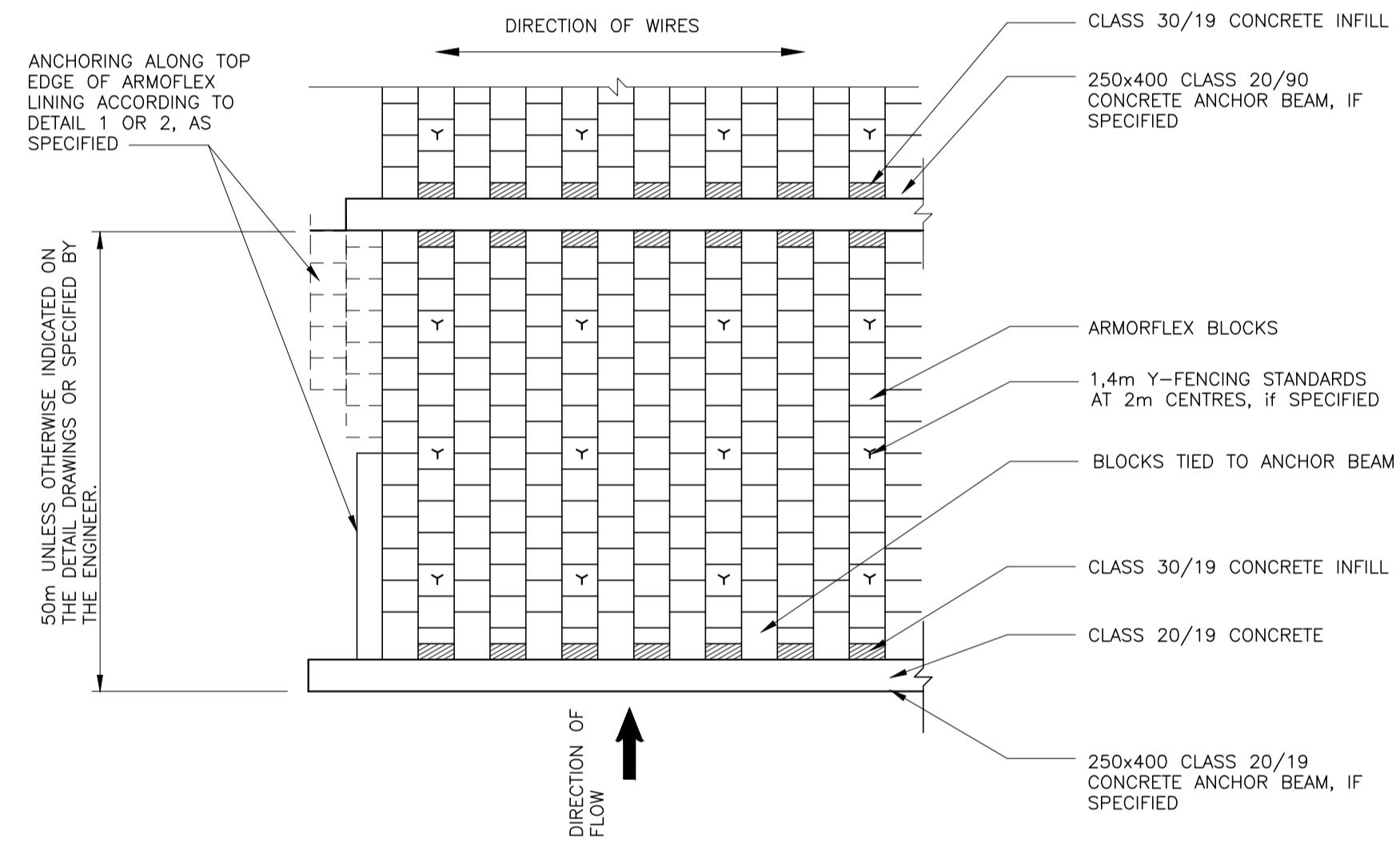
