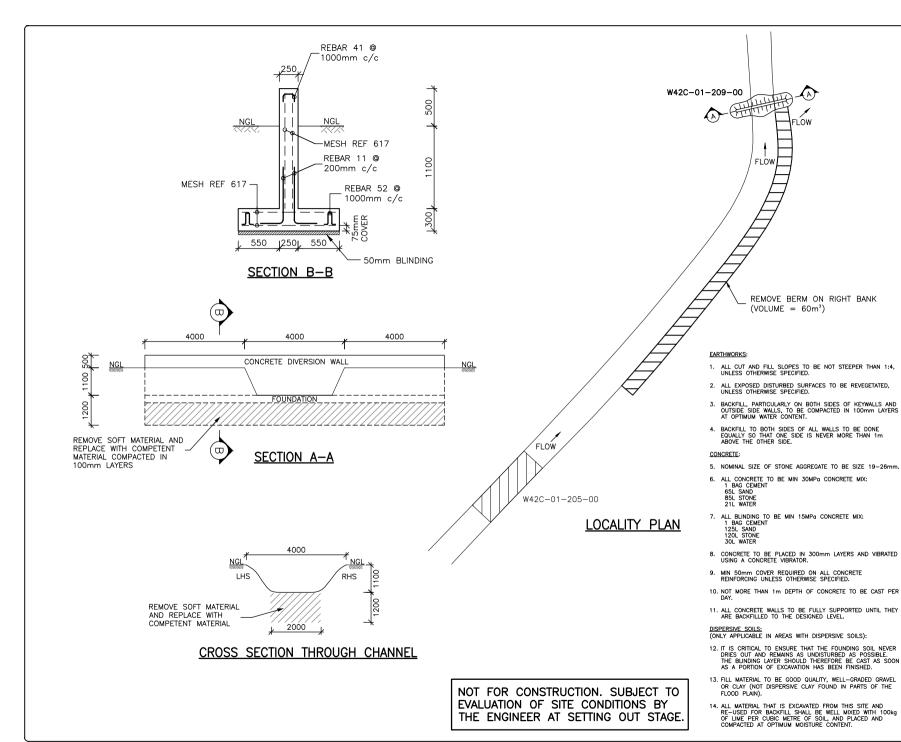
Rehabilitation Plan February 2013

APPENDIX C - DESIGN DRAWINGS



NOTES

FLÓW

REMOVE BERM ON RIGHT BANK

(VOLUME = 60m³)

FLOW

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE
 AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MA
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY





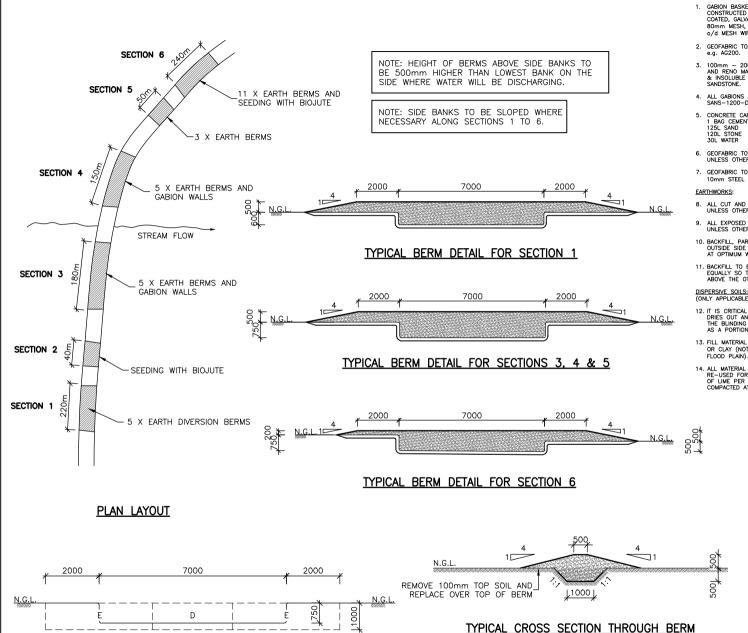
WORKING FOR WETLANDS **MPUMALANGA** WAKKERSTROOM

DRAWING DESCRIPTION

CONCRETE DIVERSION BERM

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. REV No. |W42C-01-209-00/01



TYPICAL SECTION THROUGH GABION WALL IN SECTION 3 & 4

GARIONS:

- GABION BASKETS AND RENO MATTRESSES TO BE CONSTRUCTED OF DOUBLE TWISTED, HEXAGONAL, PVC COATED, GALVANISED WIRE MESH OF NOMINAL DIAMETER 80mm MESH, WITH 3.4mm o/d FRAME WIRE AND 2.7mm o/d MESH WIRE WITH PARTITIONS AT 1m CENTRES.
- 2. GEOFABRIC TO BE NON-WOVEN, NOT LESS THAN 195g/m2
- 100mm 200mm STONE TO BE USED IN ALL GABIONS AND RENO MATTRESSES. STONE FILL MUST BE NON-FRIABLE & INSOLUBLE e.g. GRANITE, BASALT, LIMESTONE OR
- 4. ALL GABIONS AND RENO MATTRESSES TO COMPLY WITH SANS-1200-DK
- 5. CONCRETE CAPPING TO BE MINIMUM 15MPa & MIX: 1 BAG CEMENT 125L SAND 120L STONE
- 6. GEOFABRIC TO BE INSERTED AT ALL SOIL/MESH INTERFACES UNLESS OTHERWISE SPECIFIED.
- 7. GEOFABRIC TO HAVE WEEPHOLES PUNCHED THROUGH USING 10mm STEEL ROD AT APPROXIMATELY 4 HOLES/m2
- 8. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- 9. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 11. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

- (ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):
- 12. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE.
 THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 13. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE
- 14. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

GABION & RENO MATTRESS SIZES

CODE	SIZE
Α	1.0 x 1.0 x 1.0m
В	1.5 x 1.0 x 1.0m
С	2.0 x 1.0 x 1.0m
D	3.0 x 1.0 x 1.0m
Ε	4.0 x 1.0 x 1.0m
F	2.0 x 0.5 x 0.5m
G	2.0 x 1.0 x 0.5m
н	3.0 x 1.0 x 0.5m
J	4.0 x 1.0 x 0.5m
к	2.0 x 1.0 x 0.3m
L	3.0 x 1.0 x 0.3m
М	6.0 x 2.0 x 0.17m
N	6.0 x 2.0 x 0.23m
Р	6.0 x 2.0 x 0.3m

- NOTES AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS NO GEOTECHNICAL TOPOGRAPHICAL GEOMORPHOLOGIC AND OTHER ENGINEERING
 RELATED SURVEYS HAVE BEEN UNDERTAKEN INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE
 AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MA
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING
 INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY





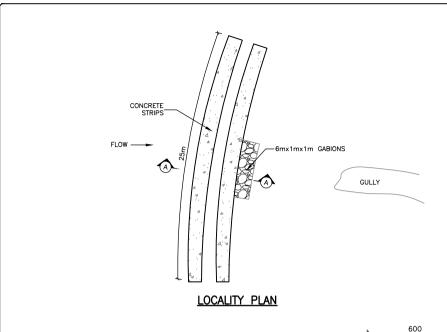
WORKING FOR WETLANDS **MPUMALANGA** WAKKERSTROOM

DRAWING DESCRIPTION

NEW ROAD AND SURFACE CROSS DRAINS

l	DATE	JULY 2012
l	DRAWN BY	B.MCCAROGHER
l	DRAWING CHECKED	D.TOWNSHEND
l	DESIGNED BY	T.PIKE
۱	DESIGN CHECKED	
ı	SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-02-208-00/01



CONCRETE

- 1. NOMINAL SIZE OF STONE AGGREGATE TO BE SIZE 19-26mm.
- 2. ALL CONCRETE TO BE MIN 30MPa CONCRETE MIX: 1 BAG CEMENT 65L SAND

85L STONE 21L WATER

- 3. ALL BLINDING TO BE MIN 15MPa CONCRETE MIX: 1 BAG CEMENT 125L SAND 120L STONE 301 WATER
- 4. CONCRETE TO BE PLACED IN 300mm LAYERS AND VIBRATED USING A CONCRETE VIBRATOR.
- 5. MIN 50mm COVER REQUIRED ON ALL CONCRETE REINFORCING UNLESS OTHERWISE SPECIFIED.
- 6. NOT MORE THAN 1m DEPTH OF CONCRETE TO BE CAST PER
- 7. ALL CONCRETE WALLS TO BE FULLY SUPPORTED UNTIL THEY ARE BACKFILLED TO THE DESIGNED LEVEL.

