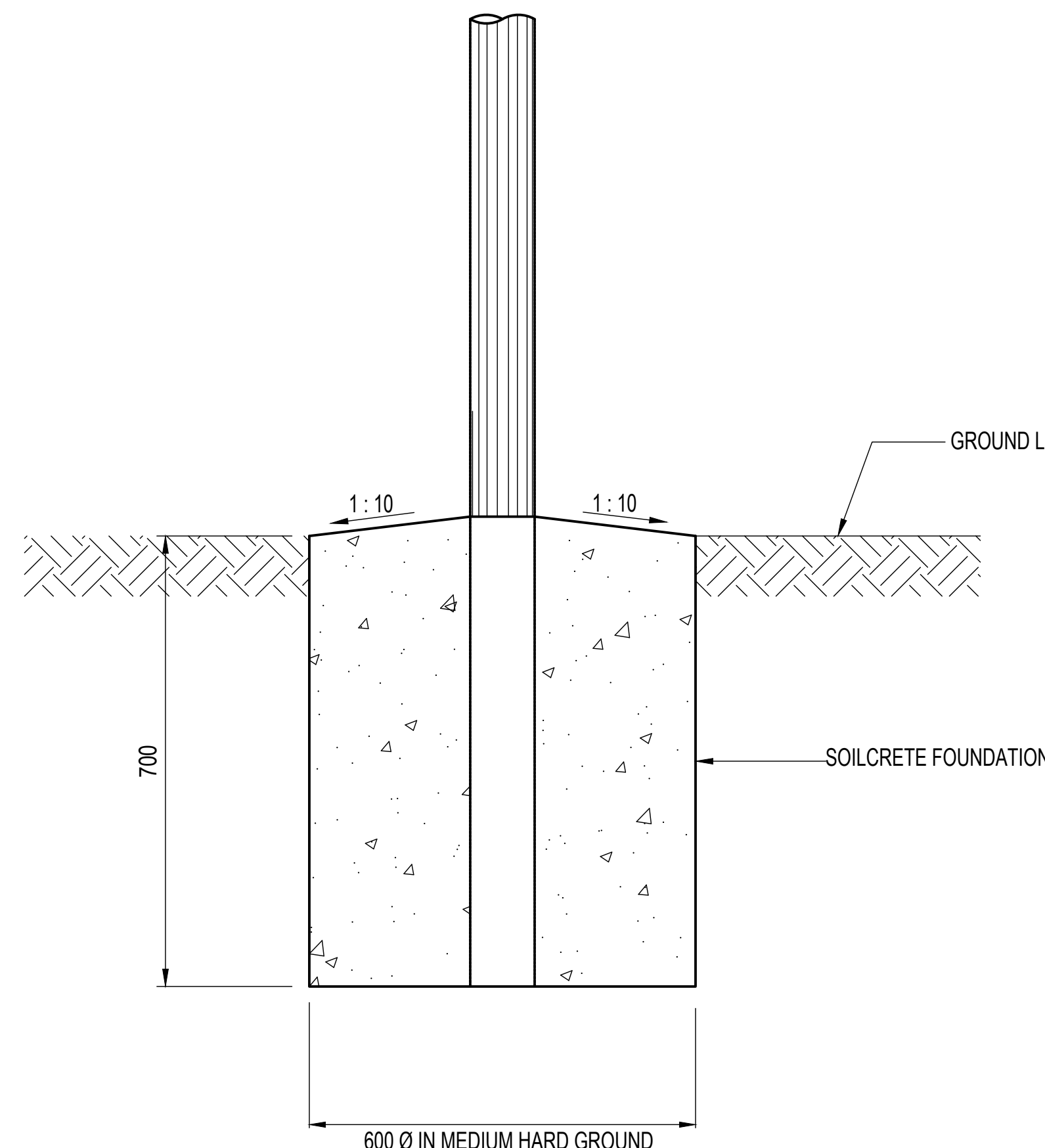
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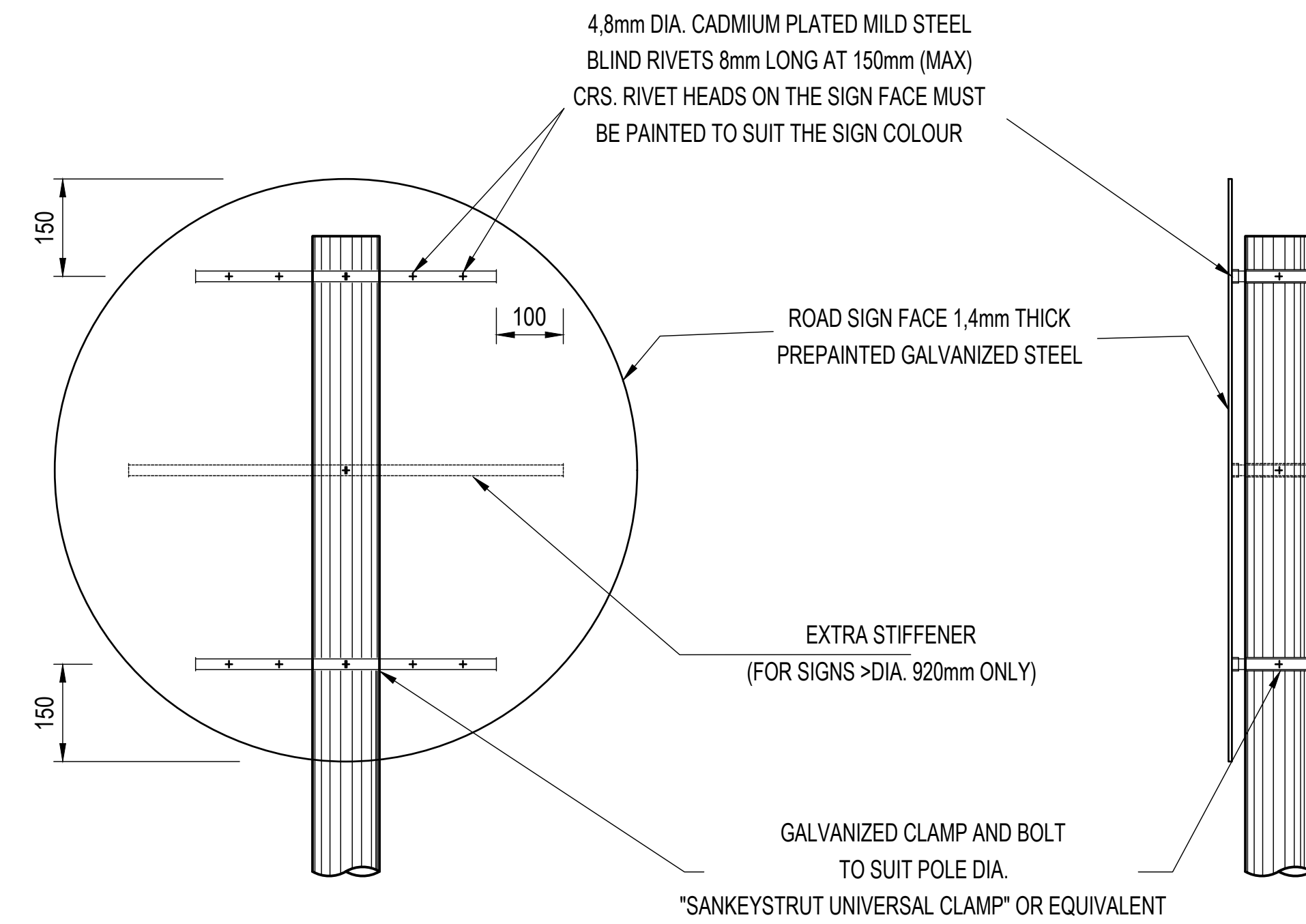
SINGLE SUPPORT



SINGLE SUPPORT
REINFORCEMENT FOR STOP SIGNS
SCALE 1 : 20

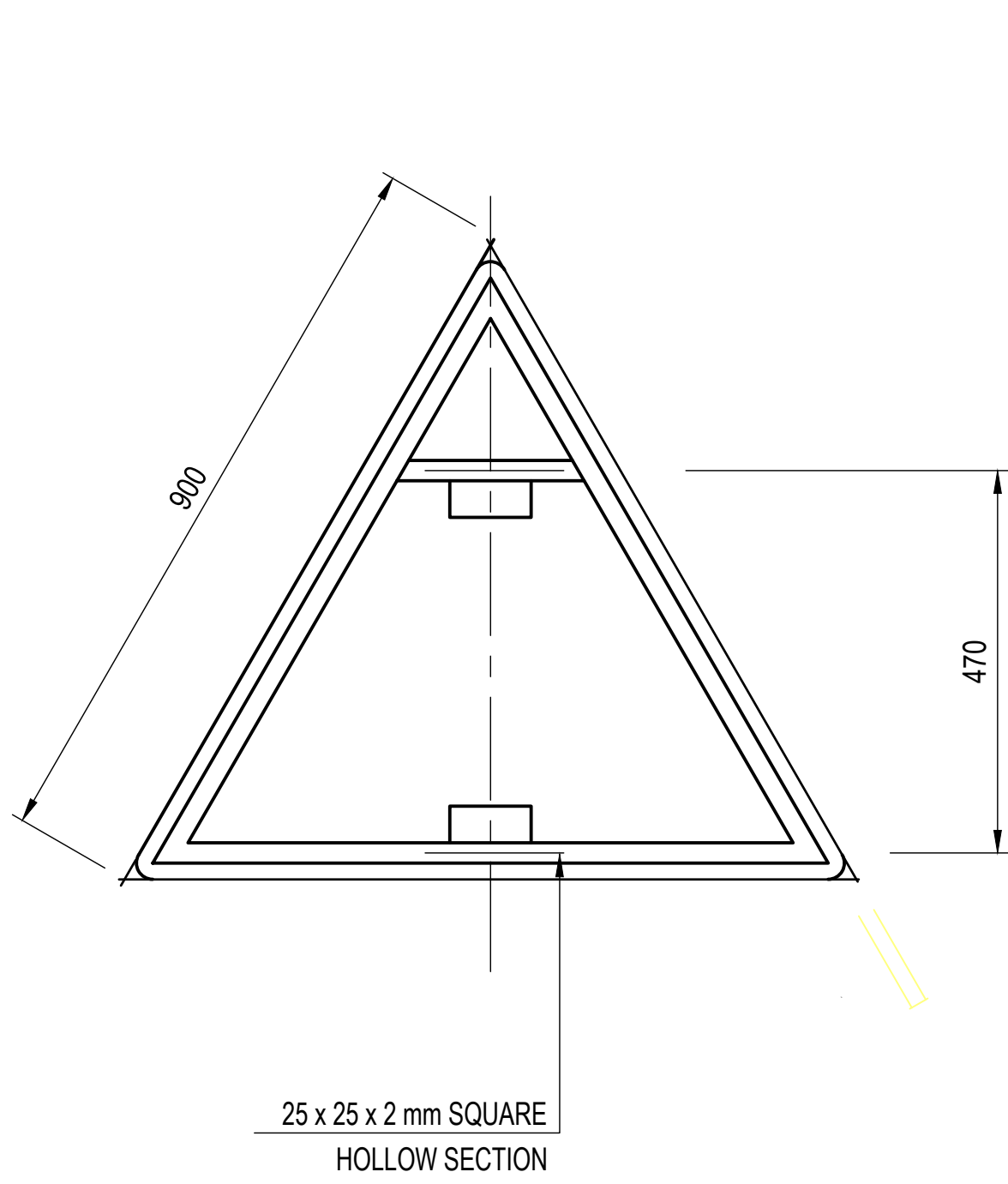


TYPICAL FOUNDATION

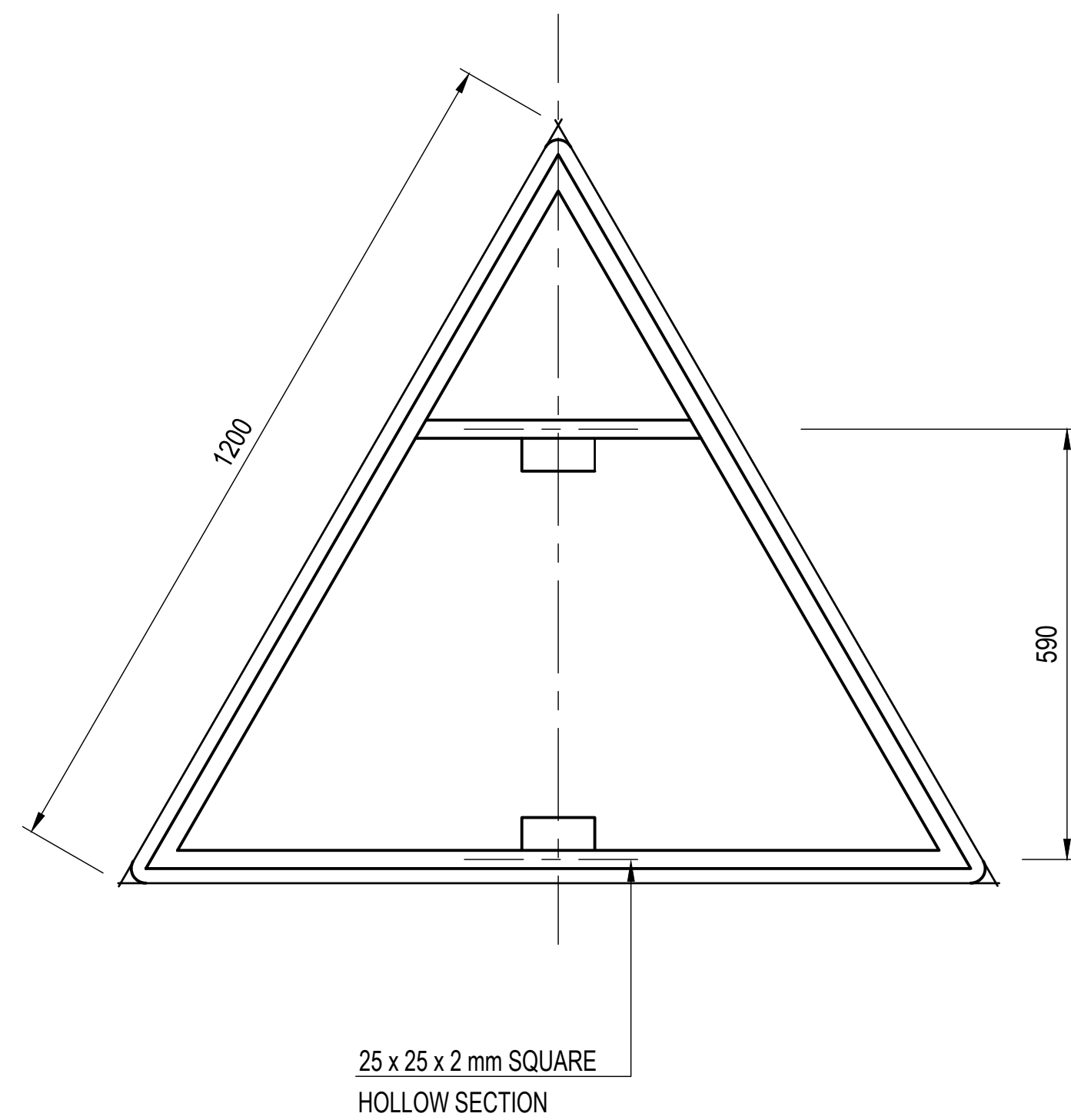


REAR ELEVATION

TYPICAL SIDE ELEVATION



SINGLE SUPPORT



SINGLE SUPPORT
REINFORCEMENT FOR TRIANGULAR ROAD SIGNS
SCALE 1 : 20

MINIMUM REGULATORY SIGN SIZES		
	OPERATING SPEED (km/h)	
	70 - 90	60
CIRCULAR SIGN DIAMETER (mm)	900	600
RECTANGULAR SIGN WxH (mm)	900 x 675	600 x 450
TRIANGULAR SIGN SIDE LENGTH (mm)	1200	900