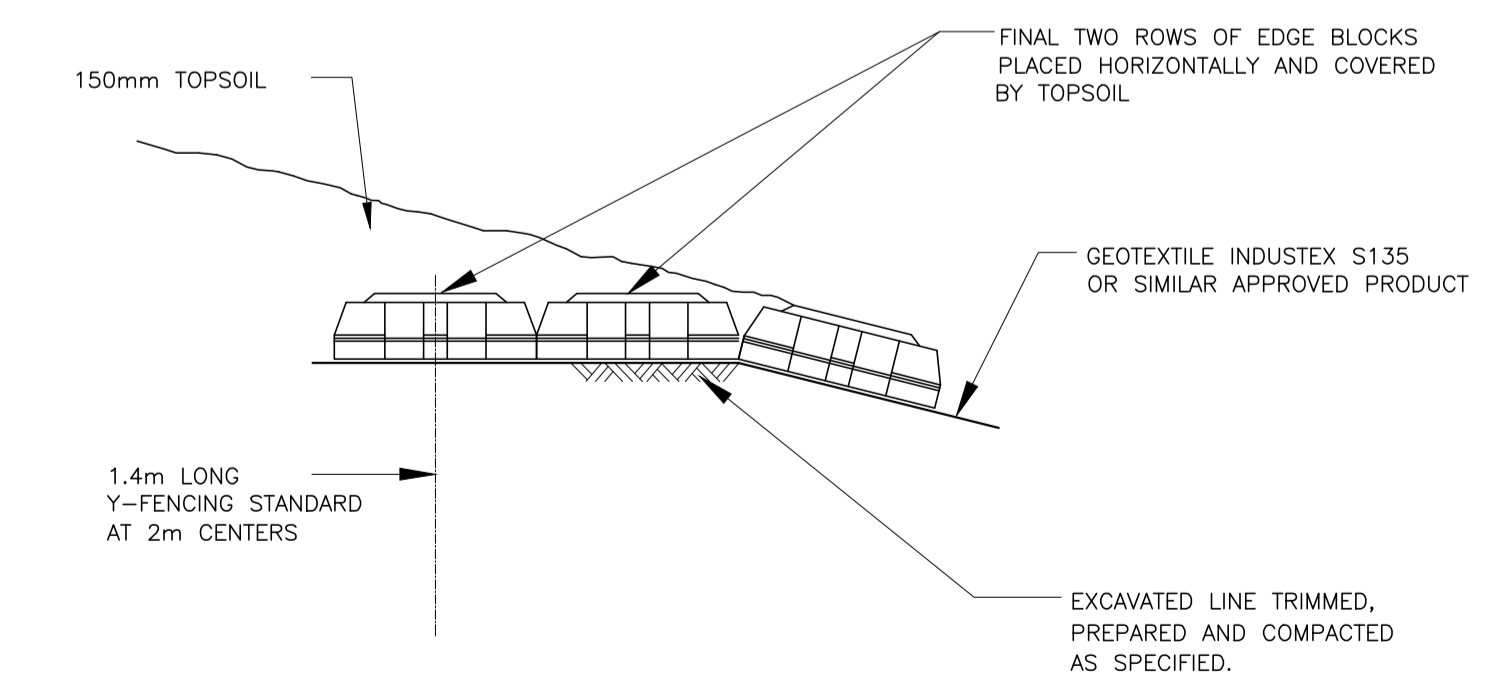