DISPERSIVE SOILS

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 8. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 9 FILL MATERIAL TO BE GOOD QUALITY WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- 10 ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg
 OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

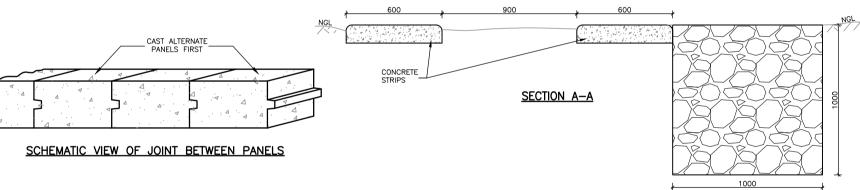
GABIONS:

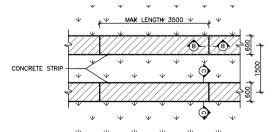
- GABION BASKETS AND RENO MATTRESSES TO BE CONSTRUCTED OF DOUBLE TWISTED, HEXAGONAL, PVC COATED, GALVANISED WIRE MESH OF NOMINAL DIAMETER 80mm MESH, WITH 3.4mm o/d FRAME WIRE AND 2.7mm o/d MESH WIRE WITH PARTITIONS AT 1m CENTRES.
- 2. GEOFABRIC TO BE NON-WOVEN, NOT LESS THAN 195g/m2 e.g. AG200.
- 3. 100mm 200mm STONE TO BE USED IN ALL GABIONS AND RENO MATTRESSES. STONE FILL MUST BE NON-FRIABLE & INSOLUBLE e.g. GRANITE, BASALT, LIMESTONE OR
- ALL GABIONS AND RENO MATTRESSES TO COMPLY WITH SANS-1200-DK.
- 5. CONCRETE CAPPING TO BE MINIMUM 15MPa & MIX: 1 BAG CEMENT 125L SAND 120L STONE 301 WATER
- 6. GEOFABRIC TO BE INSERTED AT ALL SOIL/MESH INTERFACES UNLESS OTHERWISE SPECIFIED.
- 7 GEOFARRIC TO HAVE WEEPHOLES PLINCHED THROUGH LISING 10mm STEEL ROD AT APPROXIMATELY 4 HOLES/m².

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 11. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

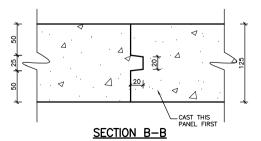
NOTES

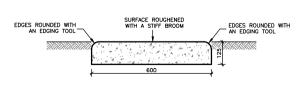
- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS NO GEOTECHNICAL TOPOGRAPHICAL GEOMORPHOLOGIC AND OTHER ENGINEERING
 RELATED SURVEYS HAVE BEEN UNDERTAKEN INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MA
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING
 INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY





PLAN OF CONCRETE STRIP





SECTION C-C

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY THE ENGINEER AT SETTING OUT STAGE.



aurecon

WORKING FOR WETLANDS **MPUMALANGA** WAKKERSTROOM

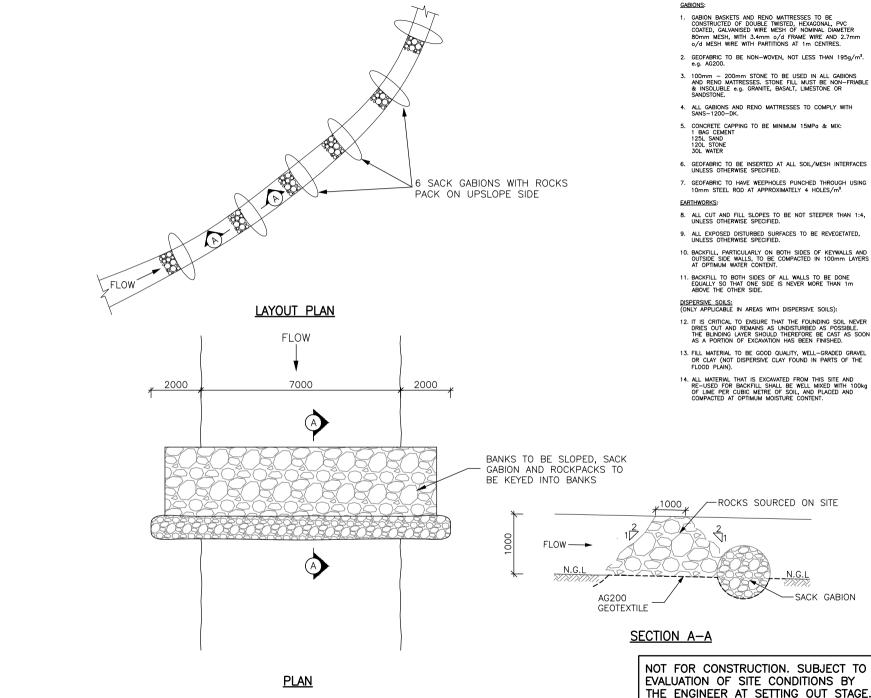
DRAWING DESCRIPTION

CONCRETE STRIPS AND GABION PROTECTION

	DATE	JULY 2012
	DRAWN BY	A.MOHAMED
	DRAWING CHECKED	D.TOWNSHEND
ı	DESIGNED BY	T.PIKE
1	DESIGN CHECKED	
	SCALE	NOT TO SCALE

DRAWING No.

REV No. W42C-02-209-00/01



- DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE.
 THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

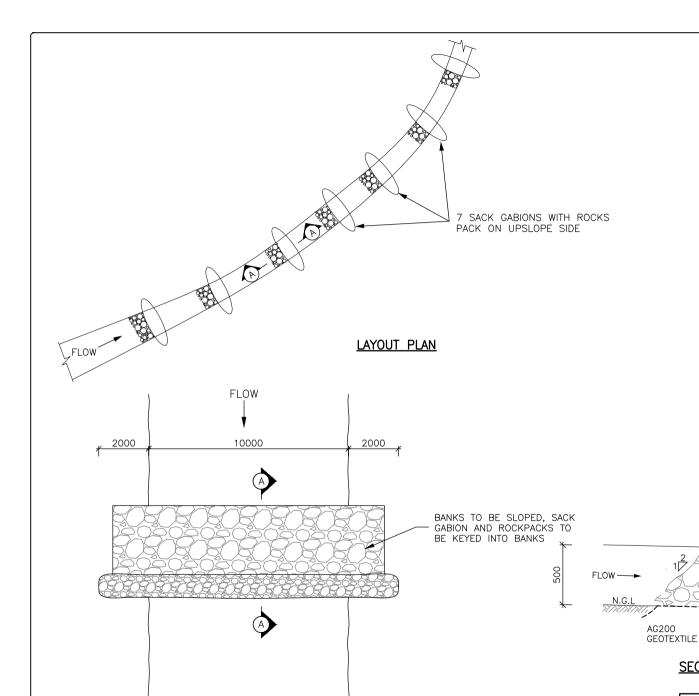
WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

ROCKPACKS

DATE	JULY 2012
DRAWN BY	B.MCCAROGHER
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-02-211-00/01



PLAN

GABIONS:

- GABION BASKETS AND RENO MATTRESSES TO BE CONSTRUCTED OF DOUBLE TWISTED, HEXAGONAL, PVC COATED, GALVANISED WIRE MESH OF NOMINAL DIAMETER 80mm MESH, WITH 3.4mm o/d FRAME WIRE AND 2.7mm o/d MESH WIRE WITH PARTITIONS AT 1m CENTRES.
- 2. GEOFABRIC TO BE NON-WOVEN, NOT LESS THAN 195g/m2
- 100mm 200mm STONE TO BE USED IN ALL GABIONS AND RENO MATTRESSES. STONE FILL MUST BE NON-FRIABLE & INSOLUBLE e.g. GRANITE, BASALT, LIMESTONE OR
- 4. ALL GABIONS AND RENO MATTRESSES TO COMPLY WITH
- 5. CONCRETE CAPPING TO BE MINIMUM 15MPa & MIX: 1 BAG CEMENT 125L SAND 120L STONE
- 6. GEOFABRIC TO BE INSERTED AT ALL SOIL/MESH INTERFACES UNLESS OTHERWISE SPECIFIED.
- 7. GEOFABRIC TO HAVE WEEPHOLES PUNCHED THROUGH USING 10mm STEEL ROD AT APPROXIMATELY 4 HOLES/m2

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- 10. BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS: (ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 12. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED
- 13. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- 14. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

ROCKS SOURCED ON SITE

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

ROCKPACKS

DATE	JULY 2012
DRAWN BY	B.MCCAROGHER
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-02-212-00/01

SECTION A-A

1000

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY THE ENGINEER AT SETTING OUT STAGE.