ADVANCE WARNING SIGN LOCATION AND SIZE		
OPERATING SPEED (km/h)	LOCATION (DISTANCE FROM HAZARD) (m)	SIZE (mm)
80	160	1200
60	120	900

NOTES:

THE ROAD SIGN FACES SHALL BE MANUFACTURED AND ERECTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS :

- DETAILS ON THIS DRAWING ARE APPLICABLE TO ROAD SIGNS SMALLER THAN 1.5m² REQUIRING DOUBLE / SINGLE SUPPORTS.
- BOLTS, WASHERS AND NUTS SHALL COMPLY WITH THE REQUIREMENTS OF SANS 1700-5-1 AND SHALL BE GALVANISED IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999).
- BLIND RIVETS SHALL BE 4.8mm DIA CADMIUM PLATED MILD STEEL.
- REFERENCE MUST BE MADE TO THE RELEVANT ROAD SIGNS DETAIL DRAWING FOR DETAILS OF THE ROAD SIGN SYMBOLS AND LEGEND FOR EACH INDIVIDUAL SIGN.
- STRUCTURAL STEEL SECTION SHALL BE MILD STEEL CONFORMING TO THE REQUIREMENTS OF SANS 1431, GRADE 300W. RECTANGULAR HOLLOW SECTION AND SPECIAL CHANNEL PROFILE MAY BE COLD FORMED OF COMMERCIAL QUALITY MILD STEEL. ALL SECTION SHALL BE HOT-DIP GALVANISED IN ACCORDANCE WITH THE REQUIREMENTS OF SANS 121 : 2000 (ISO 1461 : 1999).

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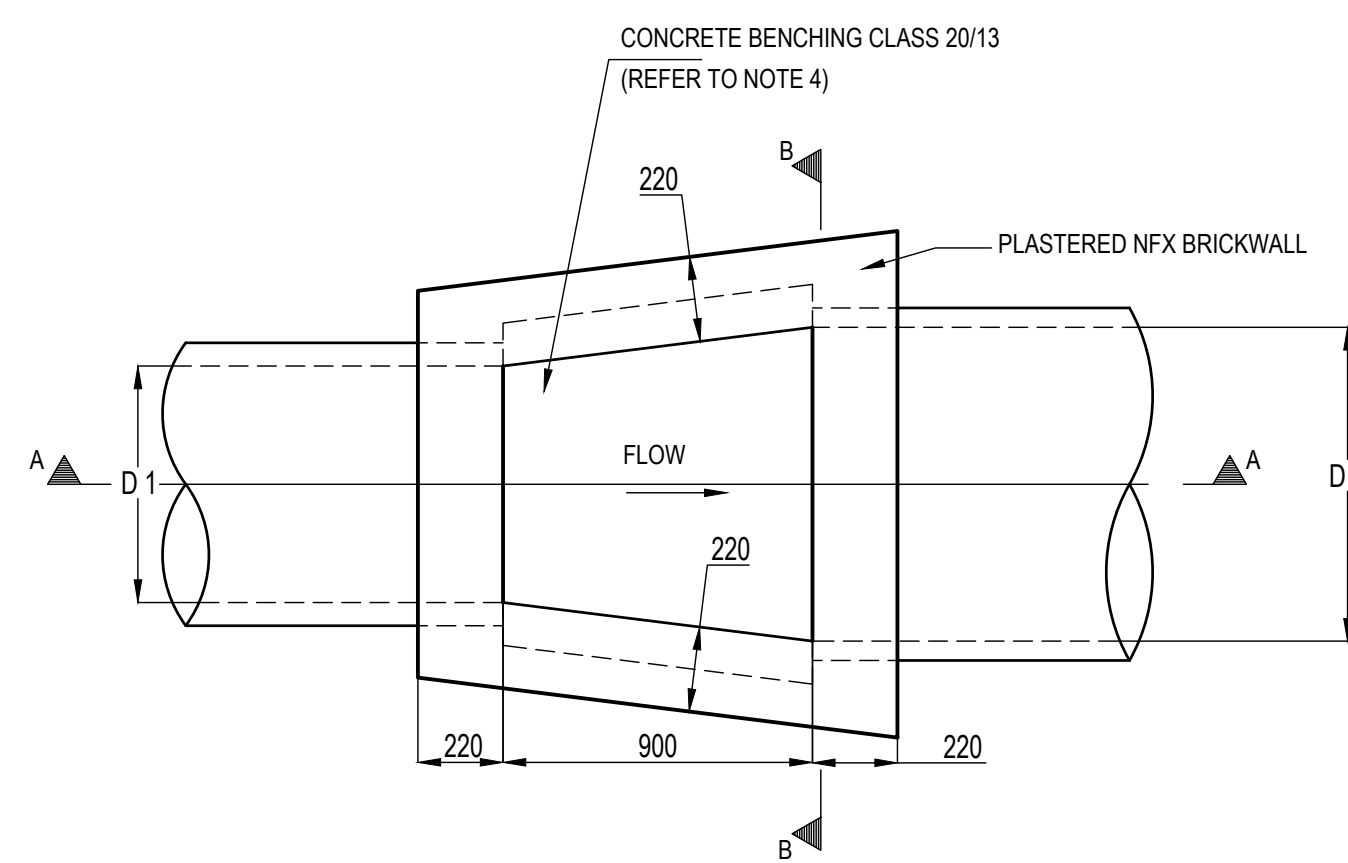
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CHECKED		CIVIL ENGINEER	
CLIENT	SIGNATURE		SIGNATURE
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CONDITION ASSESSMENT

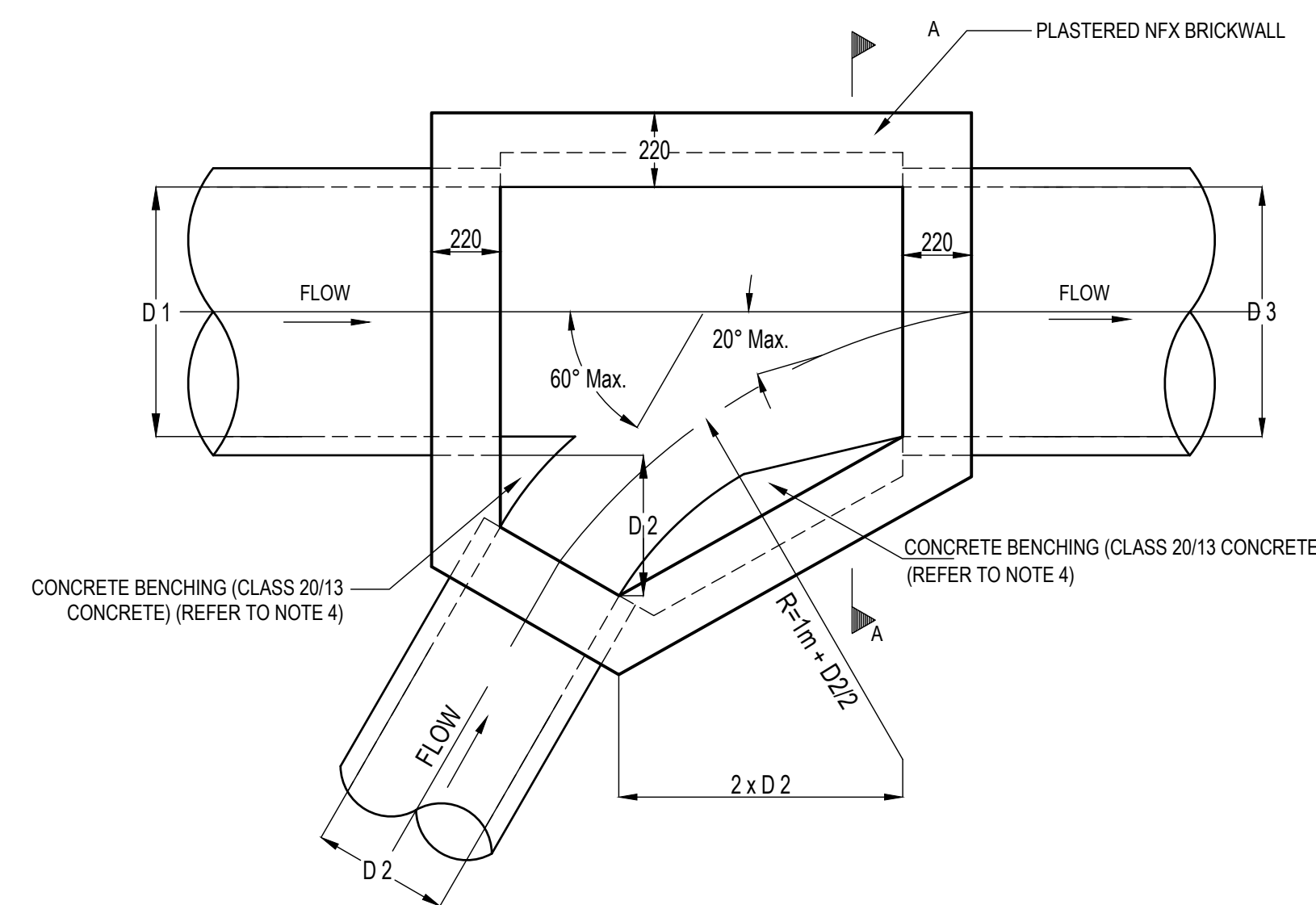
ROAD FURNOITURE DETAILS

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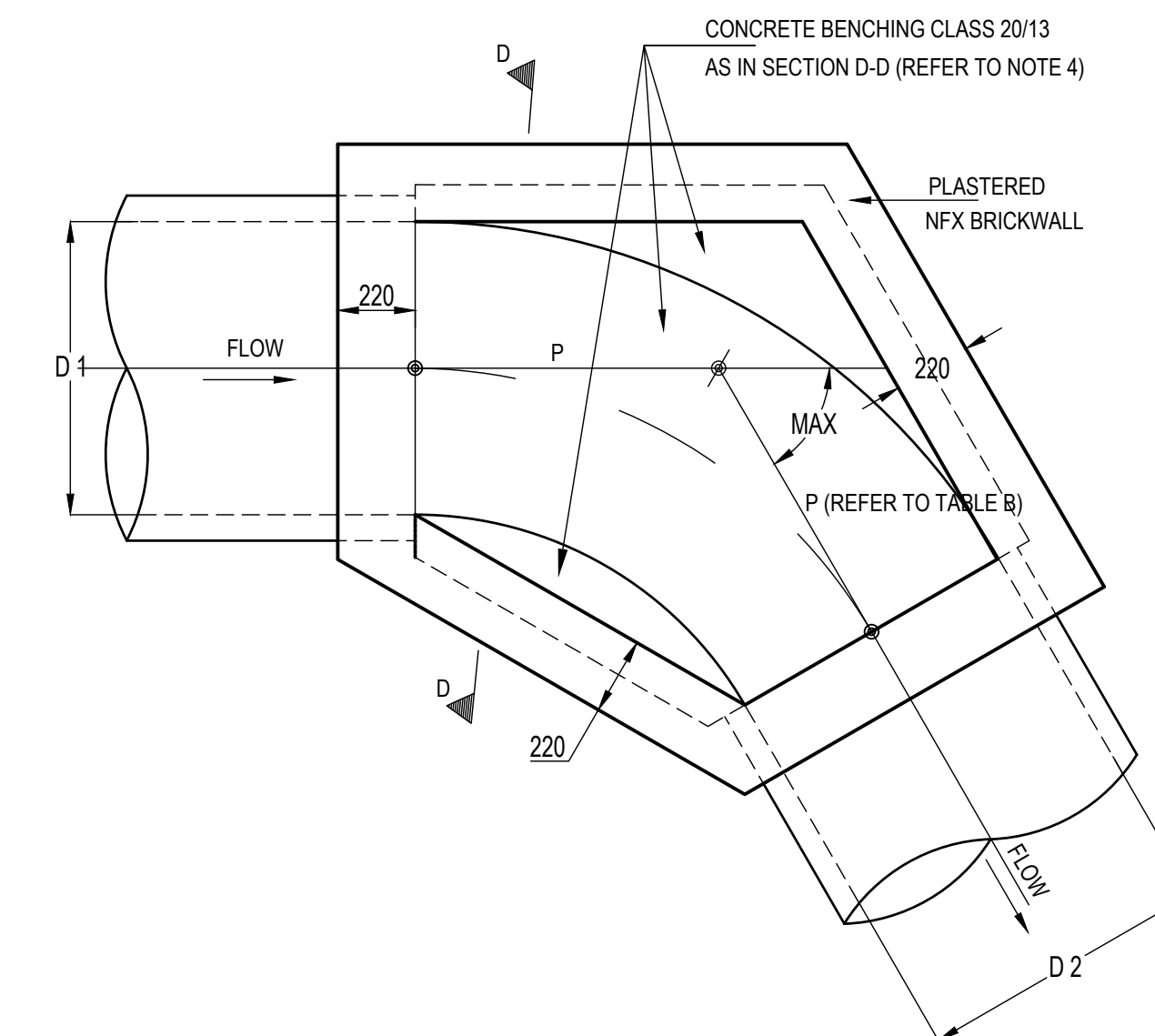