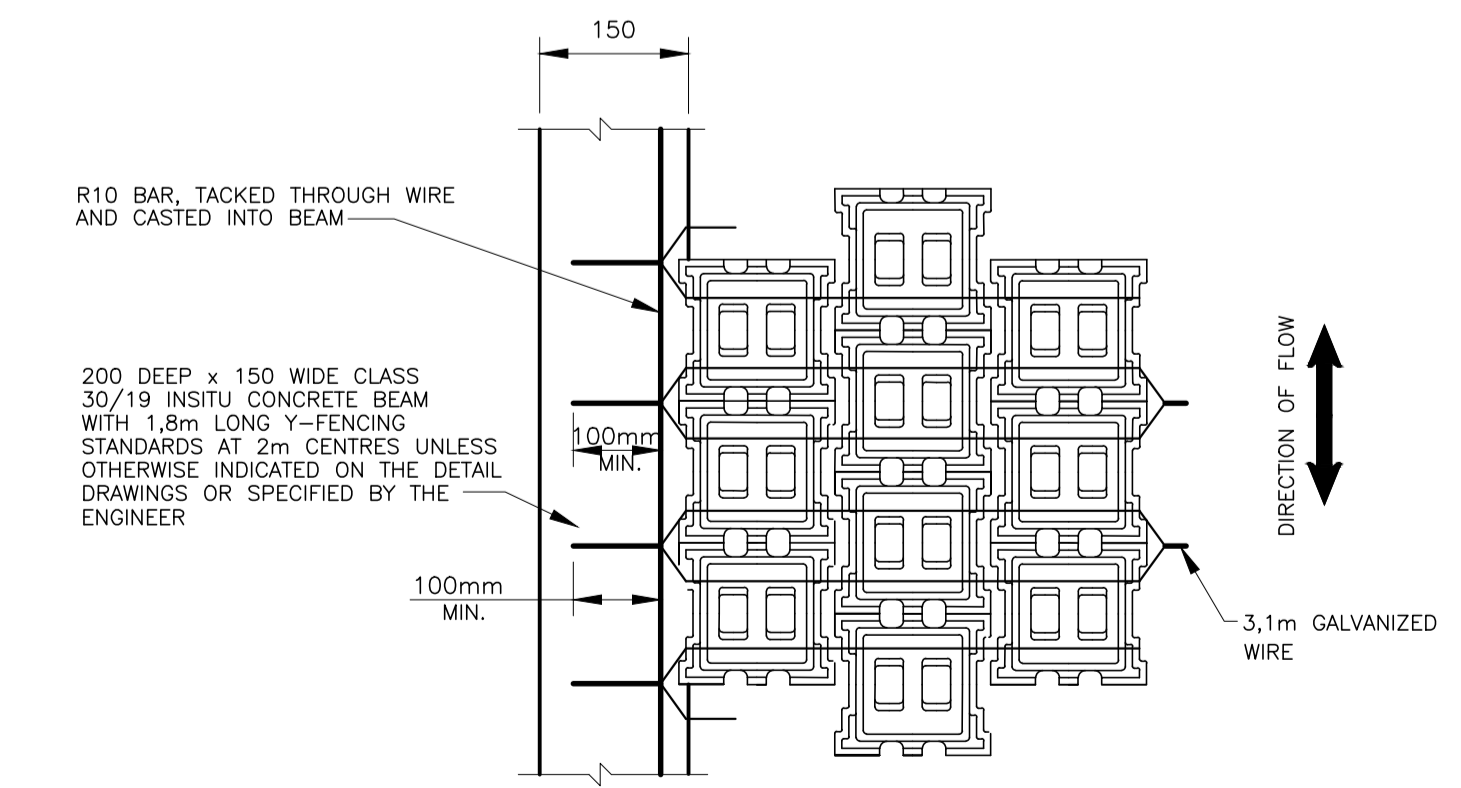
CHANNEL WITH ARMOFLEX LINING



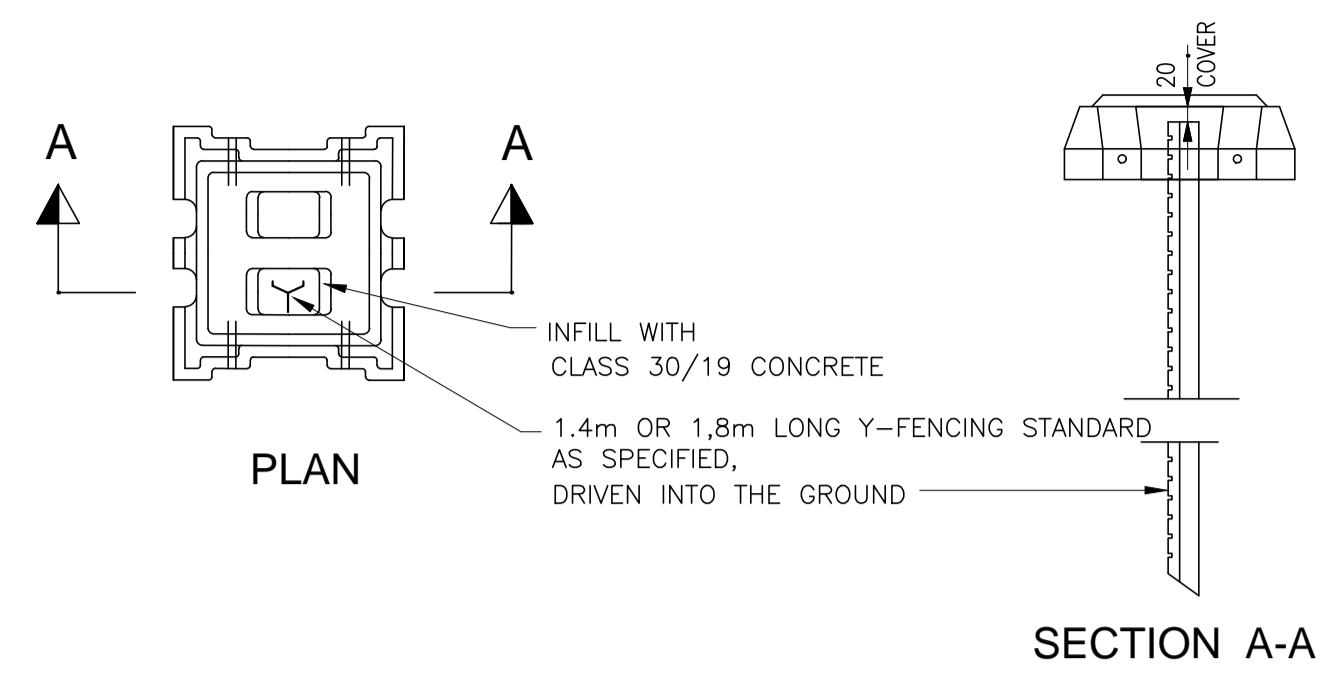
TYPICAL PLAN