SACK GABION

- 1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 4. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

NOTE:

A TOTAL OF 16 SURFACE CROSS DRAINS TO BE CONSTRUCTED AT 20m INTERVALS ON STEEP SECTIONS TO DIVERT WATER OFF THE ROAD.

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY

THE ENGINEER AT SETTING OUT STAGE.

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 6. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- 7. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJECT

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

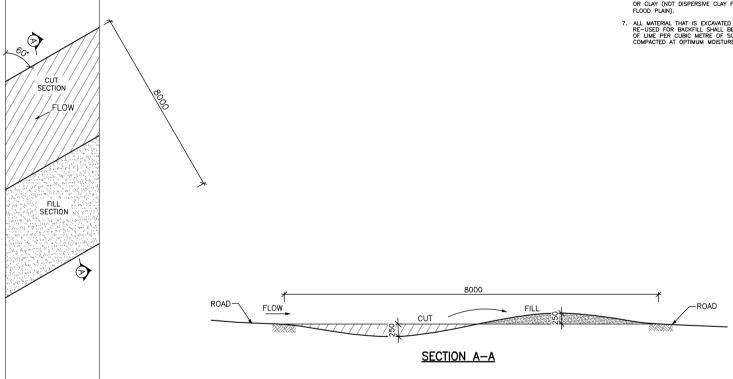
DRAWING DESCRIPTION

SURFACE CROSS DRAIN

- 1		
ı	DATE	JULY 2012
	DRAWN BY	A.MOHAMED
	DRAWING CHECKED	D.TOWNSHEND
ı	DESIGNED BY	T.PIKE
H	DESIGN CHECKED	
Н	SCALE	NOT TO SCALE

DRAWING No.

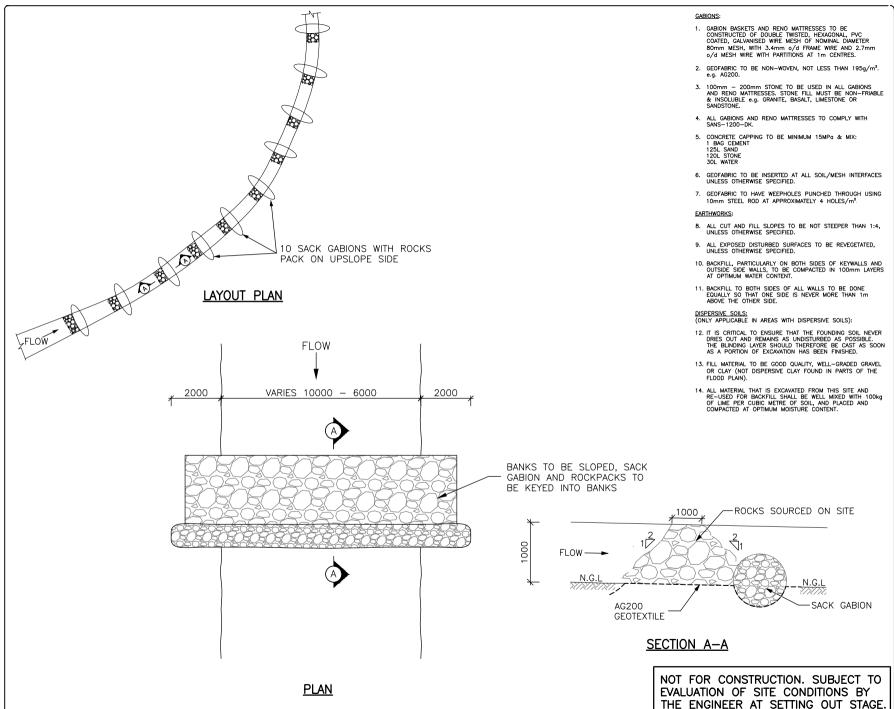
REV No. W42C-02-213-00/01 Α



ROAD SLOPING

DOWNHILL

PLAN



NOTES

- 1. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AWALABLE INFORMATION. THE AWALABLE INFORMATION IS LUMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, ECHOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON—STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDENNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED BISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- 2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILICENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJEC

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

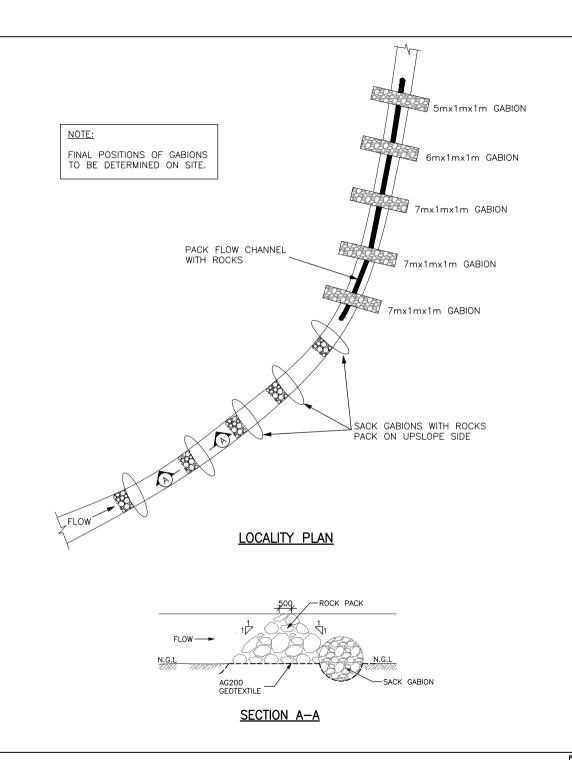
ROCKPACKS

DATE	JULY 2012
DRAWN BY	B.MCCAROGHER
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No.

W42C-02-215-00/01 A

REV No.



GARIONS:

- GABION BASKETS AND RENO MATTRESSES TO BE CONSTRUCTED OF DOUBLE TWISTED, HEXAGONAL, PVC COATED, GALVANISED WIRE MESH OF NOMINAL DIAMETER 80mm MESH, WITH 3.4mm o/d FRAME WIRE AND 2.7mm o/d MESH WIRE WITH PARTITIONS AT 1m CENTRES.
- 2. GEOFABRIC TO BE NON-WOVEN, NOT LESS THAN 195g/m2.
- 100mm 200mm STONE TO BE USED IN ALL GABIONS AND RENO MATTRESSES. STONE FILL MUST BE NON-FRIABLE & INSOLUBLE e.g. GRANITE, BASALT, LIMESTONE OR
- 4. ALL GABIONS AND RENO MATTRESSES TO COMPLY WITH SANS-1200-DK
- 5. CONCRETE CAPPING TO BE MINIMUM 15MPa & MIX: 1 BAG CEMENT 125L SAND 120L STONE
- 6. GEOFABRIC TO BE INSERTED AT ALL SOIL/MESH INTERFACES UNLESS OTHERWISE SPECIFIED.
- 7. GEOFABRIC TO HAVE WEEPHOLES PUNCHED THROUGH USING 10mm STEEL ROD AT APPROXIMATELY 4 HOLES/m2

EARTHWORKS:

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- 9. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 12. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE.
 THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON
 AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 13. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- 14. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN 1 INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