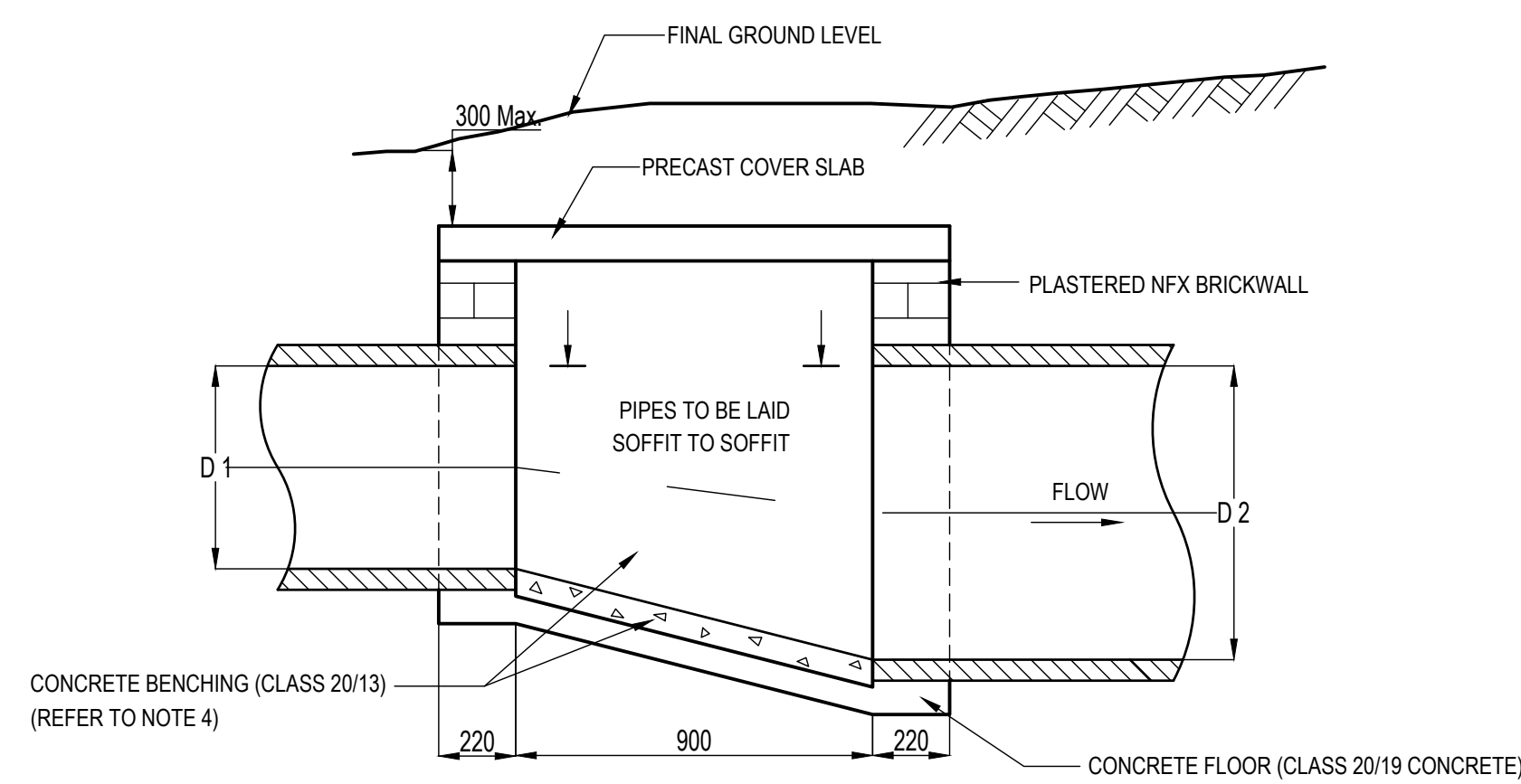
PLAN OF TYPE A JUNCTION BOX (WITHOUT COVER SLAB)
D 1 < D 2



PLAN OF TYPE B JUNCTION BOX (WITHOUT COVER SLAB)
D 1 = D 3 AND D 2 VARIES



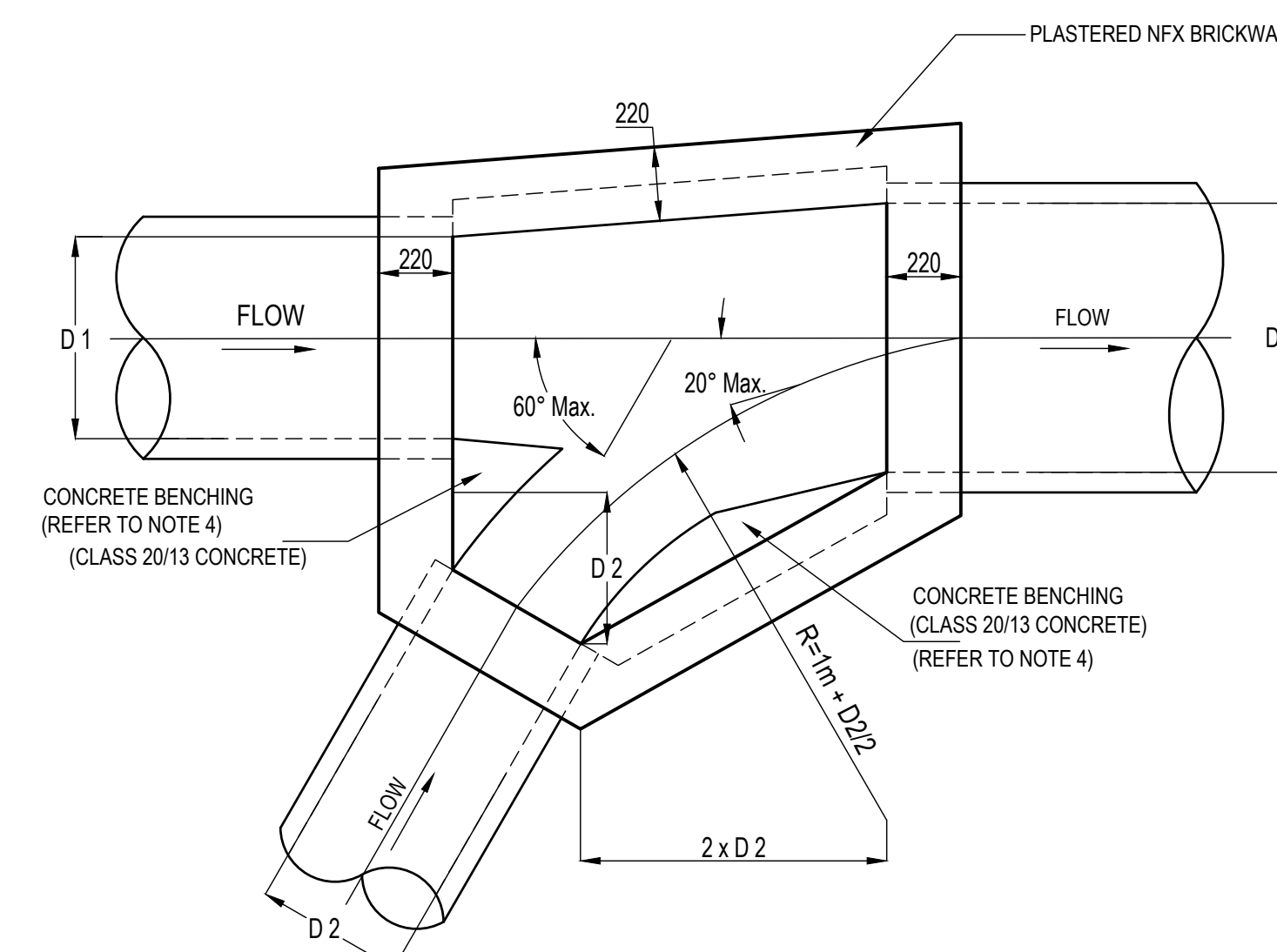
PLAN OF TYPE C JUNCTION BOX (WITHOUT COVER SLAB)
D 1 = D 2 OR D 1 < D 2



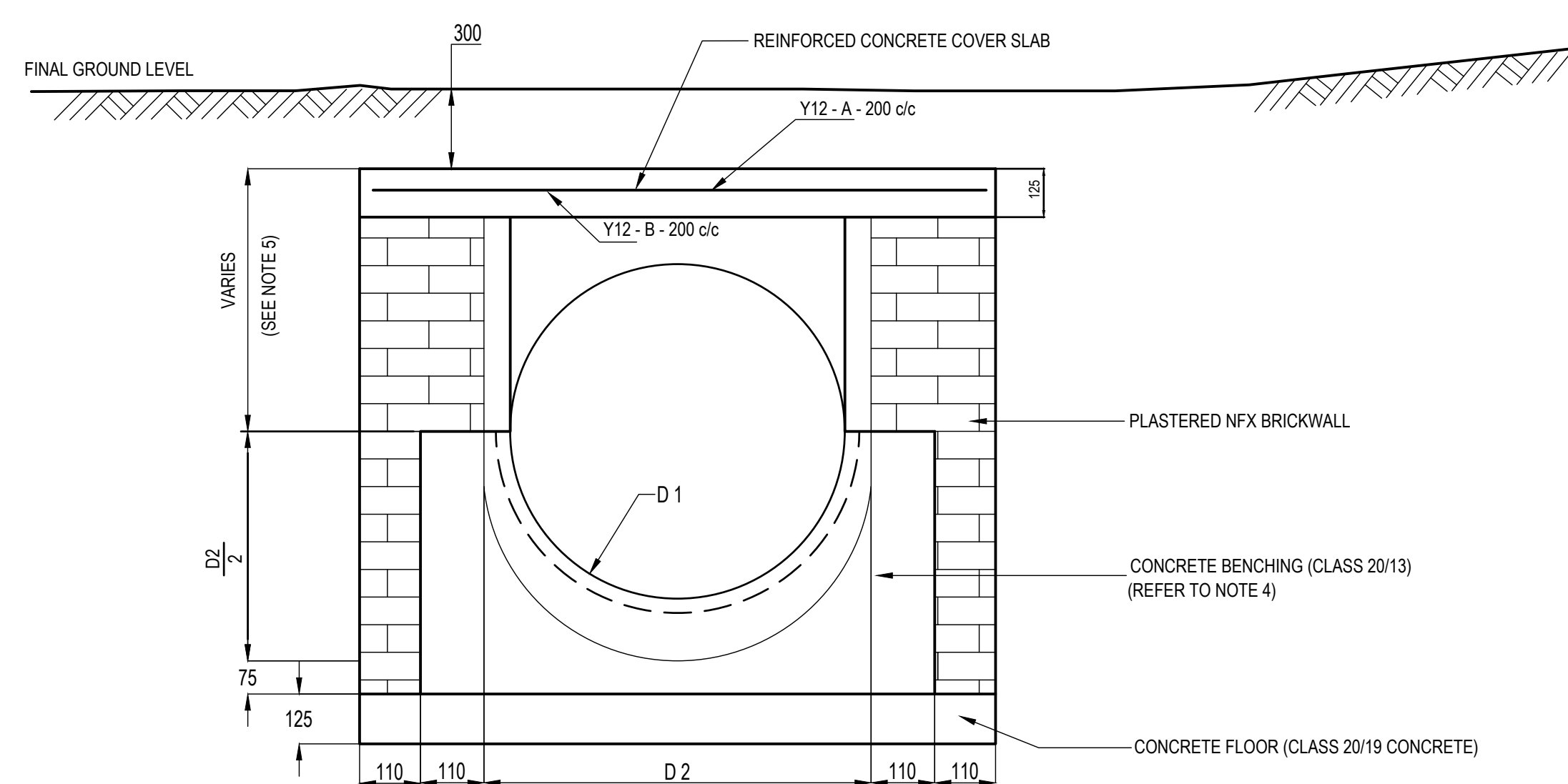
SECTION A-A

TABEL B

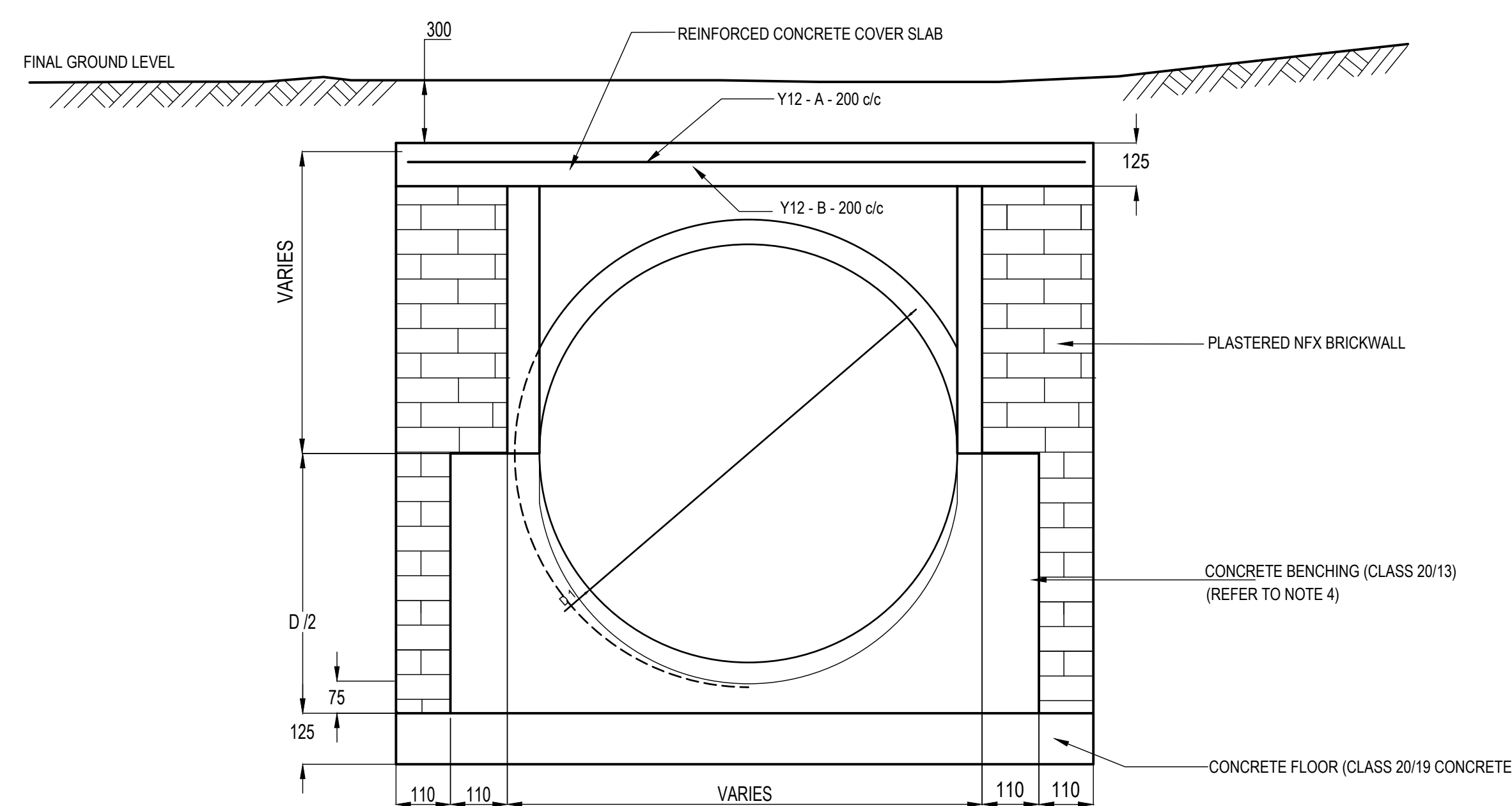
D2 DIAMETER OF PIPE DOWN STREAM	DISTANCE P
450	700
525	700
600	750
675	780
750	800
825	825
900	850
1050	870
1200	925
1350	1000
1500	1100