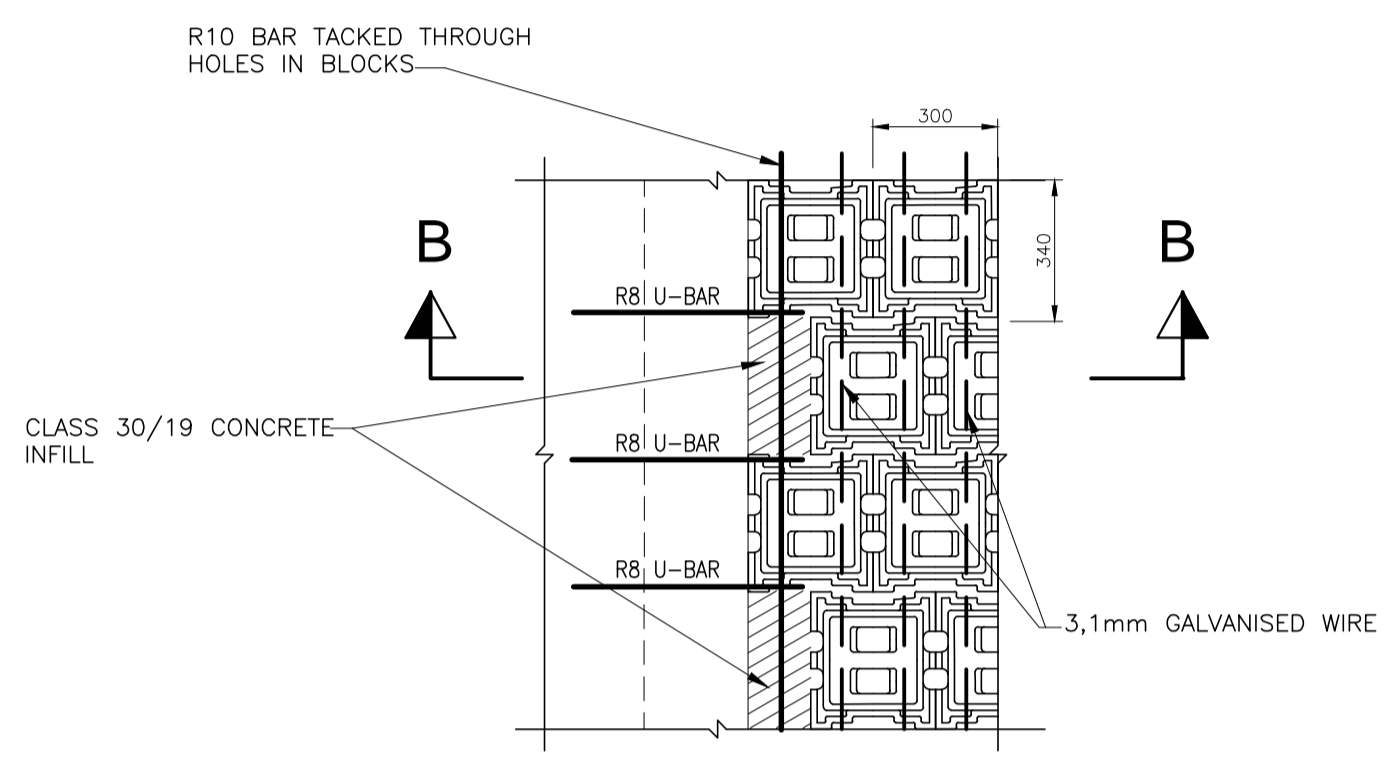
DETAIL 1 FOR ANCHORING ALONG TOP EDGE OF ARMOFLEX LINING: Y- FENCING STANDARDS