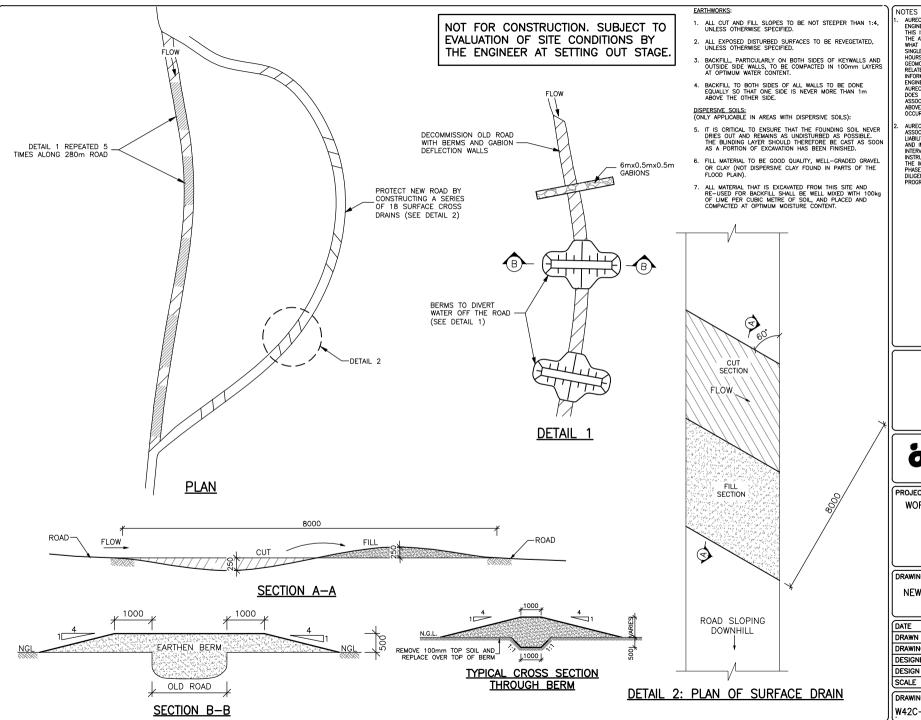
DRAWING DESCRIPTION

GULLY STABILIZATION

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

Α

DRAWING No. REV No. W42C-02-216-00/01



AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY

AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY





WORKING FOR WETLANDS **MPUMALANGA** WAKKERSTROOM

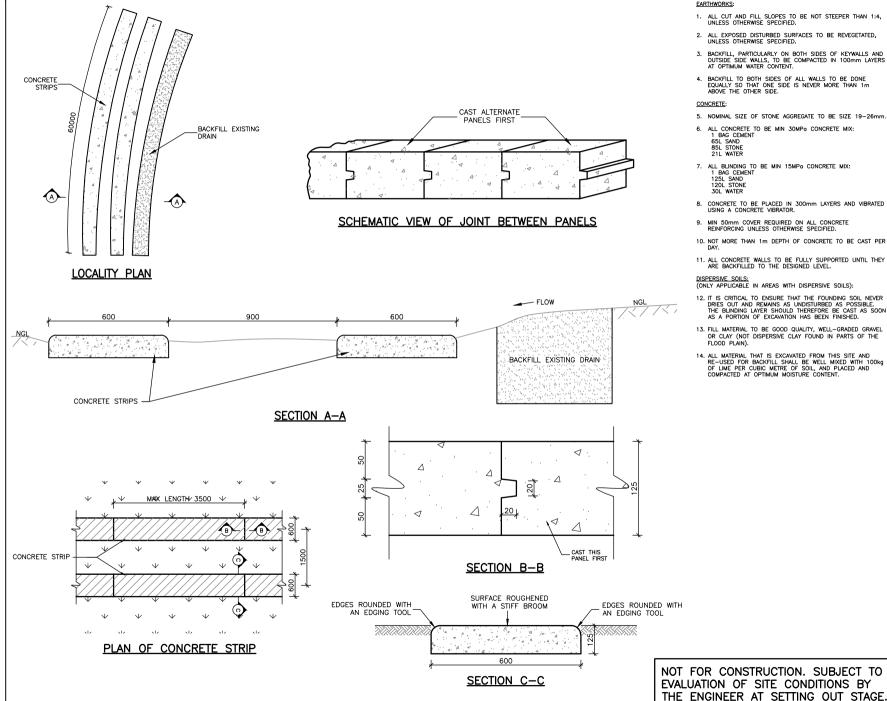
DRAWING DESCRIPTION

NEW ROAD AND SURFACE CROSS DRAINS

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No.

REV No. |W42C-02-217-00/01



- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

- 5. NOMINAL SIZE OF STONE AGGREGATE TO BE SIZE 19-26mm.
- 6. ALL CONCRETE TO BE MIN 30MPa CONCRETE MIX: 1 BAG CEMENT 65L SAND 85L STONE

- ALL BLINDING TO BE MIN 15MPa CONCRETE MIX:
 1 BAG CEMENT
 125L SAND 120L STONE 30L WATER
- 8. CONCRETE TO BE PLACED IN 300mm LAYERS AND VIBRATED USING A CONCRETE VIBRATOR.
- MIN 50mm COVER REQUIRED ON ALL CONCRETE REINFORCING UNLESS OTHERWISE SPECIFIED.
- 10. NOT MORE THAN 1m DEPTH OF CONCRETE TO BE CAST PER
- 11. ALL CONCRETE WALLS TO BE FULLY SUPPORTED UNTIL THEY ARE BACKFILLED TO THE DESIGNED LEVEL.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 12. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE.
 THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON
 AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 13. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE
- 14. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg
 OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND
 COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN T INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MA
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY





WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

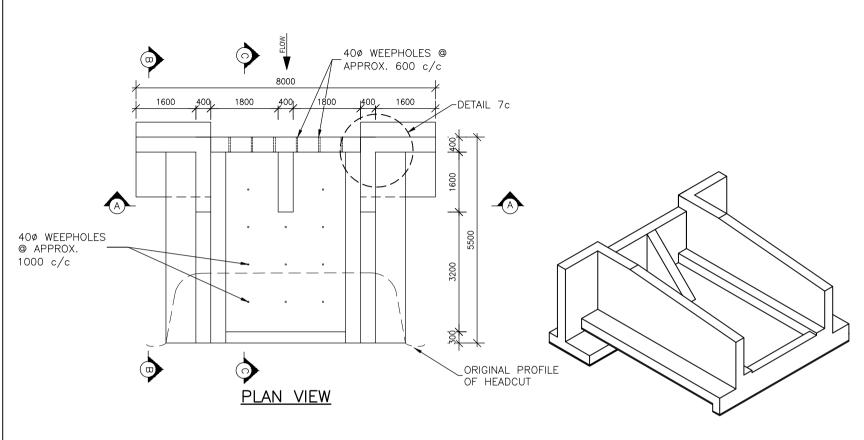
DRAWING DESCRIPTION

CONCRETE STRIPS AND BACKFILL EXISTING DRAIN

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-02-218-00/01 Α

P:\PROJECTS\107406\ENGINEERING\13-INTERVENTIONS\W42C-02\W42C-02-218-00\2012_3_REHAB\DRAWINGS\W42C-02-218-00_01_REVA.DWG



ISOMETRIC VIEW

SECTION A-A

NOTE: STRUCTURE TO BE SET INTO HEADCUT TO CREATE SPACE FOR CONSTRUCTION OF APRON SLAB.

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY THE ENGINEER AT SETTING OUT STAGE.