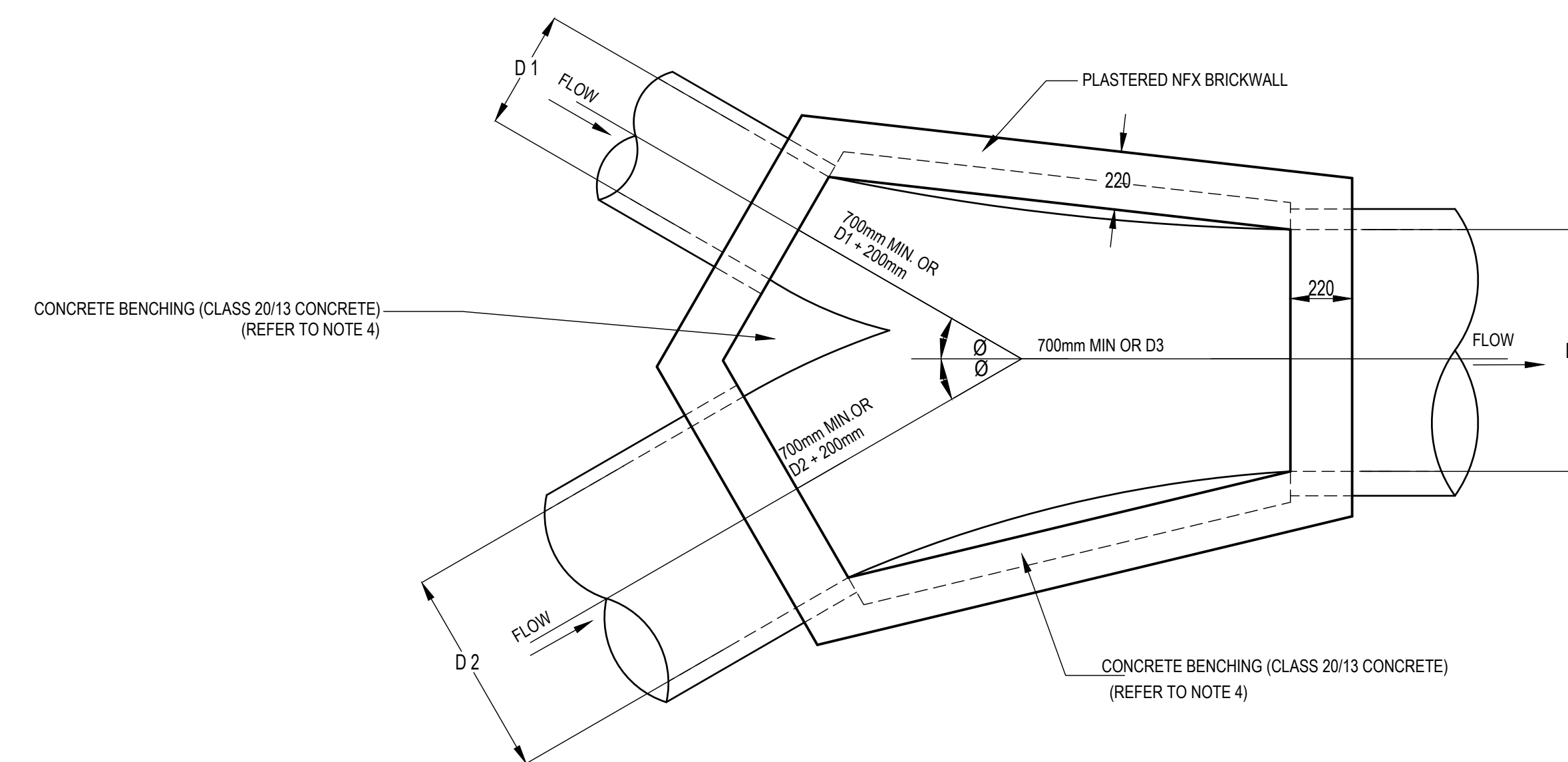
PLAN OF TYPE D JUNCTION BOX (WITHOUT COVER SLAB)
D 1 = D 3 AND D 2 VARIES



SECTION B-B



SECTION D-D



PLAN OF TYPE E JUNCTION BOX (WITHOUT COVER SLAB)
D 1 = D 2 = D 3 AND $\theta < 30^\circ$

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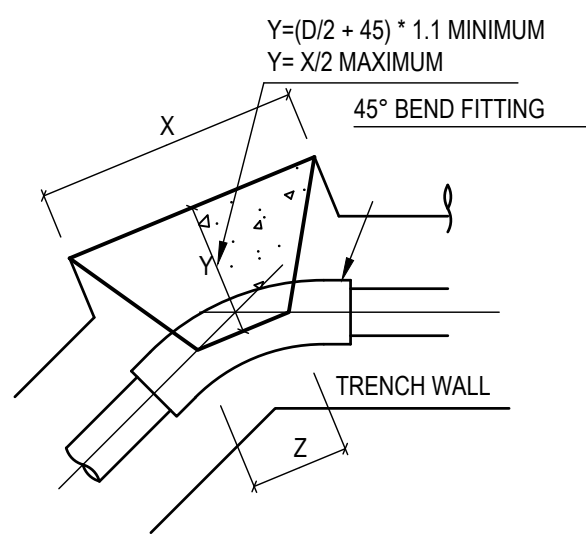
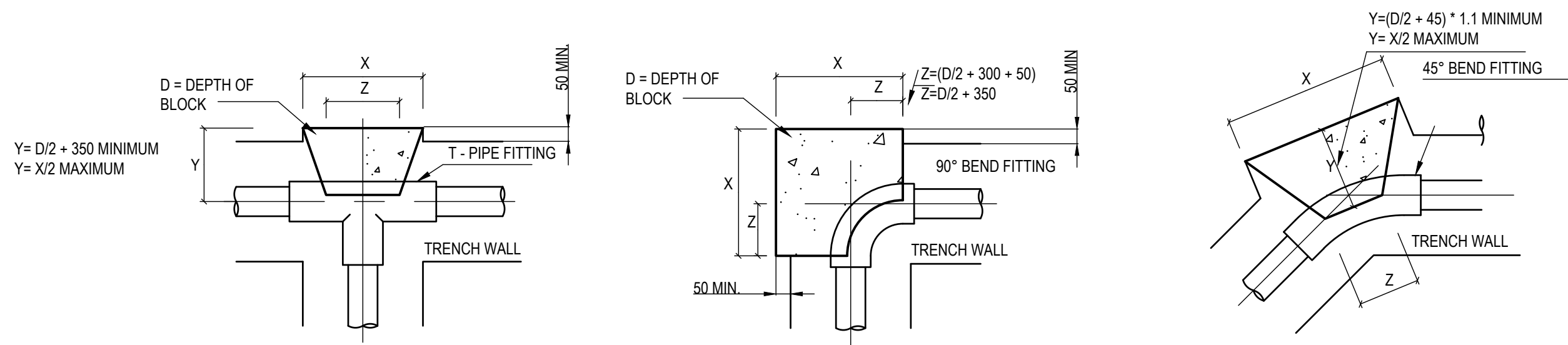


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STORMWATER MANHOLE DETAILS

SCALE	1:50	DATE	09/07/2024
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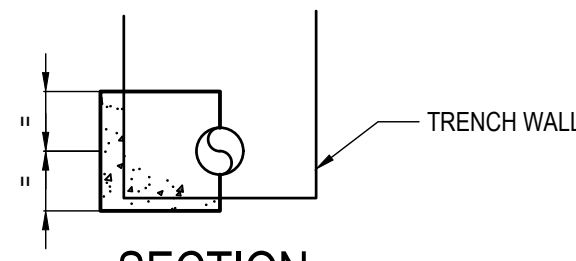


TEE CONNECTION THRUST BLOCK FOR PRESSURE PIPELINE

PIPE (mm)	X (mm)	D (mm)	Z (mm)
75	300	150	150
100	400	200	200
125	500	250	250
150	600	300	300
200	750	400	350
250	900	500	400
300	900	750	450
350	1000	900	500
400	1150	1000	550

90° BEND THRUST BLOCK FOR PRESSURE PIPELINE

PIPE (mm)	X (mm)	D (mm)	Z (mm)
75	560	225	175
100	660	300	250
125	730	375	300
150	825	450	400
200	925	600	475
250	1025	750	550
300	1075	900	575
350	1200	1050	600
400	1350	1200	600

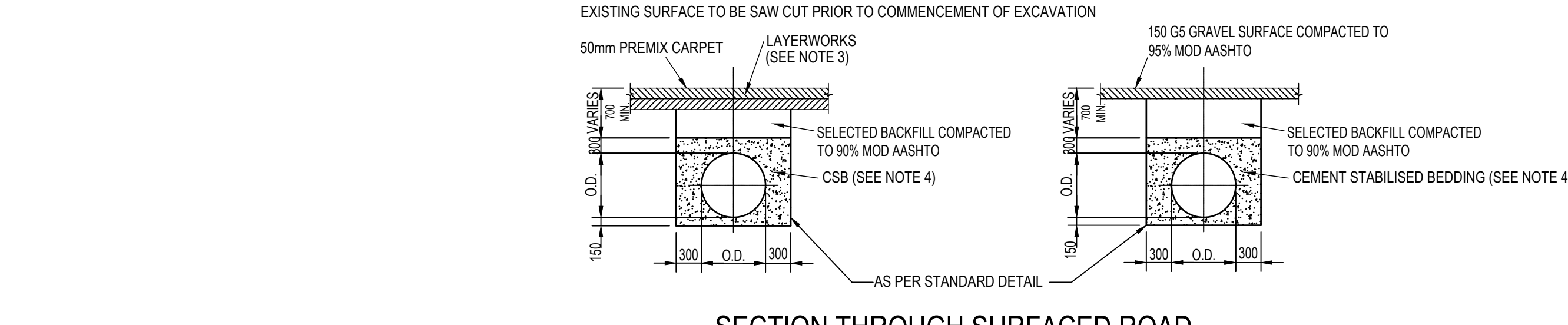


SECTION SCALE 1:10

45°/22.5° BEND THRUST BLOCK FOR PRESSURE PIPELINE

PIPE (mm)	X (mm)	D (mm)	Z (mm)
75	300	150	150
100	400	200	200
125	500	250	250
150	600	300	300
200	700	400	350
250	800	500	400
300	1000	600	450
350	1100	700	500
400	1200	800	550

- BACKSIDE OF ANCHOR BLOCK TO BE ON UNDISTURBED GROUND.
- CONCRETE GRADE 15/19 FOR ALL THRUST BLOCK.
- THRUST BLOCKS SUITABLE FOR A MAXIMUM INTERNAL PIPE PRESSURE OF 500 kPa