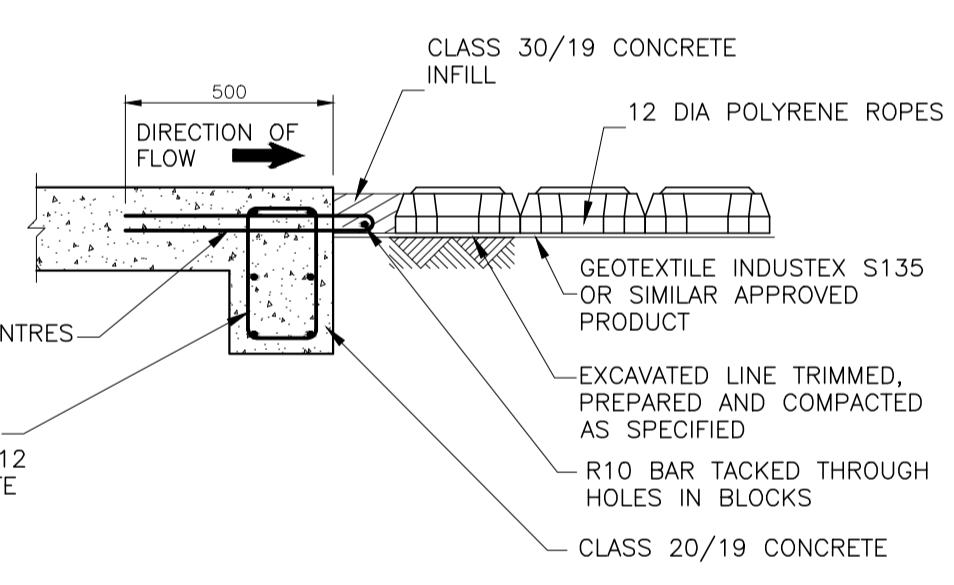
DETAIL 2 FOR ANCHORING ALONG TOP EDGE OF ARMOFLEX LINING: CONCRETE BEAM AND Y- FENCING STANDARDS