) NOTES

- 1. AUREON ACCESTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THE TREND THE THAT THAT THE STATE OF THE THAT THE THAT THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE WIST OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTRACH TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AUREON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ASSOCIATED RISK OF FAILURE FROM THE
- 2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS OF AGAINST AND ACCEPTS OF AGAINST AND AND LIMPLEMENTATION OF THE PROBLEMENT OF A CONTROL OF THE AGAINST AND A CONTROL OF



aurecon

| PROJEC

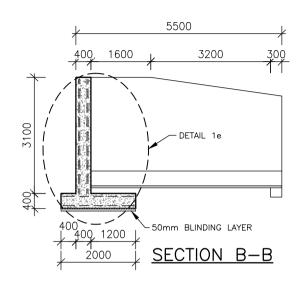
WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

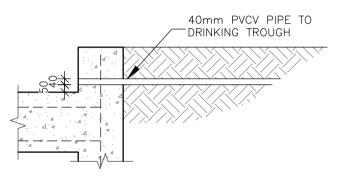
CONCRETE WEIR

١	DATE	JULY 2012
I	DRAWN BY	D.RAJNA
l	DRAWING CHECKED	D.TOWNSHEND
I	DESIGNED BY	T.PIKE
l	DESIGN CHECKED	
١	SCALE	NOT TO SCALE

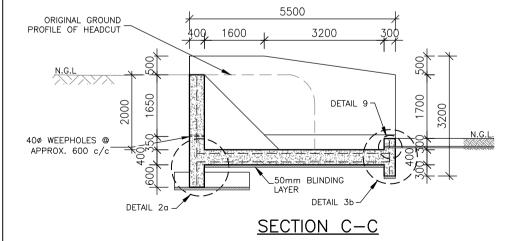
DRAWING No. | REV No. | W42C-02-219-00/01 | A



DETAIL No.	SHEET No.	DESCRIPTION
-	SHEET 02	TYPICAL WEEPHOLE DETAIL
-	SHEET 02	TYPICAL CONSTRUCTION JOINT DETAIL
-	SHEET 02	STANDARD NOTES FOR CONCRETE WEIRS
-	SHEET 03	REBAR DETAIL
1e	SHEET 05	KEY WALL DETAILS
2a	SHEET 06	SPILLWAY DETAILS
3b	SHEET 06	CUT-OFF WALL DETAILS
6f	SHEET 09	SHOULDER WALL DETAILS
7c	SHEET 12	SPILLWAY CORNER DETAILS



DETAIL 9



NOTE:

4.0m x 4.0m CONCRETE CAPPED RENO MATTRESS TO BE INSTALLED AROUND THE DRINKING WATER TROUGH.

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY THE ENGINEER AT SETTING OUT STAGE.

NOTES

- I. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXITENT HANT THE PROPERTY OF THE EXPENT HAND THE PROPERTY OF THE PROPERTY
- 2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTION SOULT TO AURECON BEING INSTRUCTION OF AND LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILICENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJECT

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

CONCRETE WEIR

li	DATE	JULY 2012
Ш	DRAWN BY	D.RAJNA
П	DRAWING CHECKED	D.TOWNSHEND
П	DESIGNED BY	T.PIKE
П	DESIGN CHECKED	
Ц	SCALE	NOT TO SCALE

DRAWING No. | REV No. | W42C-02-219-00/02 | A

ROAD SLOPING

DOWNHILL

SECTION ÉLÓW

SECTION

PLAN

ROAD-

FLOW

- 1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 4. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

8000

SECTION A-A

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 6. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJECT

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

SURFACE CROSS DRAIN

1	DATE	JULY 2012
	DRAWN BY	A.MOHAMED
	DRAWING CHECKED	D.TOWNSHEND
	DESIGNED BY	T.PIKE
	DESIGN CHECKED	
	SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-02-220-00/01

NOTE: A TOTAL OF 21 SURFACE CROSS DRAINS TO BE CONSTRUCTED AT 20m INTERVALS ON STEEP SECTIONS TO DIVERT WATER OFF THE ROAD.

-ROAD

ROAD SLOPING

DOWNHILL

SECTION ÉLÓW

SECTION

PLAN

ROAD-

FLOW

- 1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 4. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 6. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN 1 INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJECT

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

SURFACE CROSS DRAIN

ı	DATE	JULY 2012
ı	DRAWN BY	A.MOHAMED
1	DRAWING CHECKED	D.TOWNSHEND
l	DESIGNED BY	T.PIKE
ı	DESIGN CHECKED	
ı	SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-02-221-00/01

-ROAD

NOTE:

8000

SECTION A-A

A TOTAL OF 9 SURFACE CROSS DRAINS TO BE CONSTRUCTED AT 20m INTERVALS ON STEEP SECTIONS TO DIVERT WATER OFF THE ROAD.

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- I. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THE PRINCESSEND TO THE EXTENT THAT THE PANALES INFORMATION IS FORTED TO THE PRINCESSEND TO THE PRINCESSEND THE PRINCESSEND THE PRINCESSEND TO THE PRINCESSEND THE PRINCESSEND THE PRINCESSEND THAT THE PRINCESSEND THE PRINCESSEND THE PRINCESSEND THE PRINCESSEND THE PRINCESSEND THE PRINCESSEND THAT THE PRINCESSEND THE PRINCESSEND THE PRINCESSEND THAT THAT THE PRINCESSEND THE PRINCESSEND THAT THE PRINCESSEND THAT THE PRINCESSEND THAT
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH HE CONSTRUCTION INTERVENTION OF THE CONSTRUCTION INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.



aurecon

PROJECT

WORKING FOR WETLANDS
MPUMALANGA
WAKKERSTROOM

DRAWING DESCRIPTION

SURFACE CROSS DRAIN

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. | REV No. | W42C-02-222-00/01 | A

SECTION A—A

ROAD SLOPING

DOWNHILL

SECTION /

SECTION

PLAN

ROAD-

FLOW

NOTE:

A TOTAL OF 5 SURFACE CROSS DRAINS TO BE CONSTRUCTED AT 20m INTERVALS ON STEEP SECTIONS TO DIVERT WATER OFF THE ROAD.

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- I. AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THE SESSED ON AVAILABLE INFORMATION. THE SESSED ON THE SESSED O
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIBBILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING THE CONTROL WITH THE THE CONTROL WITH THE MEMERATER DURING THE CONSTRUCTION OF A CONTROL WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR MABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.



aurecon

PROJECT

WORKING FOR WETLANDS
MPUMALANGA
WAKKERSTROOM

DRAWING DESCRIPTION

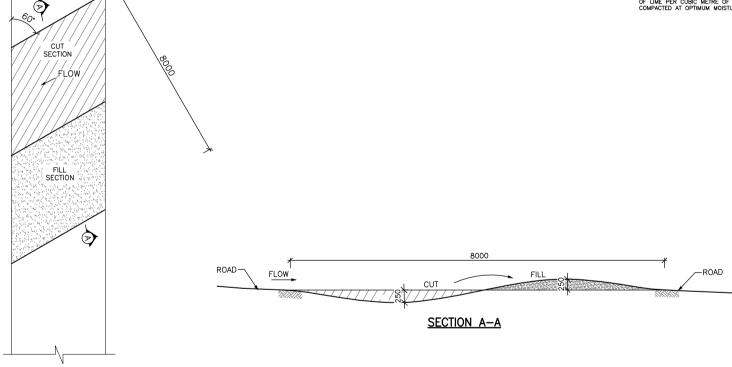
SURFACE CROSS DRAIN

	DATE	JULY 2012
	DRAWN BY	A.MOHAMED
	DRAWING CHECKED	D.TOWNSHEND
	DESIGNED BY	T.PIKE
	DESIGN CHECKED	
Н	SCALE	NOT TO SCALE

DRAWING No. | REV No. | W42C-02-223-00/01 | A

NOTE:
A TOTAL OF 4 SURFACE CROSS
DRAINS TO BE CONSTRUCTED AT
20m INTERVALS ON STEEP SECTIONS
TO DIVERT WATER OFF THE ROAD.

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY THE ENGINEER AT SETTING OUT STAGE.



ROAD SLOPING

DOWNHILL

PLAN

ROAD SLOPING

DOWNHILL

SECTION ÉLÓW

SECTION

PLAN

ROAD-

FLOW

- 1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 4. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 6. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJECT

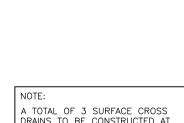
WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

SURFACE CROSS DRAIN

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-02-224-00/01



8000

SECTION A-A

DRAINS TO BE CONSTRUCTED AT 20m INTERVALS ON STEEP SECTIONS TO DIVERT WATER OFF THE ROAD.

-ROAD

- 1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 4. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS: (ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 6. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJECT

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

SURFACE CROSS DRAIN

ı	DATE	JULY 2012
ı	DRAWN BY	A.MOHAMED
ı	DRAWING CHECKED	D.TOWNSHEND
ı	DESIGNED BY	T.PIKE
ı	DESIGN CHECKED	
1	SCALE	NOT TO SCALE

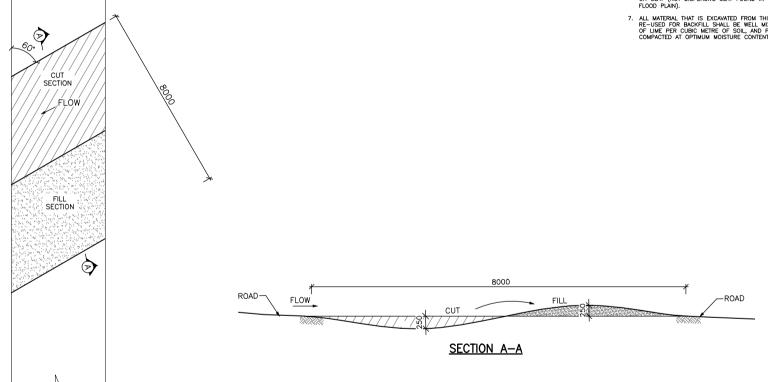
REV No.