SECTION THROUGH SURFACED ROAD

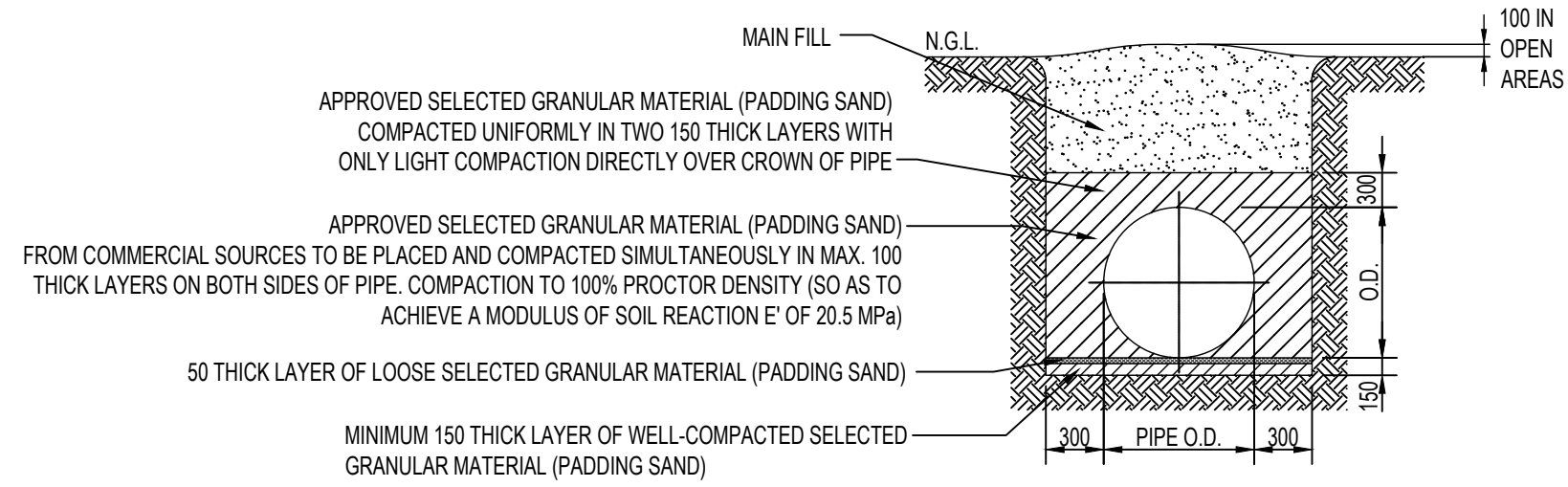
TYPICAL ROAD CROSSING DETAILS

SCALE 1:10

SECTION THROUGH GRAVEL ROAD

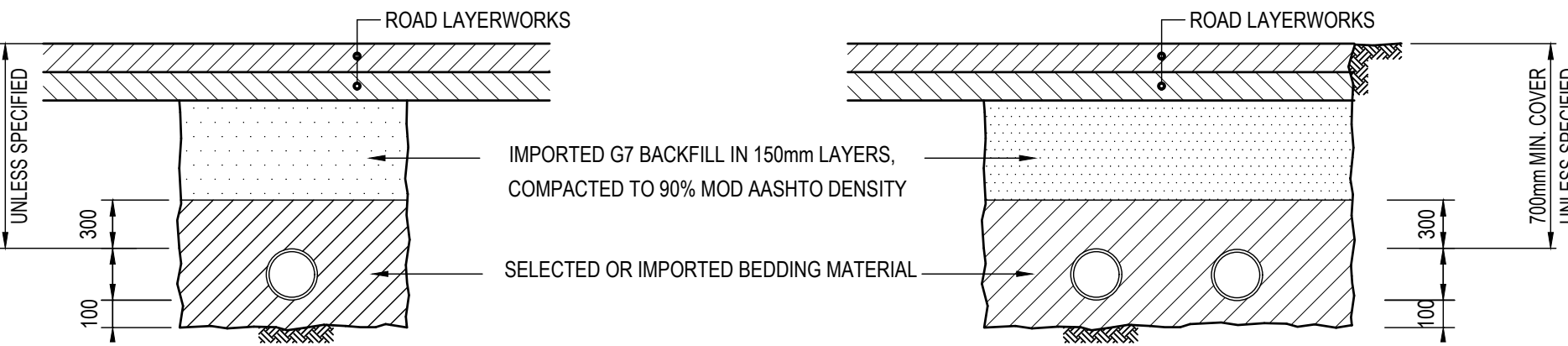
NOTES:

- CROSSING TO BE APPROVED BY ROAD AUTHORITY.
- VEHICULAR AND PEDESTRIAN THROUGH TRAFFIC SHALL BE ACCOMMODATED AT ALL TIMES.
- UNDERPASS FOR SURFACED ROADS.
- SUB GRADE - 300 SELECTED MATERIAL TO 90% MOD AASHTO.
- SUB BASE - 300 APPROVED CRUSHER RUN TO 90% MOD AASHTO.
- BASE - 100 APPROVED CRUSHER EXCAVATION TO 90% MOD AASHTO.
- CEMENT STABILISED BEDDING.
- COMPACTED SELECTED BEDDING FROM COMMERCIAL SOURCES WITH 6% CEMENT CONTENT F AND WHERE ORDERED BY THE ENGINEER.
- CEMENT STABILISED ENCASEMENT TO EXTEND A MIN. OF 3000 BEYOND SIDE OF DRAINAGE OR DRAINAGE WORKS, WHICHEVER IS FARTHEST FROM THE ROAD CENTRE UNLESS OTHERWISE DIRECTED IN LTR.



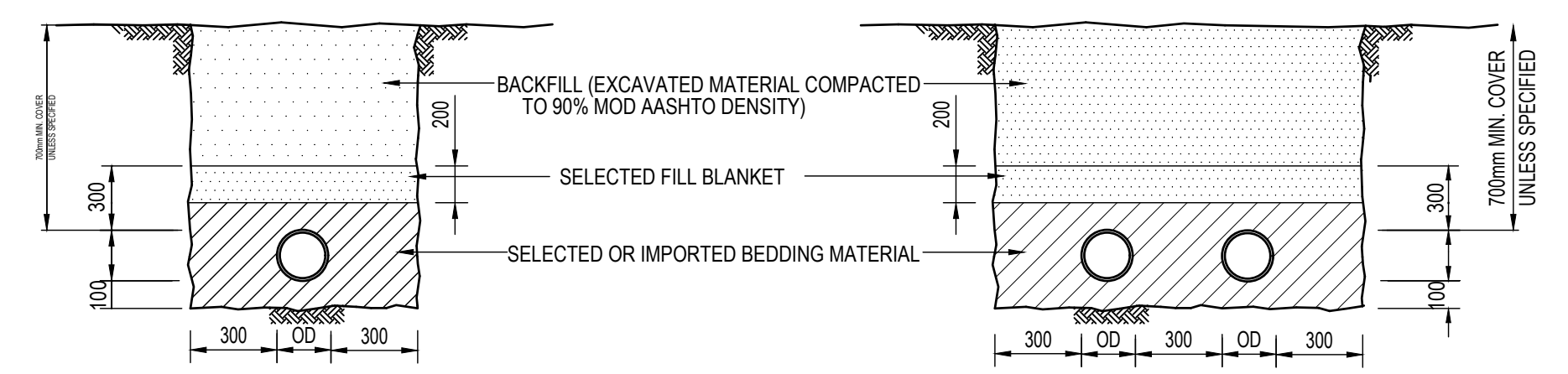
TYPICAL PVC PIPE BEDDING DETAILS

SCALE 1:10



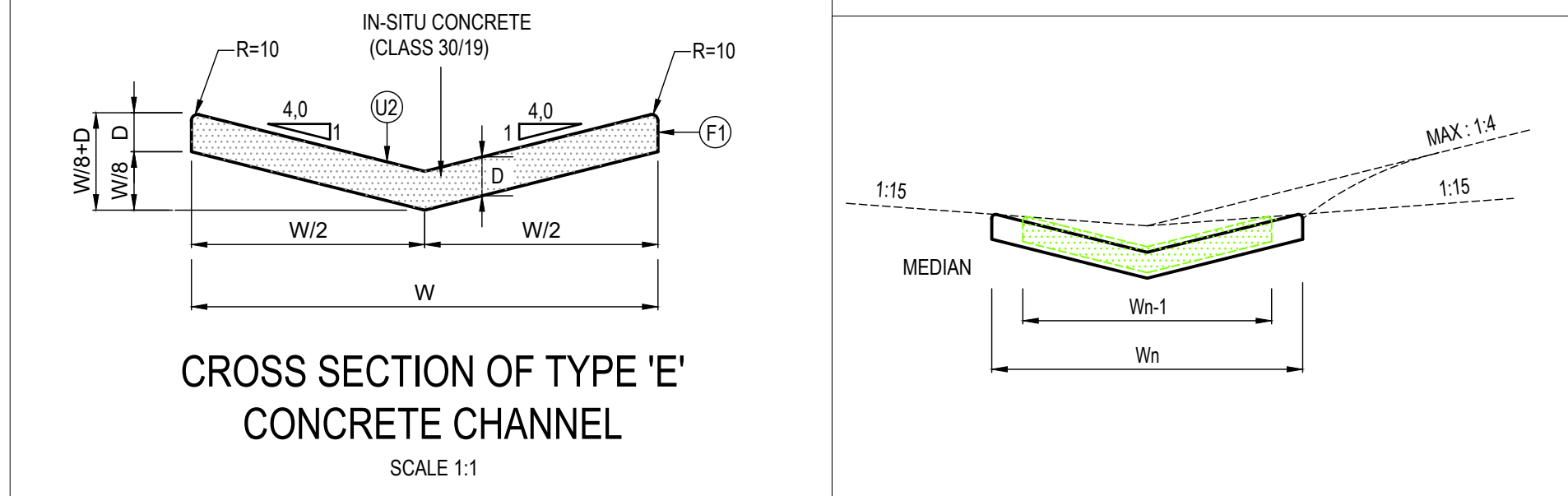
BEDDING UNDER ROADWAYS

SCALE 1:10



BEDDING NOT UNDER ROADWAYS TRENCH DETAILS

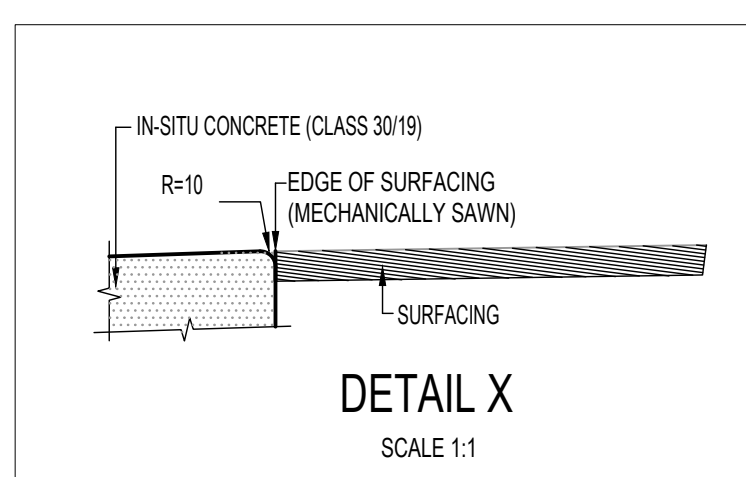
SCALE 1:10



CROSS SECTION OF TYPE 'E' CONCRETE CHANNEL

SCALE 1:1

POSITION OF TYPE 'E' CONCRETE CHANNEL



DETAIL X

SCALE 1:1

- NOTES:
- ALL CONCRETE CHANNELS AND OTHER DRAINAGE STRUCTURES ON THIS PLAN TO BE CAST USING CLASS 30/19 CONCRETE.
 - TYPES 'E' AND 'F' CONCRETE MUST BE CAST IN ALTERNATIVE LENGTHS OF 2.0m MAXIMUM WITH EXPANSION JOINTS EVERY 5m PANEL (10 m).
 - ALL EXPOSED CORNERS MUST BE ROUNDED OF TO A MINIMUM RADIUS OF 10mm.
 - THE TYPE OF SURFACE FINISH IS INDICATED AS F1 & U2.
 - F - FORMED SURFACES
 - U - UNFORMED SURFACES
 - PRECAST KERBING FIG. 5 & FIG. 7 REFER SANIS. 907

W	W/2	W8	W8+D	D UNREINFORCED	D REINFORCED
1000	500	125	250	125	100
1500	750	188	313	125	100
2000	1000	250	400	150	100
2500	1250	313	463	150	100

DIMENSIONS OF TYPE 'E' CONCRETE CHANNELS

W	X	Y	Z	D UNREINFORCED	D REINFORCED
1000	670	330	110	125	100
1500	1000	500	170	125	100
2000	1330	670	220	150	100
2500	1670	830	280	150	100