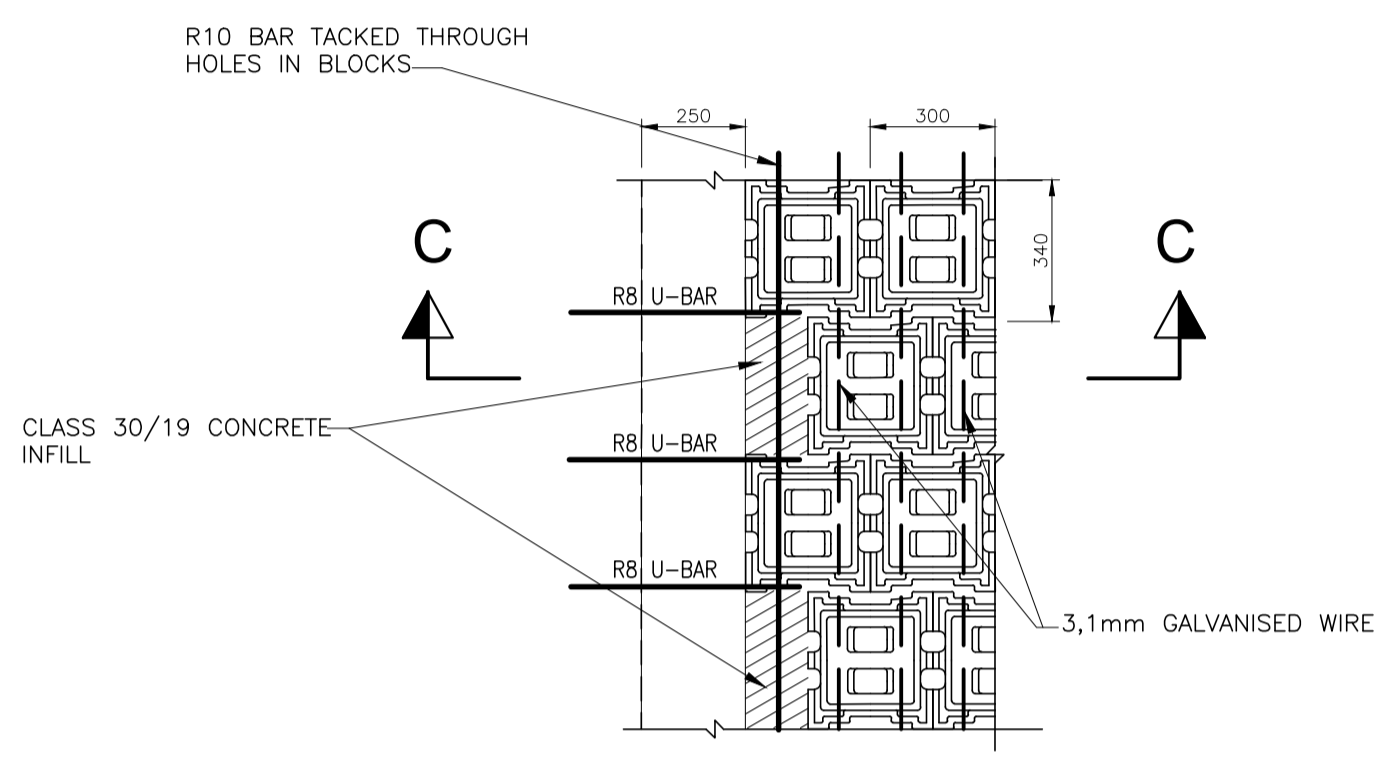
INTERMEDIATE ANCHORS



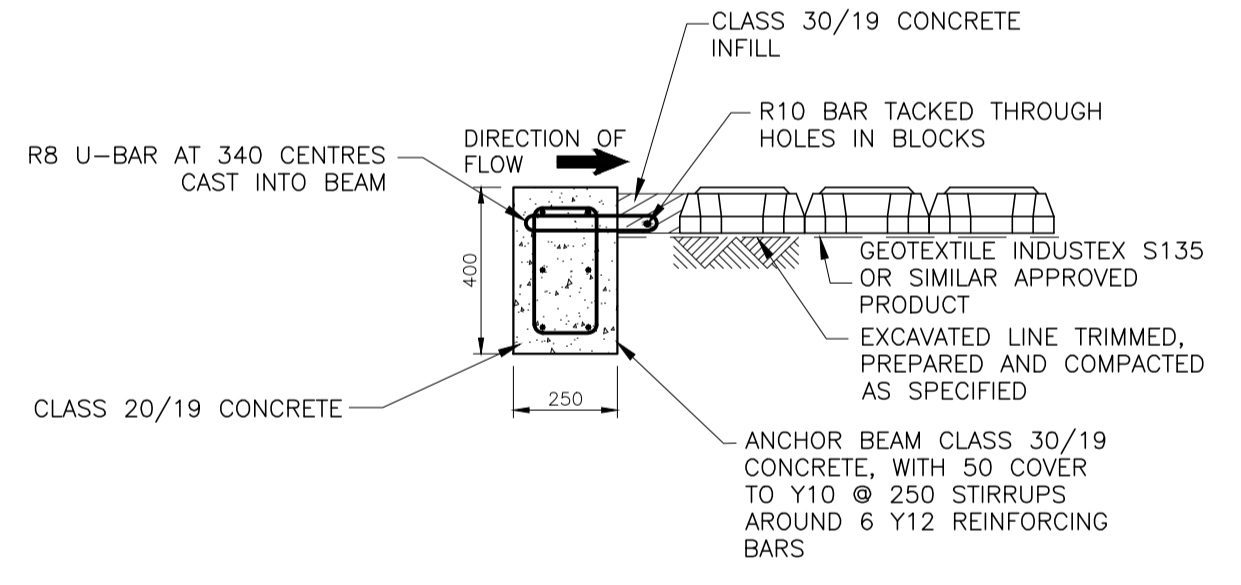
DETAIL FOR CONNECTION TO CULVERT OUTLET STRUCTURE



