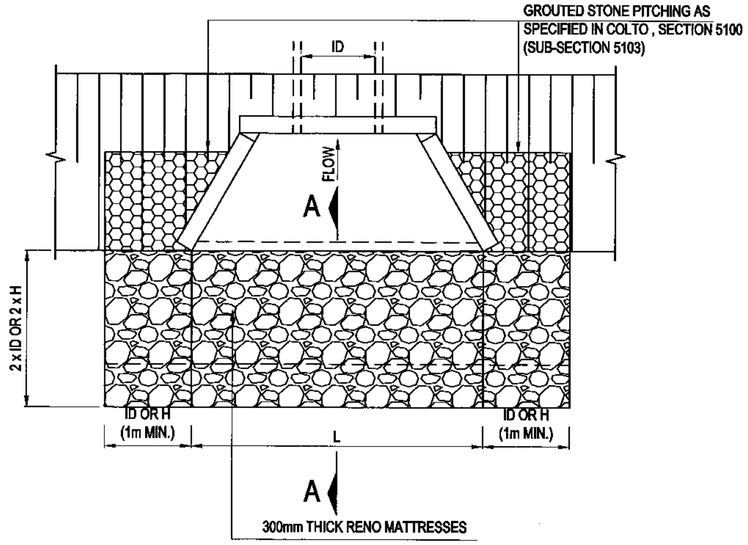
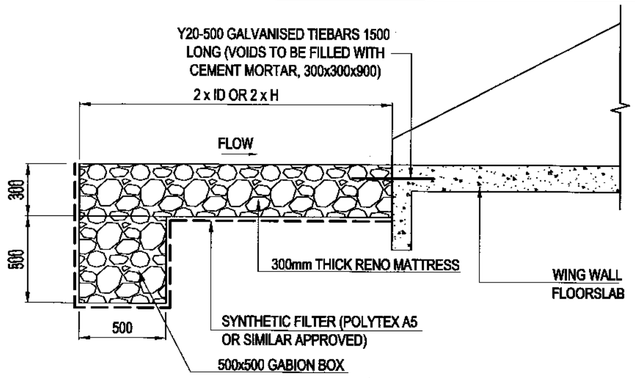


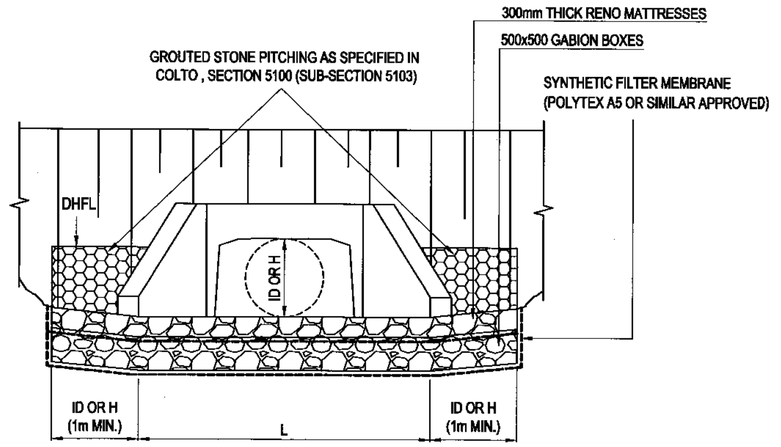
PLAN OF CULVERT (INLET)

SCALE 1:50



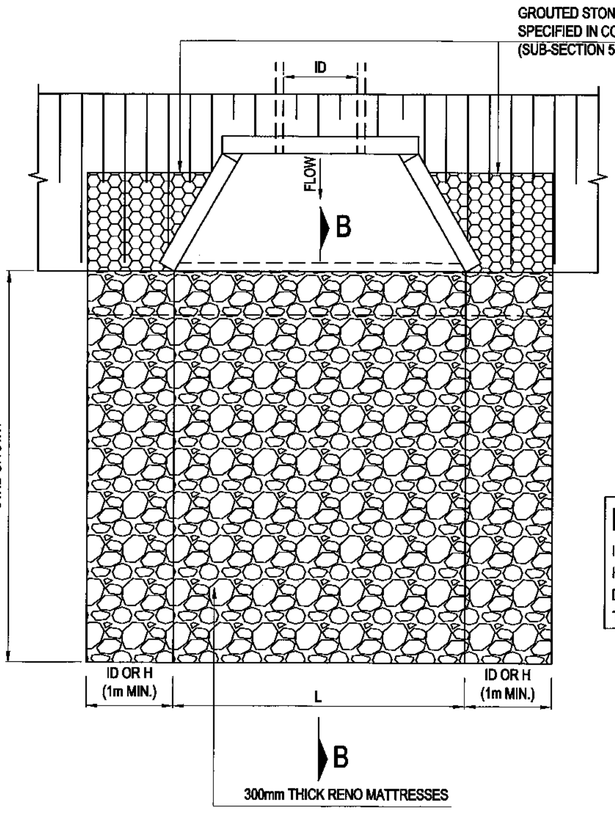
SECTION A-A (INLET)