DIMENSIONS OF TYPE 'F' CONCRETE CHANNELS

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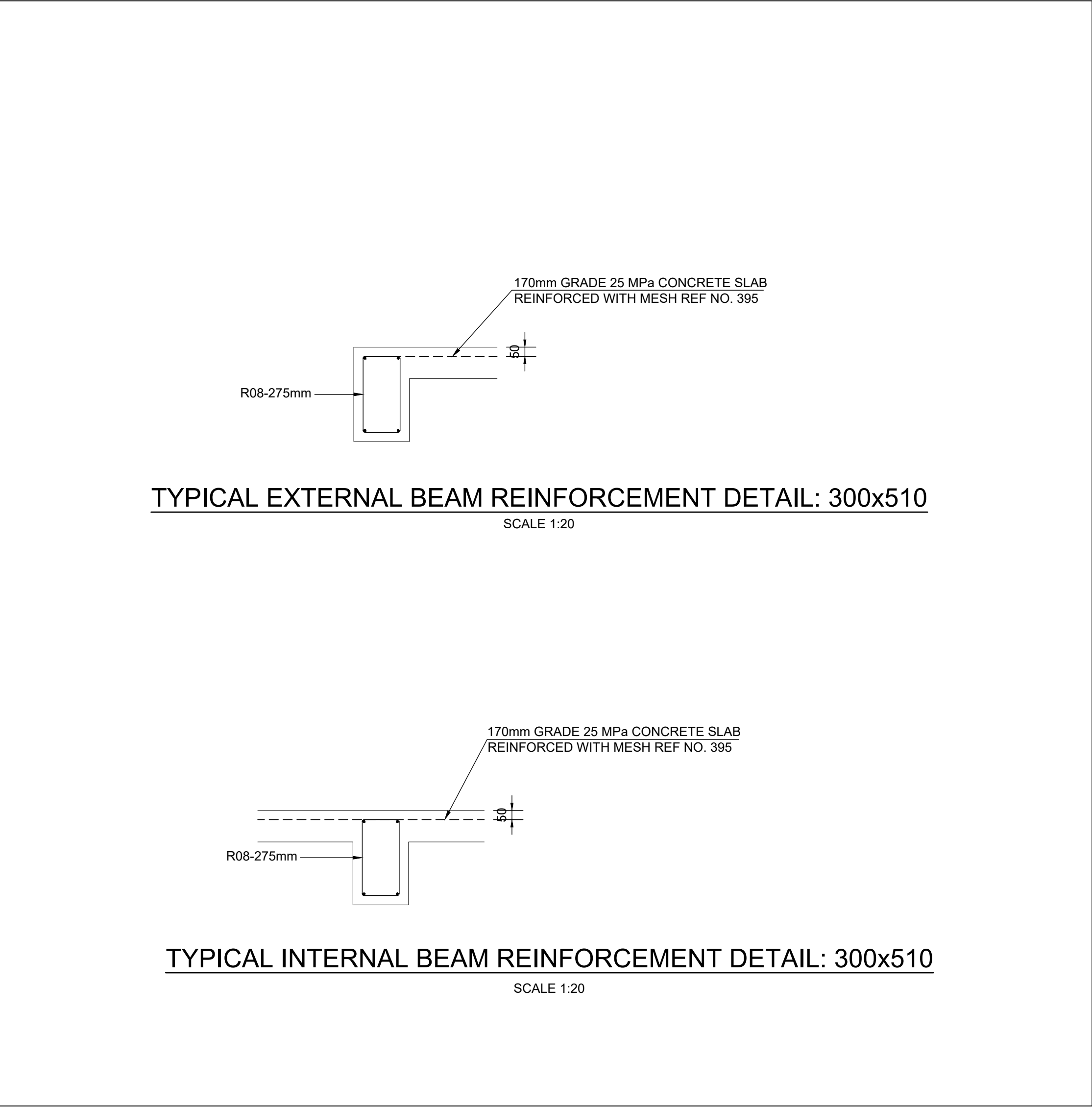
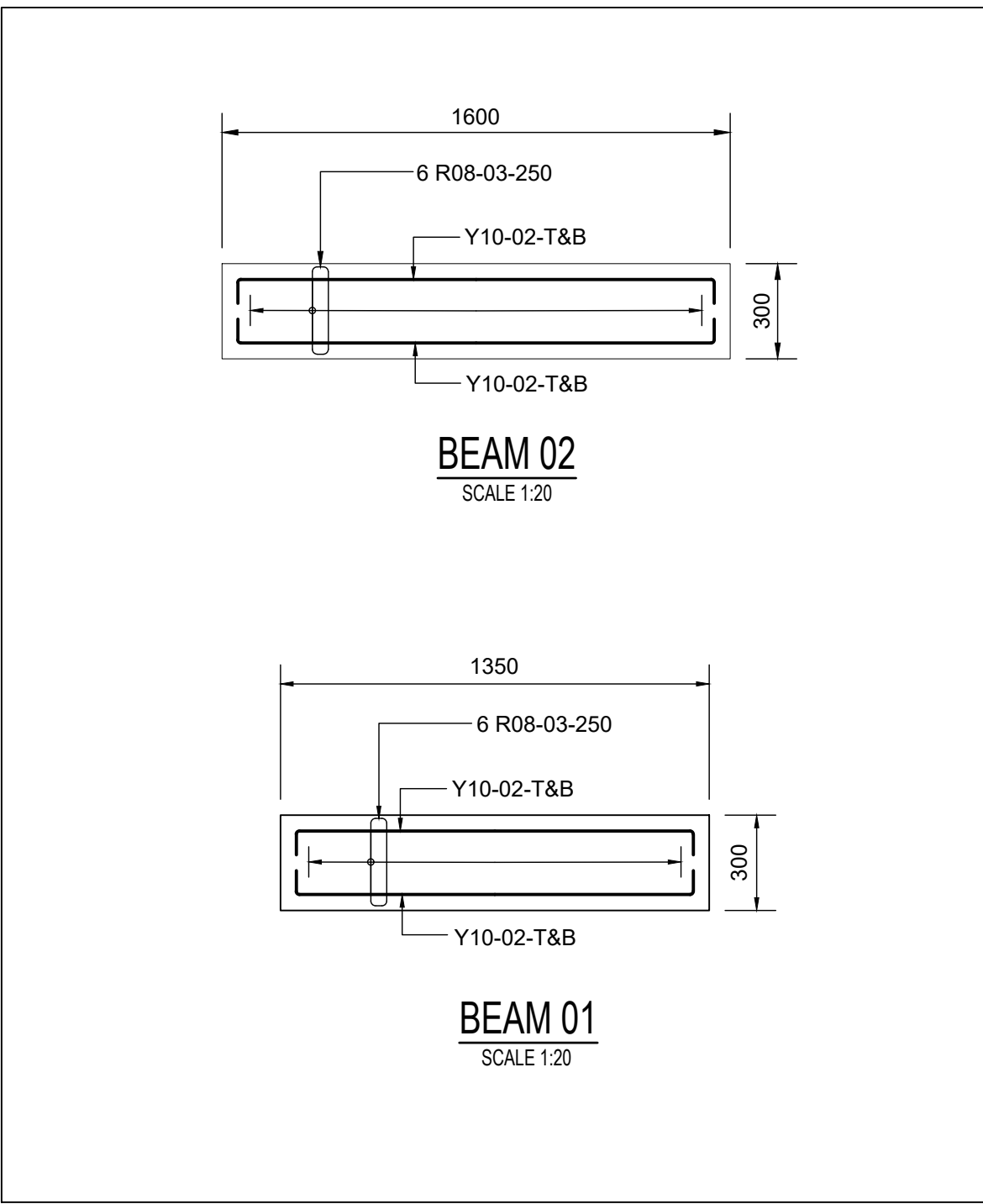
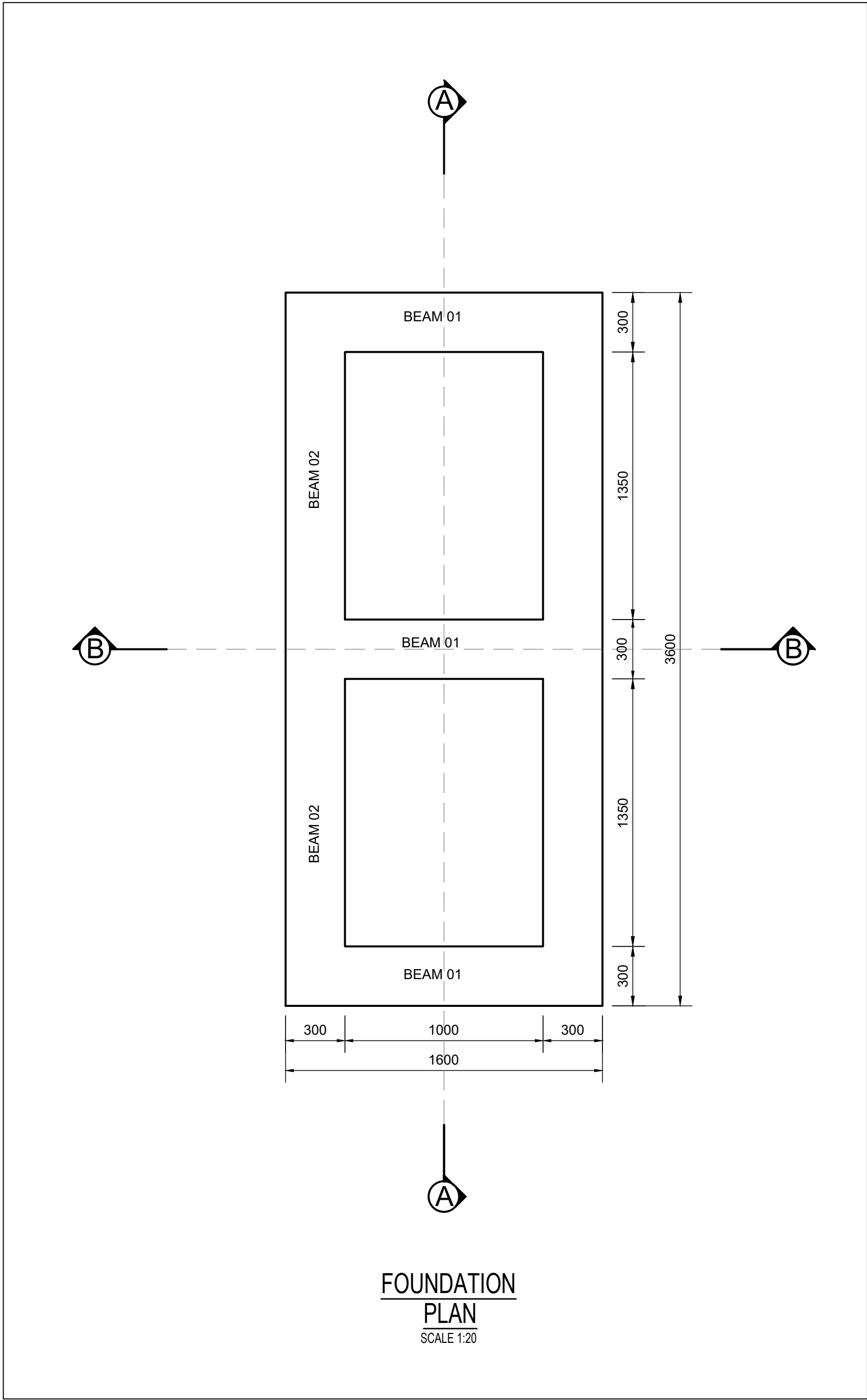
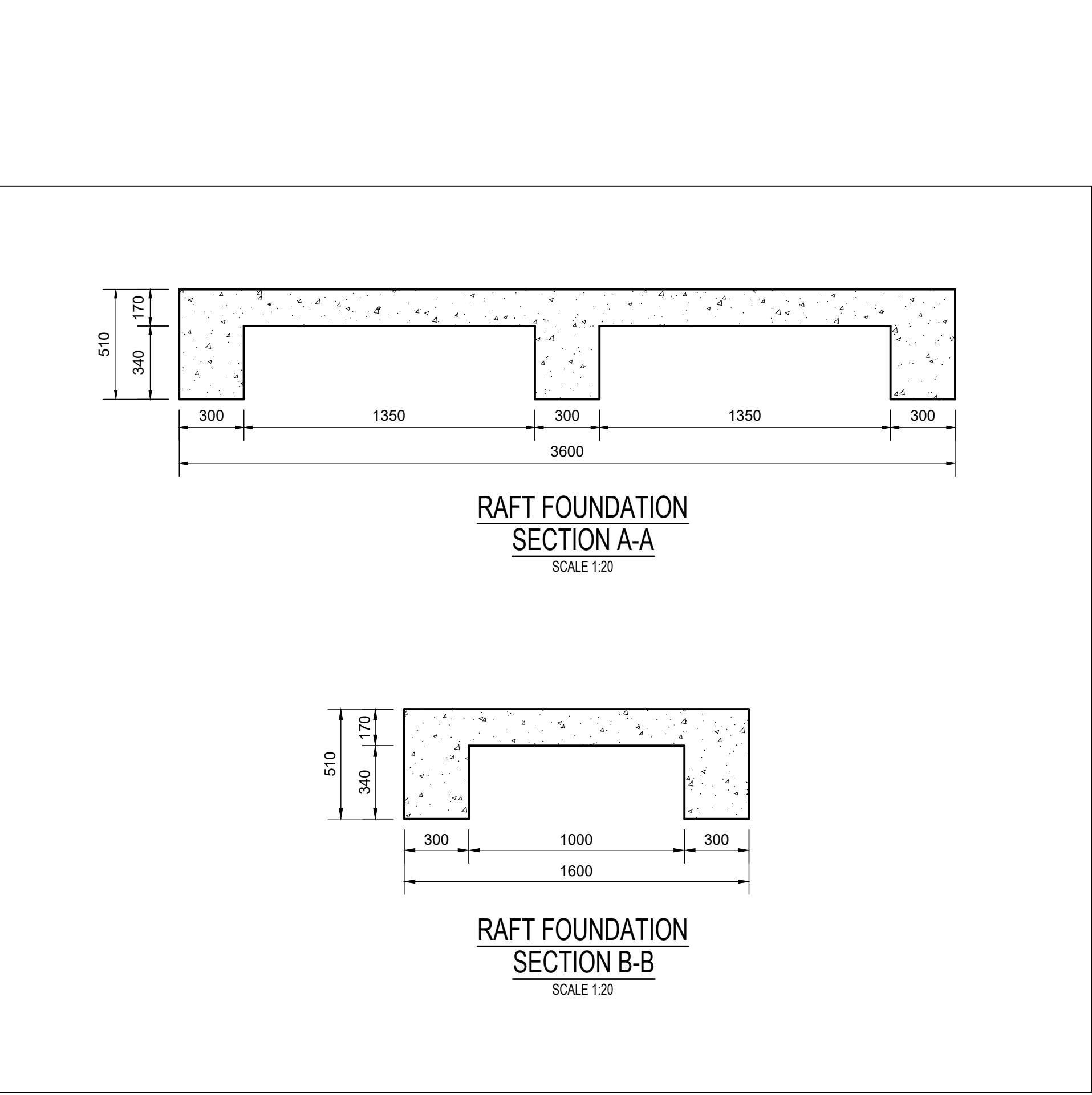
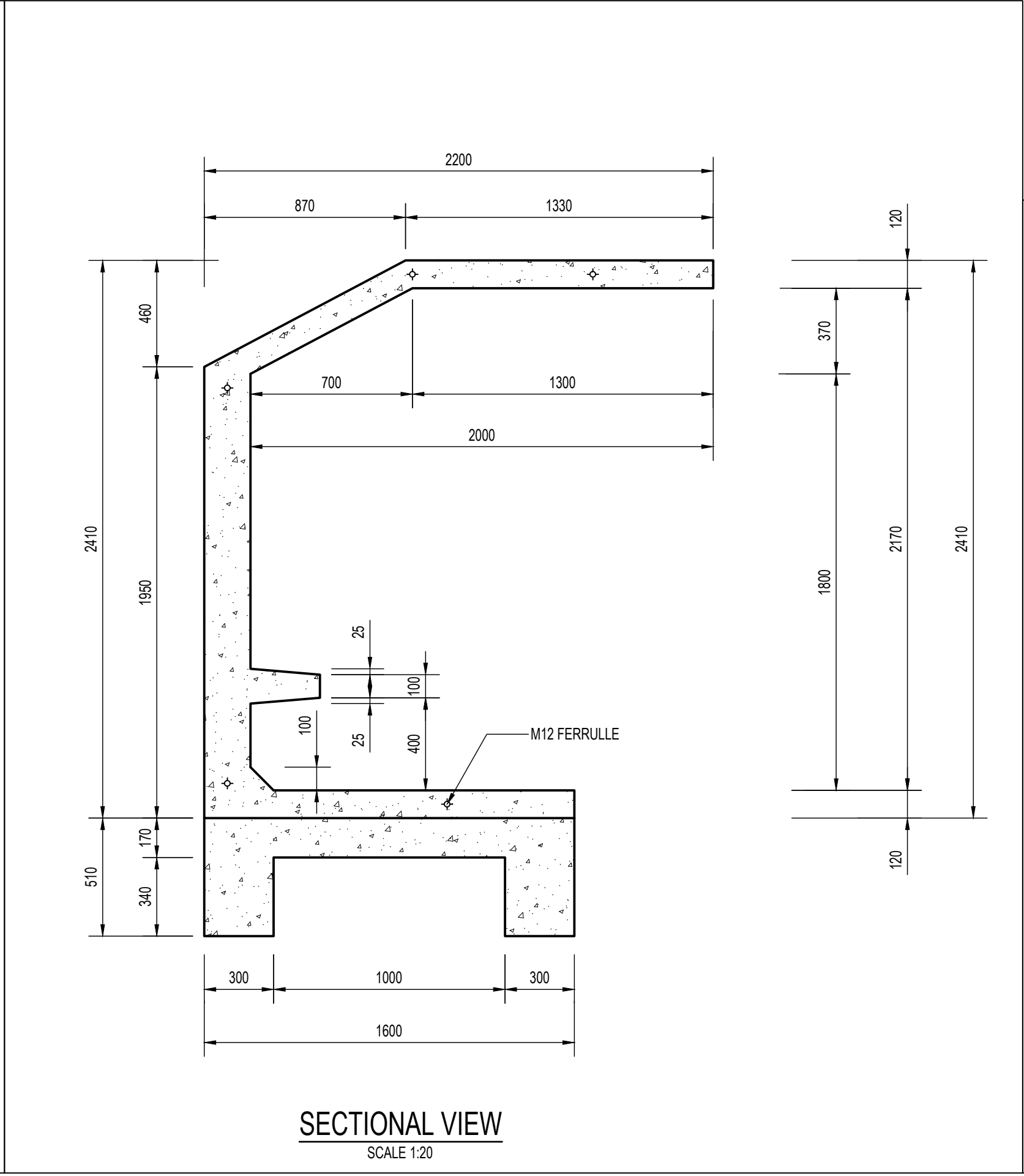
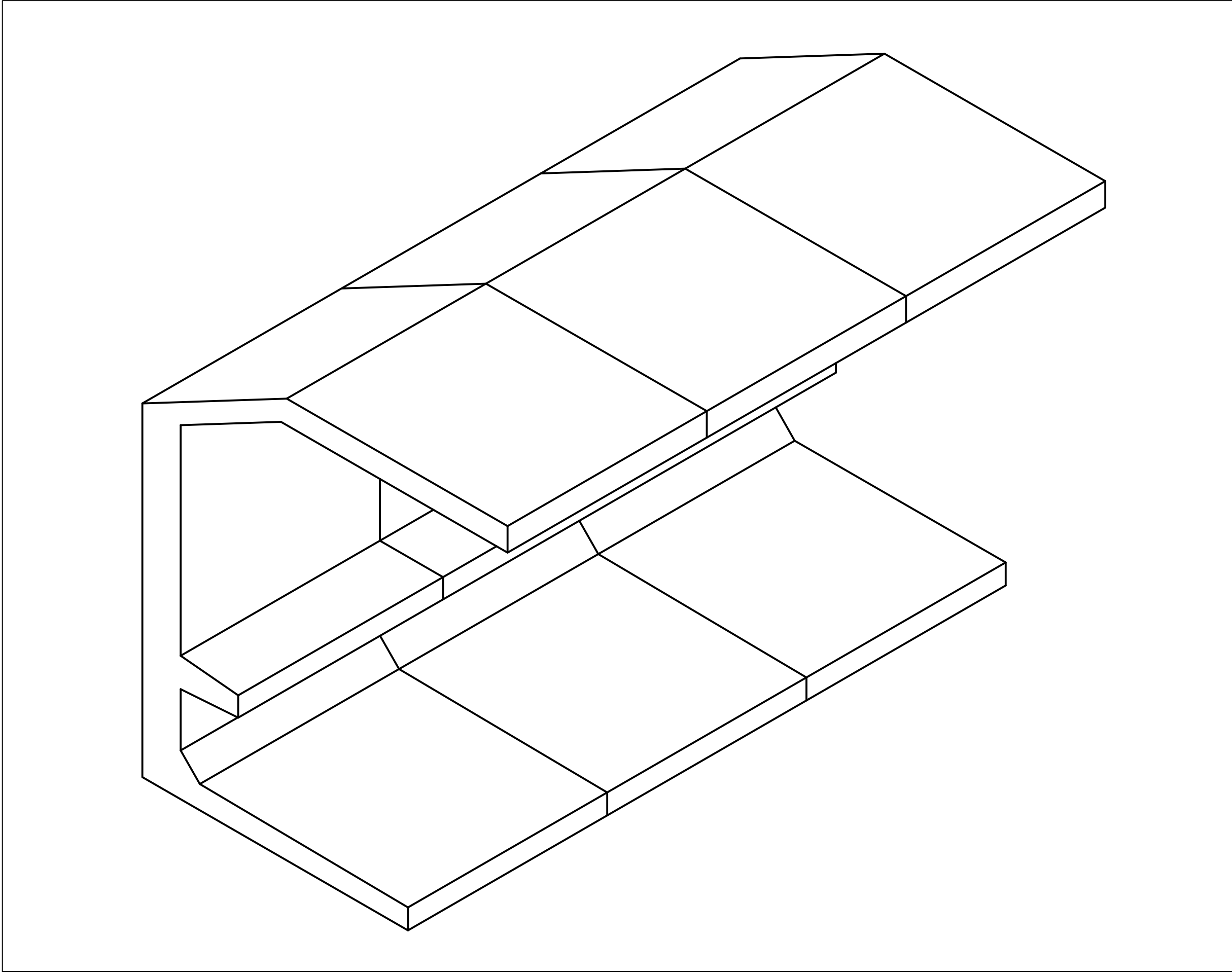
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CHECKED	CIVIL ENGINEER
CLIENT	SIGNATURE SIGNATURE
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CIVIL ENGINEER	
REGISTRATION NUMBER	