SECTION B-B



DETAIL FOR CONNECTION TO ANCHOR BEAM



SECTION C-C

NOTES AND SPECIFICATIONS

- NOTES FOR THE INSTALLATION OF ARMOFLEX BLOCKS**
- INTRODUCTION**
 1. ARMOFLEX BLOCKS 100 OR SIMILAR WILL BE LAID IN ACCORDANCE WITH THIS SPECIFICATION. EACH BLOCK SHALL BE FACTORY PRODUCED FROM COMPRESSED CONCRETE WITH VERTICAL HOLES AND TWO HORIZONTAL CABLE DUCTS. CONCRETE USED IN THE MANUFACTURE OF THE BLOCKS SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF NOT LESS THAN 30MPa. OUTSIDE DIMENSIONS IN MILLIMETERS SHALL BE 300 ± 1.0 . EACH BLOCK SHALL HAVE A MASS OF APPROXIMATELY 171 KG. THE INTERLOCKED BLOCKS SHALL HAVE A UNIT MASS OF 180kg/m².
 2. ARMOFLEX BLOCKS TO BE Laid BY HAND UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 3. 3.1mm GALVANIZED WIRE SHALL BE USED. THE WIRES ARE TO RUN AT RIGHT ANGLES TO THE DIRECTION OF FLOW.
 - PREPARATION OF EXPOSED SURFACES OF CANAL**
 1. THE BASE OF THE CANAL WILL BE PREPARED IN ACCORDANCE WITH THE LINES INDICATED ON THE DETAIL DRAWINGS. THE FINISHED LEVEL SHALL NOT DEVIATE MORE THAN 20mm ON A 3m STRAIGHT EDGE. IN CUT THE TRIMMED EXCAVATION MUST BE TO LINE AND LEVEL. FILL MUST BE COMPACTED TO 95% MOD AASHTO DENSITY BEFORE BEING TRIMMED TO LINE AND LEVEL. THE SURFACE SHOULD BE LIKE A GRADE TYPE FINISH FREE FROM PROTRUDING ROOTS, TREE STUMPS, ROCKS, ETC.
 - GEOTEXTILE**
 1. A GEOTEXTILE SIMILAR TO INDUSTEX S135 SHALL BE PLACED ON THE PREPARED SURFACE TO THE LINES SHOWN ON THE DRAWINGS. OVERLAPS MUST AT LEAST BE 200mm.
 - LAYING OF INTERLOCKING BLOCKS**
 1. AFTER THE GEOTEXTILE HAS BEEN APPROVED AND Laid, THE ARMOFLEX BLOCKS SHALL BE Laid BY A HALF BOND INTERLOCKING PATTERN. THE CABLE DUCTS WILL BE AT RIGHT ANGLES TO THE DIRECTION OF WATER FLOW OF THE CANAL, AND THE SHORTER DIMENSION OF THE BLOCKS SHALL BE IN THE DIRECTION OF FLOW. THE MINIMUM ANCHOR BEAM SHALL BE CUT ALONG CORNERS AND BENDS. LAYING SHALL ALWAYS COMMENCE ON THE FLOOR OF THE CANAL. ONCE A GRID OF BLOCKS HAS BEEN Laid, THE WIRES SHALL BE FED THROUGH THE CABLE DUCTS. THE WIRES SHALL BE OF 1.1mm DIAMETER HOT DIPPED GALVANIZED FENCING WIRE. THE LENGTH OF THE WIRES SHALL BE SUFFICIENT TO ALLOW THE EXPOSED ENDS TO BE EFFECTIVELY JOINED. THE WIRES MUST BE JOINED BY TWISTING THE ENDS TOGETHER FOR A TWISTED STRETCH OF MINIMUM 100mm. THE FINISHED LEVEL OF THE ARMOFLEX BLOCKS MAY NOT DEVIATE MORE THAN 20mm ON A 3m STRAIGHT EDGE. NO INDIVIDUAL BLOCK MAY PROTRUDE MORE THAN 10mm FROM ANY ADJACENT BLOCKS.
 - ANCHORING**
 1. ANCHORING BY MEANS OF Y-FENCING STANDARDS
 1. THE BLOCKS WILL BE ANCHORED IN A 2m GRID WITH 1.4m LONG Y-FENCING STANDARDS DRIVEN INTO THE GROUND IF SO INDICATED ON THE DETAIL DRAWINGS OR SPECIFIED BY THE ENGINEER.
 2. ANCHORING WITH ANCHOR BEAM
 1. SPECIFIED BY THE ENGINEER ALONG A STRAIGHT SECTION OF THE CANAL. THE CONCRETE SHALL 400mm DEEP AND THE BEAM SHALL BE AT LEAST 400mm DEEP AND 200mm WIDE. THE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF AT LEAST 20MPa. R8 U-BARS AT 340 CENTRES SHALL BE CAST INTO THE BEAM.
 3. ANCHORING ALONG THE SIDES OF THE CANAL
 1. ANCHORING ALONG THE TOP EDGE OF THE ARMOFLEX LINING SHALL BE ACCORDING TO DETAIL 1 OR 2, AS SPECIFIED.
 2. DETAIL 1: THE UPPER TWO ROWS OF EDGE BLOCKS SHALL BE PLACED HORIZONTALLY AND COVERED BY TOPSOIL AS SHOWN ON THE DRAWINGS. THE LAST LINE OF BLOCKS SHALL BE ANCHORED BY MEANS OF Y-FENCING STANDARDS DRIVEN INTO THE GROUND EVERY 2m ALONG THE EDGE OF THE CANAL.
 3. DETAIL 2: A 200 DEEP x 150 WIDE CLASS 20/19 INSITU CONCRETE BEAM, STANDING AT 2m CENTRES, ANCHORED WITH 1.8m LONG Y-FENCING SHALL, R10 BAR TACKED THROUGH THE WIRE, SHALL BE CAST INTO THE BEAM.
 - BACKFILLING AND GRASSING**
 1. AS SOON AS THE BLOCKS HAVE BEEN Laid, WIRED UP AND THE ANCHORS PROVIDED TO THE SATISFACTION OF THE ENGINEER, THE OPEN CELLS AND JOINT AREAS SHALL BE FILLED WITH TOPSOIL AND THE AREA HYDROSEEDED ACCORDING TO THE SPECIFICATION. FERTILIZER AS APPROVED BY THE ENGINEER SHALL BE MIXED INTO THE SOIL BEFORE BACKFILLING. IMMEDIATELY AFTER HYDROSEEDING THE HYDROSEEDED AREA SHALL BE WATERED.
 - MAINTENANCE**
 1. THE GRASS SHALL BE MAINTAINED DURING THE DURATION OF THE CONTRACT BY WATERING DAMAGED AREAS SHALL BE REPAIRED.