DRAWING No. W42C-02-225-00/01

NOTE:

A TOTAL OF 14 SURFACE CROSS DRAINS TO BE CONSTRUCTED AT 20m INTERVALS ON STEEP SECTIONS TO DIVERT WATER OFF THE ROAD.

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY THE ENGINEER AT SETTING OUT STAGE.



ROAD SLOPING

DOWNHILL

PLAN

ROAD SLOPING

DOWNHILL

SECTION ÉLÓW

SECTION

PLAN

ROAD-

FLOW

- 1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 4. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 6. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJECT

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

SURFACE CROSS DRAIN

ı	DATE	JULY 2012
ı	DRAWN BY	A.MOHAMED
1	DRAWING CHECKED	D.TOWNSHEND
l	DESIGNED BY	T.PIKE
ı	DESIGN CHECKED	
ı	SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-02-226-00/01

NOTE:

8000

SECTION A-A

A TOTAL OF 32 SURFACE CROSS DRAINS TO BE CONSTRUCTED AT 20m INTERVALS ON STEEP SECTIONS TO DIVERT WATER OFF THE ROAD.

-ROAD

NOTE:

A TOTAL OF 24 SURFACE CROSS DRAINS TO BE CONSTRUCTED AT 20m INTERVALS ON STEEP SECTIONS TO DIVERT WATER OFF THE ROAD.

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY

THE ENGINEER AT SETTING OUT STAGE.

- 1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 4. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 6. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

PROJECT

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

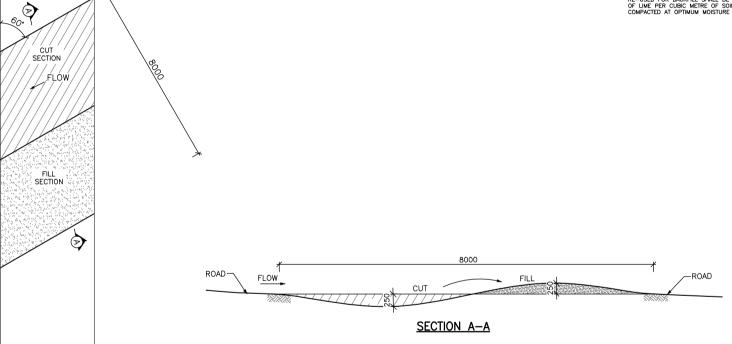
DRAWING DESCRIPTION

SURFACE CROSS DRAIN

	DATE	JULY 2012
	DRAWN BY	A.MOHAMED
	DRAWING CHECKED	D.TOWNSHEND
	DESIGNED BY	T.PIKE
	DESIGN CHECKED	
Н	SCALE	NOT TO SCALE

DRAWING No.

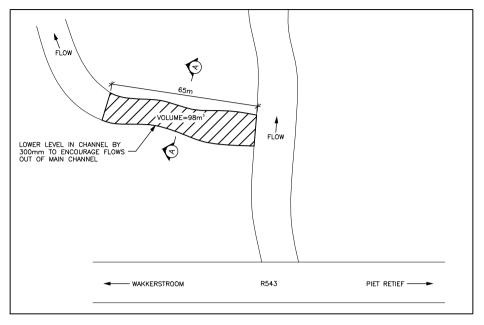
REV No. W42C-02-227-00/01 Α



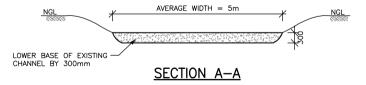
ROAD SLOPING

DOWNHILL

PLAN



LOCALITY PLAN



EARTHWORKS:

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- IN AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THAT THAT SESSED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION OF THE AVAILABLE INFORMATION OF THE AVAILABLE INFORMATION OF THE THAT A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMOGRAPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDETFACEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILABLE FROM THE ASSOCIATED RISK OF FAILABLE FROM THE ASSOCIATED RISK OF FAILABLE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- 2. AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LISBILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING STREET, AND ASSOCIATED WITH THE CONTROL WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILICENTLY SUPERVISE AND ASSESS ANY PROGRESS.



aurecon

PROJECT

WORKING FOR WETLANDS
MPUMALANGA
WAKKERSTROOM

DRAWING DESCRIPTION

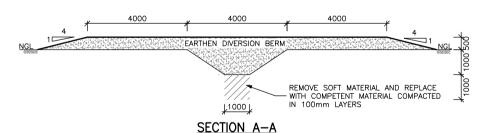
EXCAVATION OF EXISTING CHANNEL

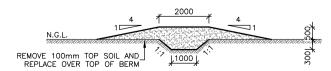
DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. | REV No. | V31A-01-201-00/01 | A

FLOW W42C-01-204-00 FLOW FLOW W42C-01-203-00 FLOW **®**

LOCALITY PLAN





SECTION B-B

EARTHWORKS:

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- 2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- IN AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPETED DURING A FEW OLURS, TO COULD BE THE PROPERTION OF THE PROPERTIES OF THE DESIGN THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDENNIFIED BY THE CUENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ASSOCIATE
 - AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIBBILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AIRPECON BEING INTERVENTIONS DUE TO AIRPECON BEING INTERVENTIONS DUE TO AIRPECON BEING THE AIRPECON BEING THE AIRPECONTRUCTION FLASS RESULTING IN OUR MABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS ANY



aurecon

PROJECT

WORKING FOR WETLANDS
MPUMALANGA
WAKKERSTROOM

DRAWING DESCRIPTION

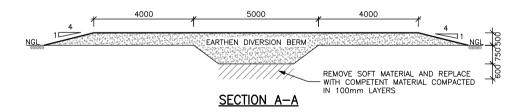
EARTHEN DIVERSION BERM

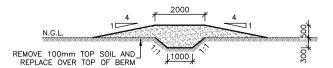
DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. | REV No. | W42C-01-203-00/01 | A

FLOW W42C-01-204-00 FLOW **(a)** REMOVE EARTHEN BERM ALONG UPSTREAM RIGHT HAND BANK (30m³ OF EXCAVATION) FLOW W42C-01-203-00 FLOW FLOW

LOCALITY PLAN





SECTION B-B

EARTHWORKS:

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- 2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- NOT AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE SITE OF THE ASSOCIATED RISK OF THE AUBTE OF THE ASSOCIATED RISK OF THE AUBTE OF THE ASOCIATED RISK OF THE AUBTE OF THE ASOCIATED RISK OF THE AUBTE OF THE ASOCIATED RISK OF THE AUBTE OF THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- . AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIBBILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INTERVENTIONS DUE TO AURECON BEING INTERVENTIONS DUE TO AURECON BEING WITH INSTRUCTED TO AND AURITHMENT WITH THE CONTROLLING OF THE CO





PROJECT

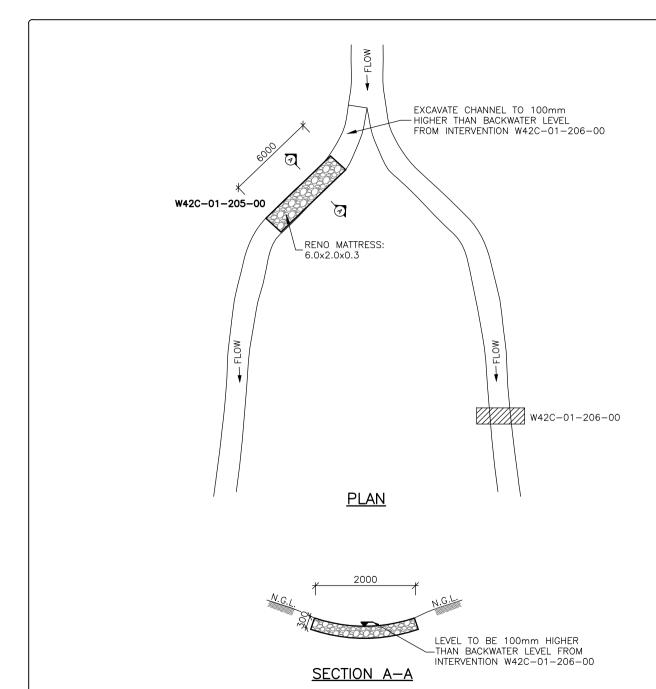
WORKING FOR WETLANDS
MPUMALANGA
WAKKERSTROOM