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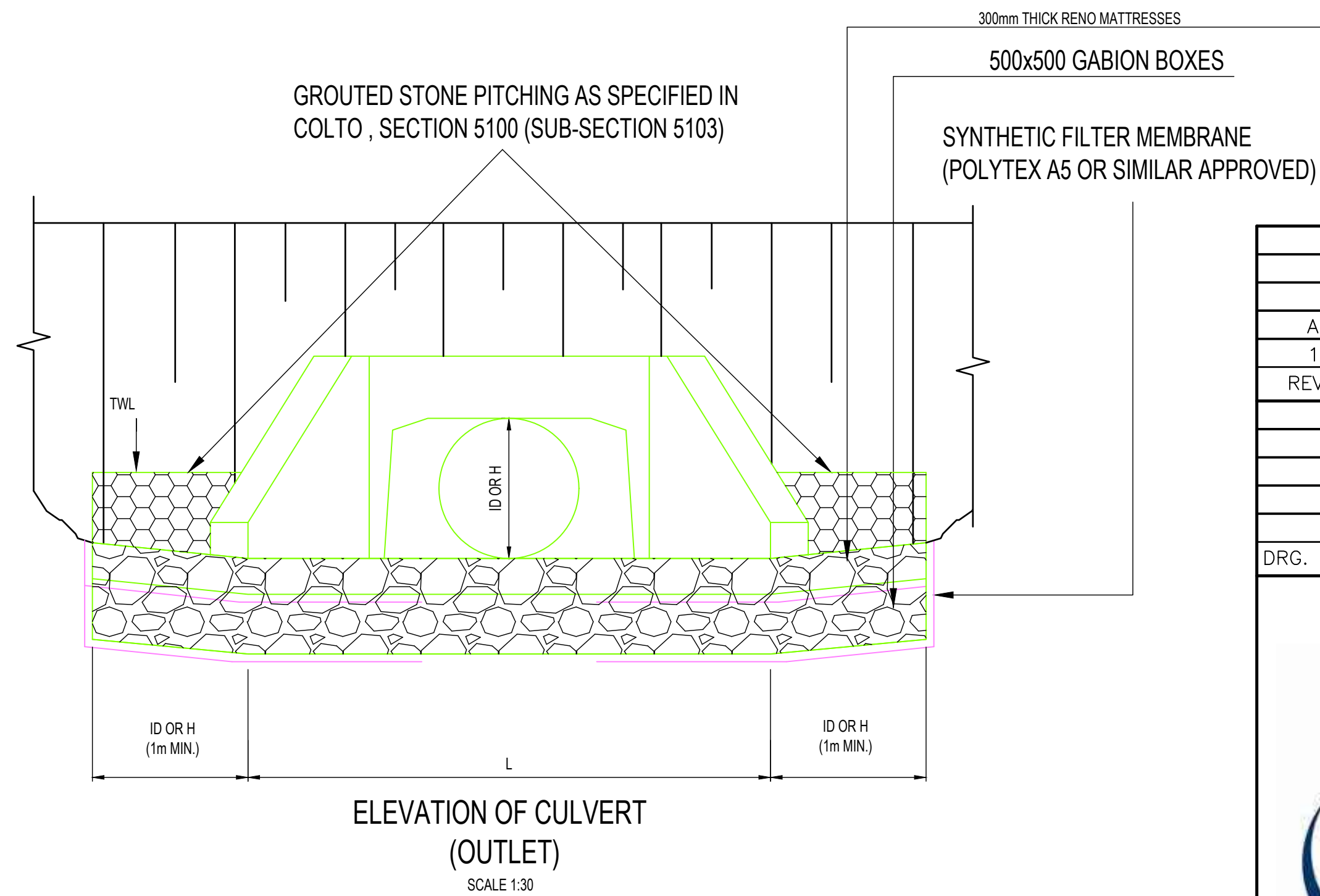
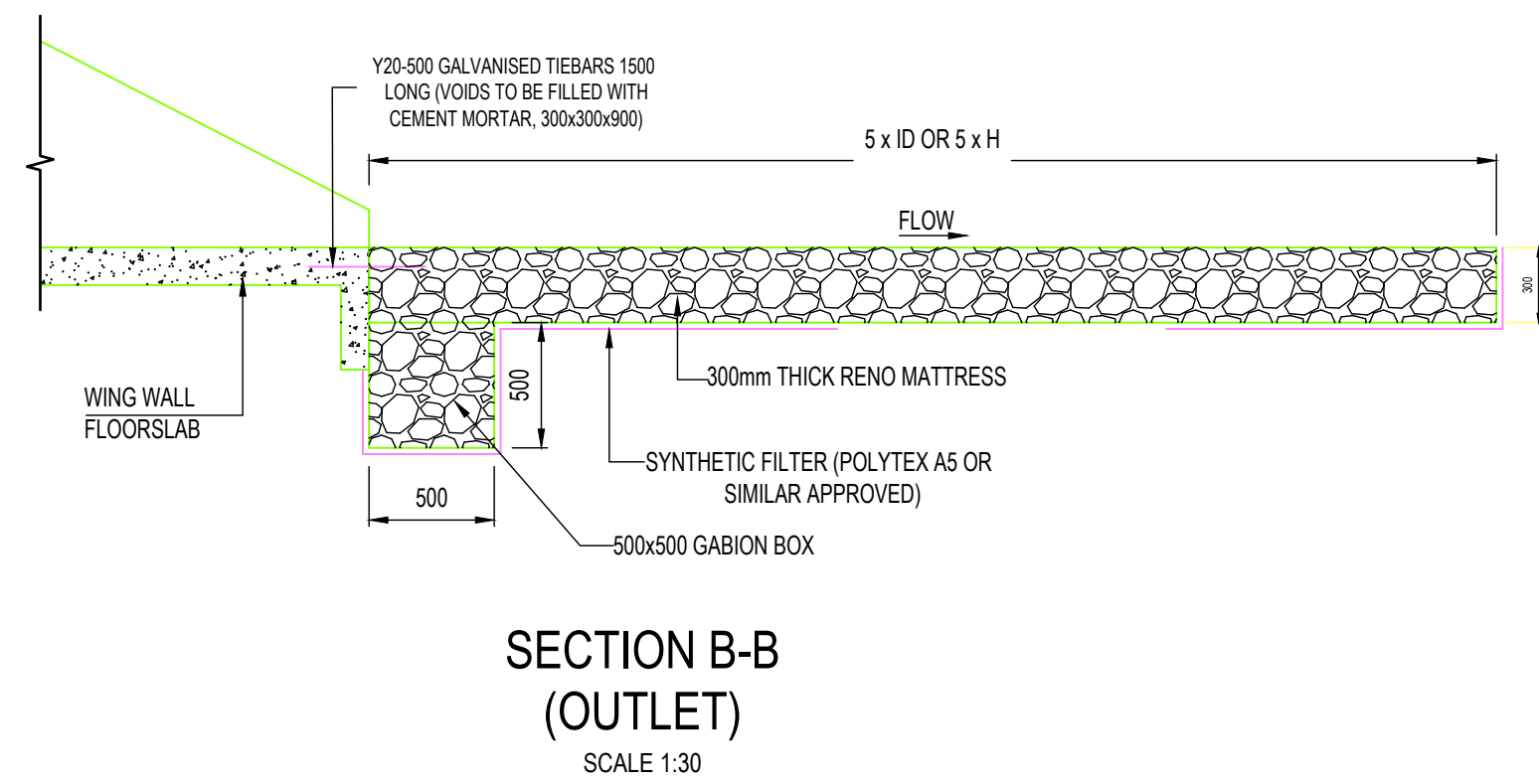
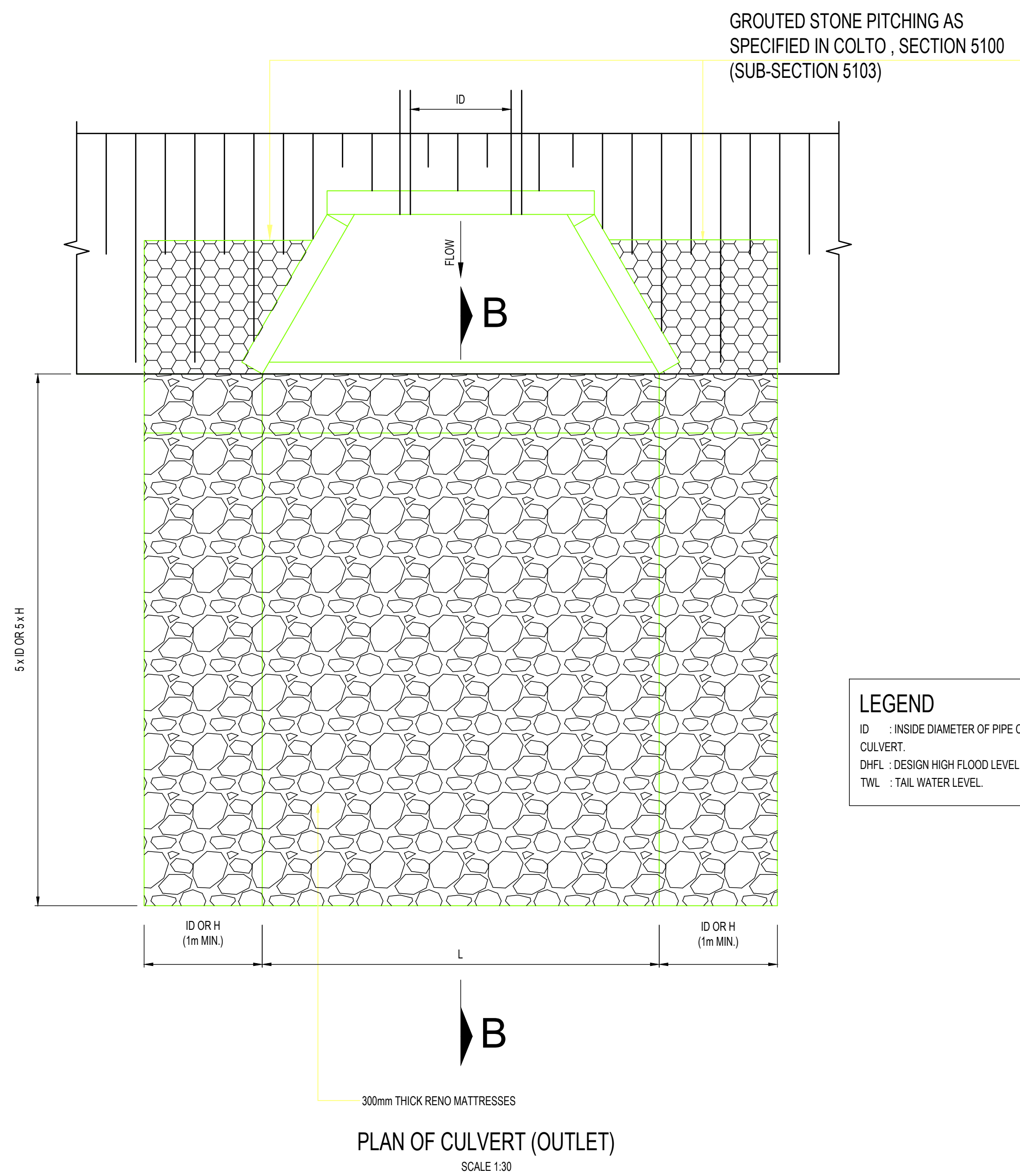
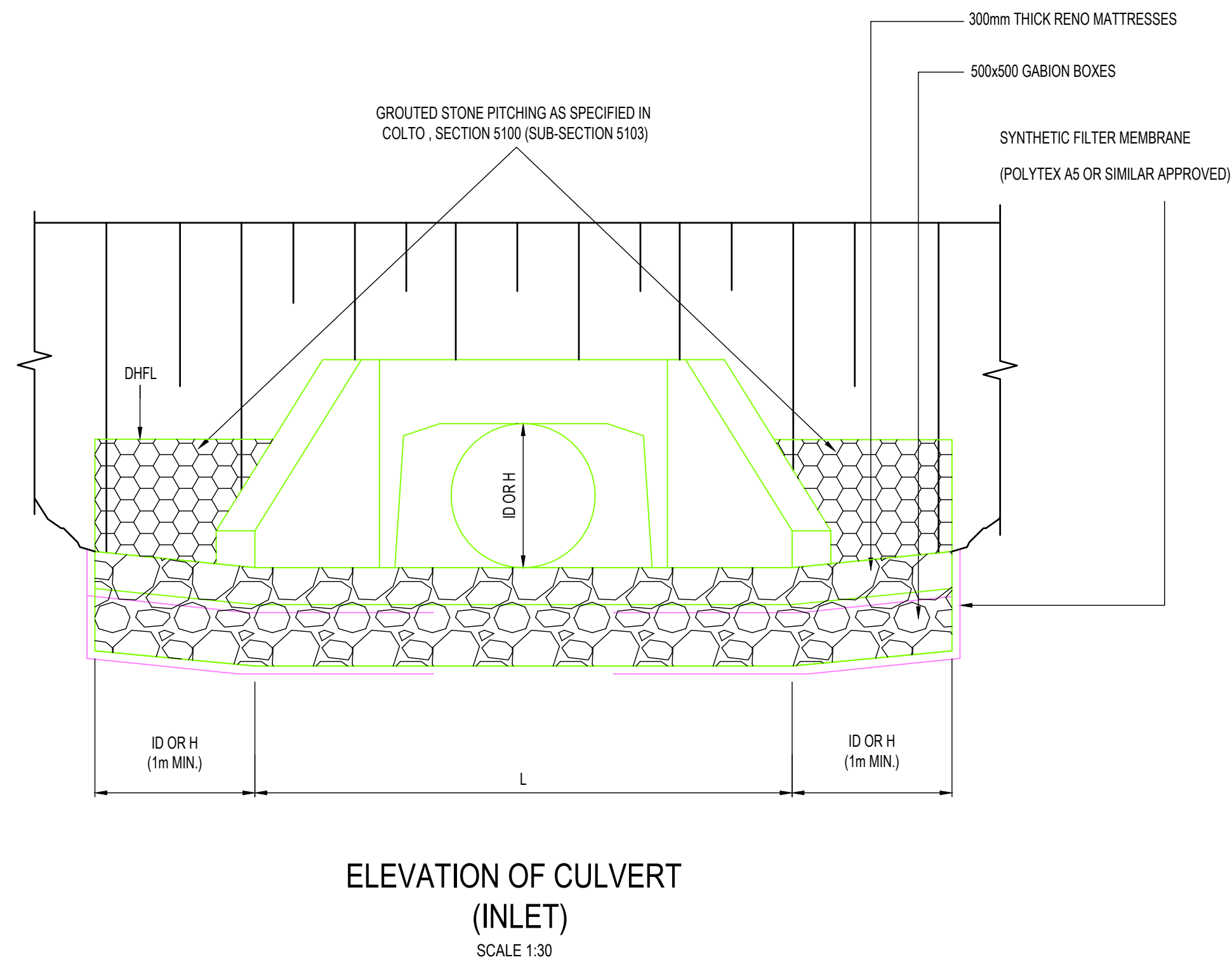
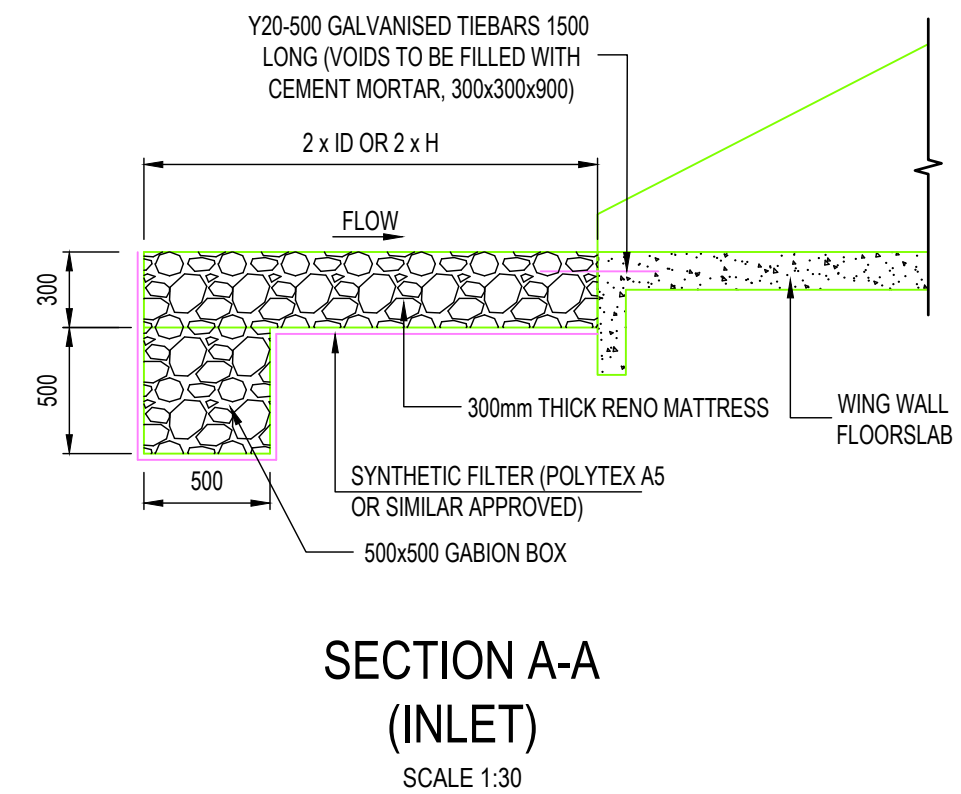
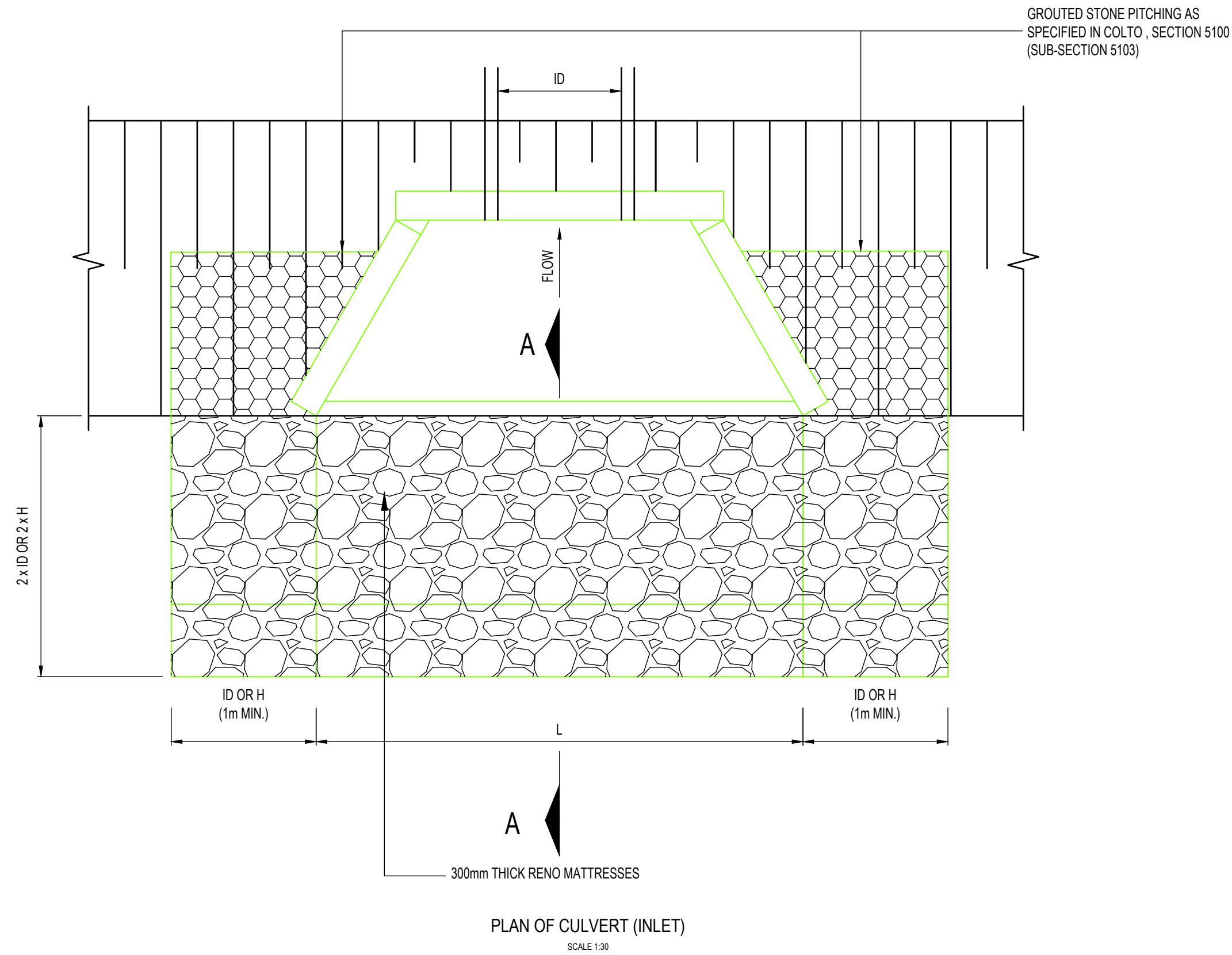
PIPE BEDDING AND DRAINAGE DETAILS