SCALE 1:25



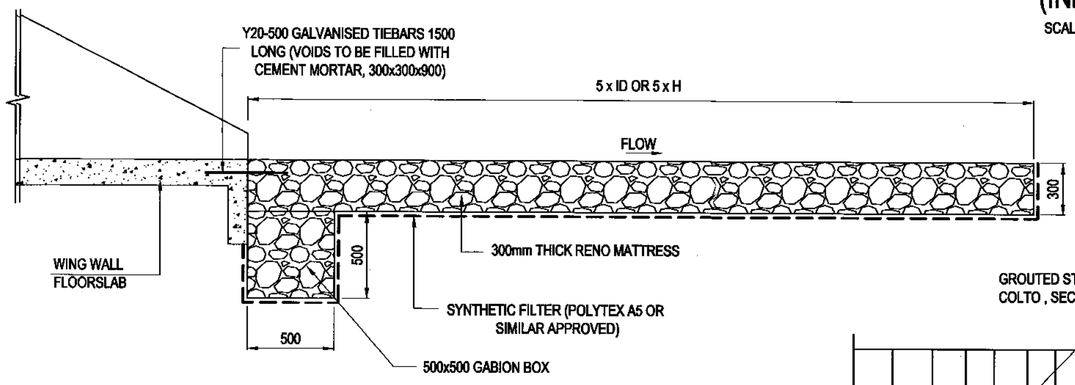
ELEVATION OF CULVERT (INLET)

SCALE 1:50



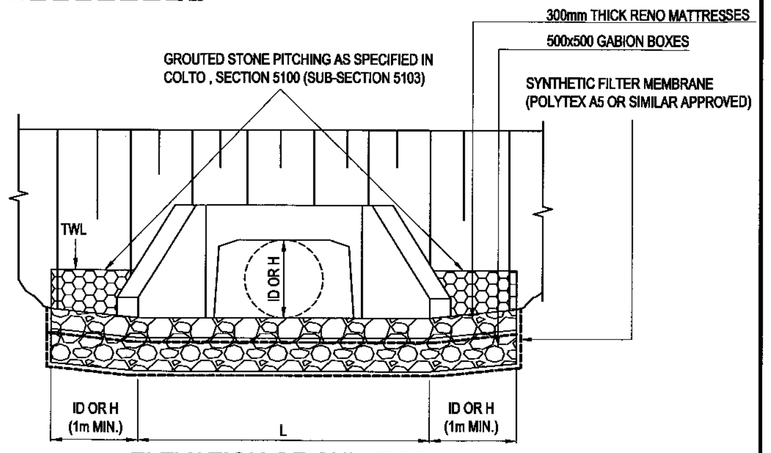
PLAN OF CULVERT (OUTLET)

SCALE 1:50



SECTION B-B (OUTLET)

SCALE 1:25



ELEVATION OF CULVERT (OUTLET)

SCALE 1:50

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 SODS
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.

FOR LATEST VERSION CHECK www.nra.co.za

No.	DATE	VERSION / REVISION	APPROVED
V1	SEPT 2014	ORIGINAL VERSION	

SANRAL TYPICAL DRAWINGS

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TYPICAL DRAWINGS - DRAINAGE

EROSION CONTROL
STONE PITCHING AND GABIONS
SHEET 3 OF 3

SANRAL DOC. No. (PDF)	1692527
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SANRAL DRAWING No.	TD-D-EC-1003-V1