DRAWING DESCRIPTION

EARTHEN DIVERSION BERM

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. | REV No. | W42C-01-204-00/01 | A



GARIONS:

- GABION BASKETS AND RENO MATTRESSES TO BE CONSTRUCTED OF DOUBLE TWISTED, HEXAGONAL, PVC
 COATED, GALVANISED WIRE MESH OF NOMINAL DIAMETER 80mm MESH, WITH 3.4mm o/d FRAME WIRE AND 2.7mm o/d MESH WIRE WITH PARTITIONS AT 1m CENTRES.
- 2. GEOFABRIC TO BE NON-WOVEN, NOT LESS THAN 195q/m². e.g. AG200.
- 3. 100mm 200mm STONE TO BE USED IN ALL CABIONS AND RENO MATTRESSES. STONE FILL MUST BE NON-FRIABLE & INSOLUBLE e.g. GRANITE, BASALT, LIMESTONE OR SANDSTONE.
- 4. ALL GABIONS AND RENO MATTRESSES TO COMPLY WITH SANS-1200-DK.
- CONCRETE CAPPING TO BE MINIMUM 15MPa & MIX: 1 BAG CEMENT 125L SAND 120L STONE 30L WATER
- 6. GEOFABRIC TO BE INSERTED AT ALL SOIL/MESH INTERFACES UNLESS OTHERWISE SPECIFIED.
- 7. GEOFABRIC TO HAVE WEEPHOLES PUNCHED THROUGH USING 10mm STEEL ROD AT APPROXIMATELY 4 HOLES/m2

- 8. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4. UNI ESS OTHERWISE SPECIFIED.
- 9. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- 10. BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 11. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN $1\,\mathrm{m}$ ABOVE THE OTHER SIDE.

<u>DISPERSIVE SOILS:</u>
(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 12. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN
- 13. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- 14. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN 1 INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



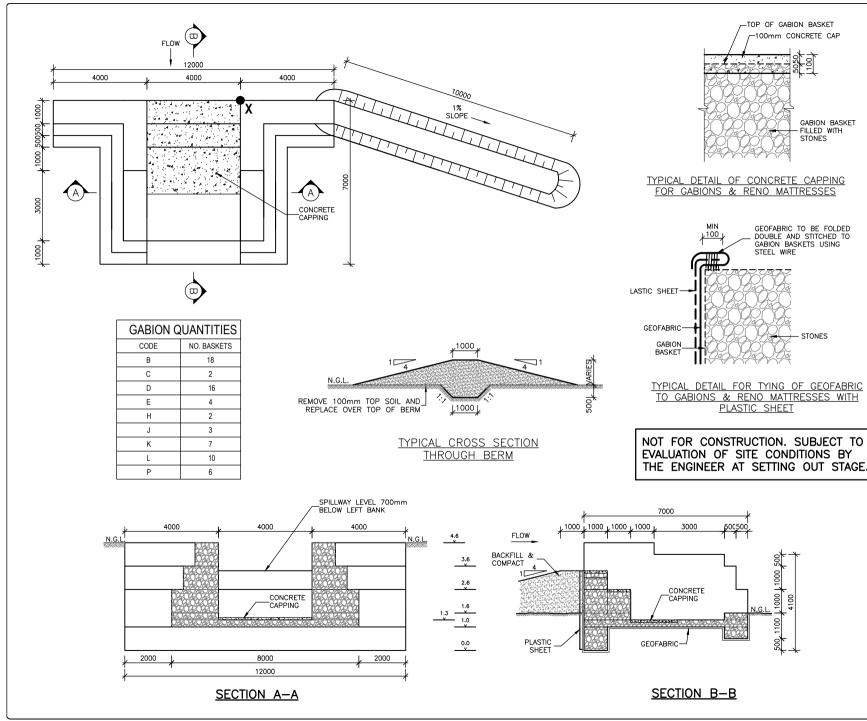


WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION RENO MATTRESS

DATE	JULY 2012
DRAWN BY	B.MCCAROGHER
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-01-205-00/01 Α



NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTERT THAT THIS IS BASED ON AVAILABLE INFORMATION THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS, NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDETRAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURIECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- 2. AURECON IS INDEMNIFED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DILIGENTLY SUPERVISE AND ASSESS ANY PROGRESS.





PROJECT

WORKING FOR WETLANDS
MPUMALANGA
WAKKERSTROOM

DRAWING DESCRIPTION

GABION WEIR: LEVELS & DETAILS

HEND
SCALE

DRAWING No. | REV No. | W42C-01-206-00/01 | A

NOT FOR CONSTRUCTION. SUBJECT TO EVALUATION OF SITE CONDITIONS BY THE ENGINEER AT SETTING OUT STAGE.

12000

4000

K

8000

K

Р Κ Κ լ 2000 լ լ 2000 լ լ 2000 լ 8000 լ 2000 լ 8000 . 2000 L 8000 լ 2000 լ LEVEL 1.6m LEVEL 1.0m LEVEL 1.3m -2xK OVER 1xJ 4000 4000 4000 4000 4000 4000 4000 D D D D D D R С С Ε В D D В В В В В В D n D В В 2000 1 2000 4000 , 2000 _J, 2000 2500 լ 1500 լ , 1500 J 2500 12000 12000 12000 LEVEL 2.6m LEVEL 4.6m LEVEL 3.6m

Р

8000

K

4000

8000

Ε

F

4000

F

GABIONS:

- GABION BASKETS AND RENO MATTRESSES TO BE
 CONSTRUCTED OF DOUBLE TWISTED, HEXAGONAL, PVC
 COATED, GALVANISED WIRE MESH OF NOMINAL DIAMETER
 80mm MESH, WITH 3.4mm o/d FRAME WIRE AND
 2.7mm o/d MESH WIRE WITH PARTITIONS AT 1m
 CENTRES.
- GEOFABRIC TO BE NON-WOVEN, NOT LESS THAN 195q/m². e.q. AG200.
- 3. 100mm 200mm STONE TO BE USED IN ALL GABIONS AND RENO MATTRESSES. STONE FILL MUST BE NON-FRIABLE & INSOLUBLE e.g. GRANITE, BASALT, LIMESTONE OR SANDSTONE.
- 4. ALL GABIONS AND RENO MATTRESSES TO COMPLY WITH SANS-1200-DK
- 5. CONCRETE CAPPING TO BE MINIMUM 15MPa & MIX: 1 BAG CEMENT 125L SAND 120L STONE 30I WATER
- 6. GEOFABRIC TO BE INSERTED AT ALL SOIL/MESH INTERFACES UNLESS OTHERWISE SPECIFIED.
- GEOFABRIC TO HAVE WEEPHOLES PUNCHED THROUGH USING 10mm STEEL ROD AT APPROXIMATELY 4 HOLES/m².