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CIVIL ENGINEER		CATEGORY		
REGISTRATION NUMBER				
WMMLM INFRASTRUCTURE & ROAD CONDITION ASSESSMENT				
BUS SHELTER REINFORCEMENT AND CONCRETE DETAILS				
SCALE 1:50		DATE 09/07/2024		
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43034/07/STD/010				



LEGEND
ID : INSIDE DIAMETER OF PIPE CULVERT. H : HEIGHT OF PORTAL CULVERT.
DHFL : DESIGN HIGH FLOOD LEVEL.
TWL : TAIL WATER LEVEL.

EROSION PROTECTION AT STORMWATER OUTLET STRUCTURE	
GUIDELINE FLOW VELOCITY (m/s)	PROTECTION MEASURE*
$V < 1.5$	FIELD GRASS
$1.5 < V < 3.5$	GRASS SEEDS
$3.5 < V < 6.5$	GABION MATTRESS (300mm)
$6.58 < V < 8$	GABIONS (500mm MIN)

NOTE
1. GABION BOXES AND RENO MATTRESSES (MACCAFERRI SA OR SIMILAR APPROVED) DIMENSIONS, SPECIFICATIONS AND ASSEMBLY DETAILS AS PER MANUFACTURERS REQUIREMENTS.
2. FOR GRASS, STONE PITCHING, CONCRETE AND STILLING BASIN EROSION PROTECTIVE MEASURES REFER TO CHAPTER 7 OF THE ROAD DRAINAGE MANUAL, 5th EDITION, 2006.

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STONE PITCHING

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