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.

DESIGNED J.P. GROBLER Pr.Eng.	DRAWN S. AUDIE
CHECKED BY P. A. ODENDAAL Pr.Eng.	INFRASTRUCTURE TECHNICAL INFORMATION MANAGEMENT D.J. CHALMERS

PROJECT STATUS			
CONCEPT DRAWING	TENDER DRAWING	APPROVED FOR CONSTRUCTION	AS BUILT DRAWING
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PROJECT ENGINEER (CONSULTANT)	INITIALS AND SURNAME	SIGNATURE AND P. No.	DATE
INSPECTOR OF WORKS (CITY OF TSHWANE)	INITIALS AND SURNAME	SIGNATURE AND P. No.	DATE

CITY OF TSHWANE
ROADS AND TRANSPORT DEPARTMENT
 Mr P. L. Lefomkane
 STRATEGIC EXECUTIVE DIRECTOR
 P.O. BOX 1409
 PRETORIA 0001

Ms. L. V. Kegaklwe-Phiri
 EXECUTIVE DIRECTOR
 P.O. BOX 1409
 PRETORIA 0001

DRAWING APPROVED BY EXECUTIVE DIRECTOR
 Ms. L. V. Kegaklwe-Phiri

TYPICAL STANDARD DETAILS

EROSION PROTECTION MEASURES
ARMOFLEX LINING DETAILS

ROADS AND STORMWATER For Internal Approval	RECEIVED SIGN WHEN APPLICABLE
DIRECTOR: INFRASTRUCTURE PROVISION	SIGNATURE _____ DATE _____
DIRECTOR: INFRASTRUCTURE CONSTRUCTION (PROJECT) MANAGEMENT	SIGNATURE _____ DATE _____
DIRECTOR: INFRASTRUCTURE ASSET MANAGEMENT	SIGNATURE _____ DATE _____
DIRECTOR: TRANSPORT INFRASTRUCTURE PLANNING	SIGNATURE _____ DATE _____
DIRECTOR: INTELLIGENT TRANSPORT SYSTEM AND TRAFFIC ENGINEERING	SIGNATURE _____ DATE _____
DIRECTOR: INFRASTRUCTURE MAINTENANCE MANAGEMENT (IMM)	SIGNATURE _____ DATE _____

CONTRACT No.:	PROJECT No.:
DATE: MAY 2013	SCALE: AS SHOWN
DRAWING NO. STD012	SHEET NO. 1 OF 1
ORIGINAL PAPER SIZE: A1	REVISION