FARTHWORKS:

- 8. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 12. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BUINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 13. FILL MATERIAL TO BE GOOD QUALITY, WELL—GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- 14. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METER OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

0005

GABION & RENO MATTRESS SIZES

CODE			SIZE		
Α	1.0	x	1.0	x	1.0m
В	1.5	x	1.0	x	1.0m
С	2.0	x	1.0	x	1.0m
D	3.0	x	1.0	x	1.0m
Е	4.0	x	1.0	x	1.0m
F	2.0	x	0.5	x	0.5m
G	2.0	x	1.0	x	0.5m
н	3.0	×	1.0	x	0.5m
J	4.0	x	1.0	x	0.5m
к	2.0	x	1.0	x	0.3m
L	3.0	x	1.0	×	0.3m
м	6.0	x	2.0	x	0.17
N	6.0	×	2.0	x	0.23
Р	6.0	x	2.0	x	0.3m

NOTES

- 1. AURECON ACCEDTS RESPONSIBILITY FOR THE EDIGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE, INFORMATION, THE AVAILABLE INFORMATION IS LUMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE SITE WIST OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOCRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDETAKEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDENNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY OCCUR.
- AUREON IS INDEMIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LABOLITY ASSOCIATED WITH THE CONSTRUCTION AND MACHAGINATOR OF THE CONSTRUCTION AND MACHAGINATOR OF THE CONTROL OF THE C





PROJEC

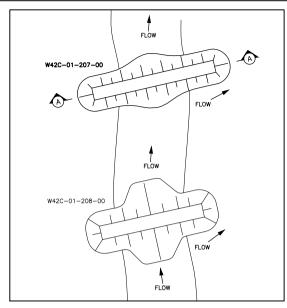
WORKING FOR WETLANDS
MPUMALANGA
WAKKERSTROOM

DRAWING DESCRIPTION

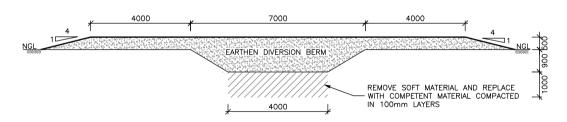
GABION WEIR: LEVELS & DETAILS

DATE	JULY 2012
DRAWN BY	D.RAJNA
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

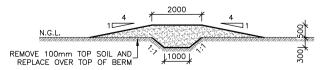
DRAWING No. | REV No. | W42C-01-206-00/02 | A



LOCALITY PLAN



SECTION A-A



SECTION B-B

GABIONS:

- GABION BASKETS AND RENO MATTRESSES TO BE CONSTRUCTED OF DOUBLE TWISTED, HEXAGONAL, PVC COATED, GALVANISED WIRE MESH OF NOMINAL DIAMETER 80mm MESH, WITH 3.4mm o/d FRAME WIRE AND 2.7mm o/d MESH WIRE WITH PARTITIONS AT 1 m CENTRES
- GEOFABRIC TO BE NON-WOVEN, NOT LESS THAN 195g/m². e.g. AG200.
- 3. 100mm 200mm STONE TO BE USED IN ALL GABIONS AND RENO MATTRESSES. STONE FILL MUST BE NON-FRIABLE & INSOLUBLE e.g. GRANITE, BASALT, LIMESTONE OR SANDSTONE
- ALL GABIONS AND RENO MATTRESSES TO COMPLY WITH SANS-1200-DK.
- 5. CONCRETE CAPPING TO BE MINIMUM 15MPa & MIX: 1 BAG CEMENT 125L SAND 120L STONE
- GEOFABRIC TO BE INSERTED AT ALL SOIL/MESH INTERFACES UNLESS OTHERWISE SPECIFIED.
- GEOFABRIC TO HAVE WEEPHOLES PUNCHED THROUGH USING 10mm STEEL ROD AT APPROXIMATELY 4 HOLES/m².

EARTHWORKS

- ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4, UNLESS OTHERWISE SPECIFIED.
- ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 11. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 13. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 14. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- 15. ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- 1. AURECON ACCEPTS RESPONSIBILITY FOR THE DEMONETION DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A SINGLE STEP 195T OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER DEMONETAINEN TO INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ASSOCIATED RISK OF FAILURE FROM THE ASOCIATED RISK OF FAILURE FROM THE ASOCIATED RISK OF FAILURE FROM THE ASOCIATED RISK OF FAILURE FROM THE ASOCIATED.
- AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY TO DUIGCITITY SUPERMSE AND ASSESS ANY



aurecon

ROJECT

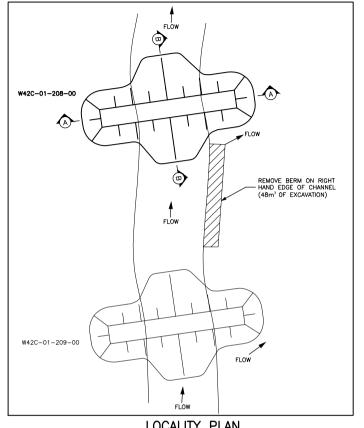
WORKING FOR WETLANDS
MPUMALANGA
WAKKERSTROOM

DRAWING DESCRIPTION

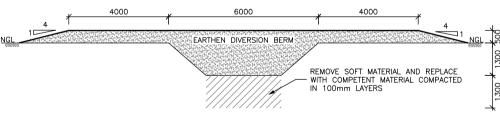
GABION DIVERSION WALL

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

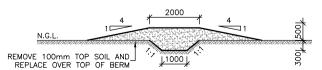
DRAWING No. | REV No. | | RE



LOCALITY PLAN



SECTION A-A



SECTION B-B

EARTHWORKS:

- 1. ALL CUT AND FILL SLOPES TO BE NOT STEEPER THAN 1:4,
- 2. ALL EXPOSED DISTURBED SURFACES TO BE REVEGETATED, UNLESS OTHERWISE SPECIFIED.
- BACKFILL, PARTICULARLY ON BOTH SIDES OF KEYWALLS AND OUTSIDE SIDE WALLS, TO BE COMPACTED IN 100mm LAYERS AT OPTIMUM WATER CONTENT.
- 4. BACKFILL TO BOTH SIDES OF ALL WALLS TO BE DONE EQUALLY SO THAT ONE SIDE IS NEVER MORE THAN 1m ABOVE THE OTHER SIDE.

DISPERSIVE SOILS:

(ONLY APPLICABLE IN AREAS WITH DISPERSIVE SOILS):

- 5. IT IS CRITICAL TO ENSURE THAT THE FOUNDING SOIL NEVER DRIES OUT AND REMAINS AS UNDISTURBED AS POSSIBLE. THE BLINDING LAYER SHOULD THEREFORE BE CAST AS SOON AS A PORTION OF EXCAVATION HAS BEEN FINISHED.
- 6. FILL MATERIAL TO BE GOOD QUALITY, WELL-GRADED GRAVEL OR CLAY (NOT DISPERSIVE CLAY FOUND IN PARTS OF THE FLOOD PLAIN).
- ALL MATERIAL THAT IS EXCAVATED FROM THIS SITE AND RE-USED FOR BACKFILL SHALL BE WELL MIXED WITH 100kg OF LIME PER CUBIC METRE OF SOIL, AND PLACED AND COMPACTED AT OPTIMUM MOISTURE CONTENT.

NOTES

- AURECON ACCEPTS RESPONSIBILITY FOR THE ENGINEERING DESIGN TO THE EXTENT THAT THIS IS BASED ON AVAILABLE INFORMATION. THE AVAILABLE INFORMATION IS LIMITED TO WHAT COULD BE INTERPRETED DURING A
 SINGLE SITE VISIT OF NO LONGER THAN A FEW HOURS. NO GEOTECHNICAL, TOPOGRAPHICAL, GEOMORPHOLOGIC AND OTHER ENGINEERING RELATED SURVEYS HAVE BEEN UNDERTAKEN 1 INFORM THE DESIGN. THIS IS NON-STANDARD ENGINEERING PRACTICE AND THEREFORE AURECON IS INDEMNIFIED BY THE CLIENT AND DOES NOT ACCEPT RESPONSIBILITY FOR THE ASSOCIATED RISK OF FAILURE FROM THE ABOVE LIMITATIONS OR ANY DAMAGES THAT MAY
 - AURECON IS INDEMNIFIED AGAINST ANY ASSOCIATED DAMAGES AND ACCEPTS NO LIABILITY ASSOCIATED WITH THE CONSTRUCTION AND IMPLEMENTATION OF ENGINEERING AND IMPLEMENTATION OF ENGINEERING INTERVENTIONS DUE TO AURECON BEING INSTRUCTED TO HAVE LIMITED CONTACT WITH THE IMPLEMENTER DURING THE CONSTRUCTION PHASE RESULTING IN OUR INABILITY OF DILIGENTLY SUPERVISE AND ASSESS ANY



aurecon

WORKING FOR WETLANDS MPUMALANGA WAKKERSTROOM

DRAWING DESCRIPTION

EARTHEN DIVERSION BERM

DATE	JULY 2012
DRAWN BY	A.MOHAMED
DRAWING CHECKED	D.TOWNSHEND
DESIGNED BY	T.PIKE
DESIGN CHECKED	
SCALE	NOT TO SCALE

DRAWING No. REV No. W42C-01-208-00/01