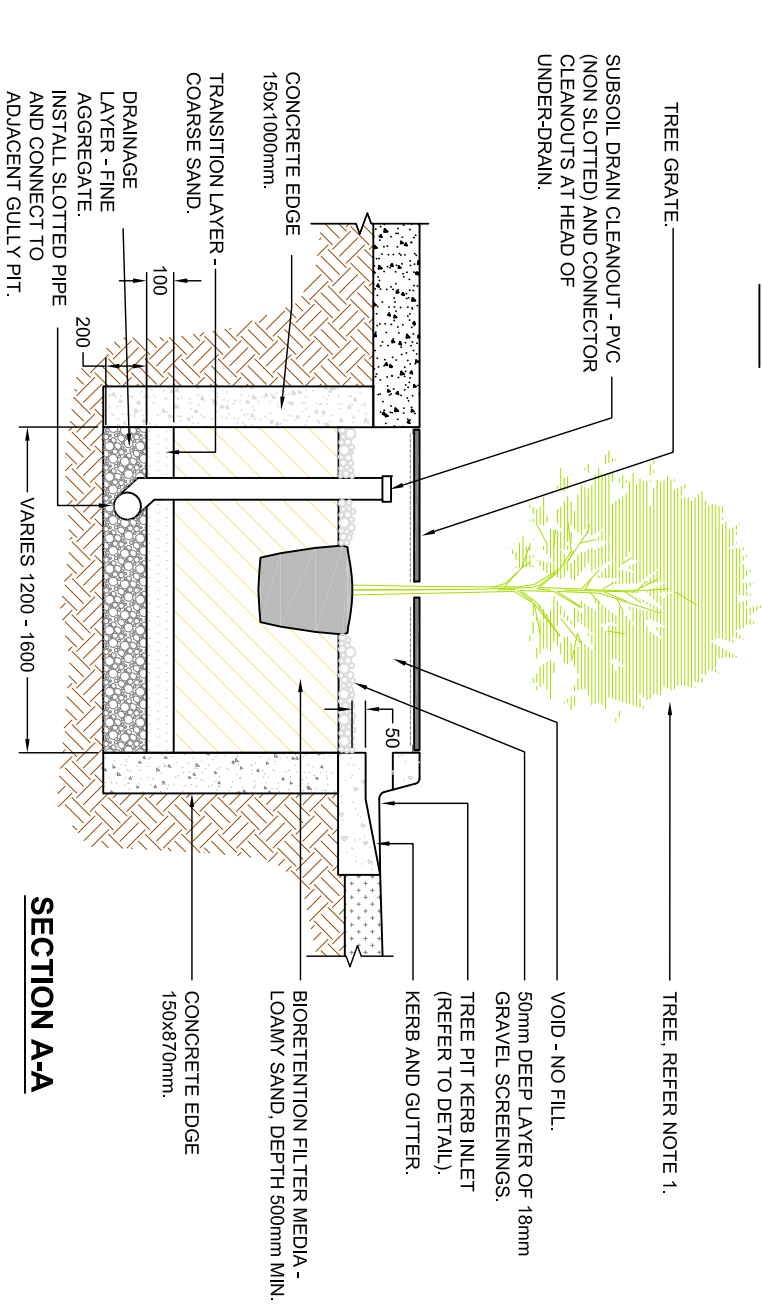
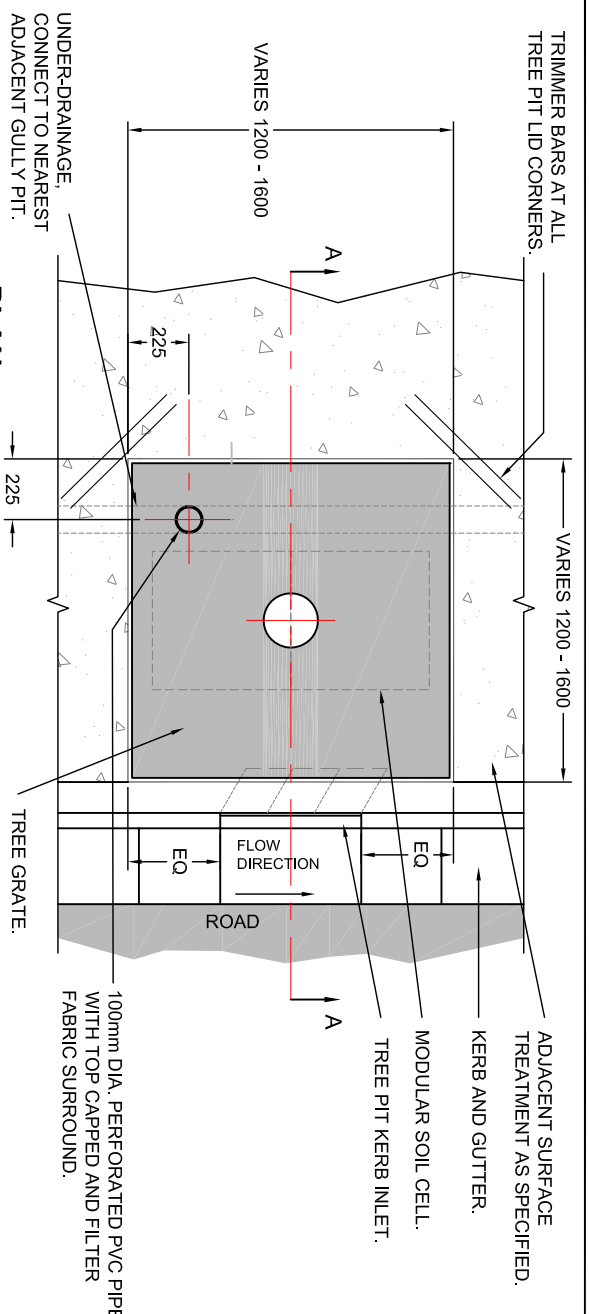
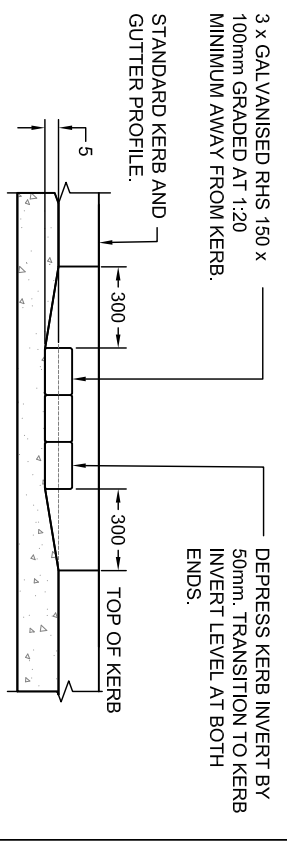
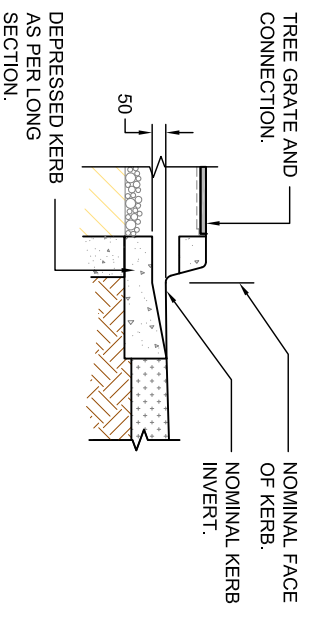


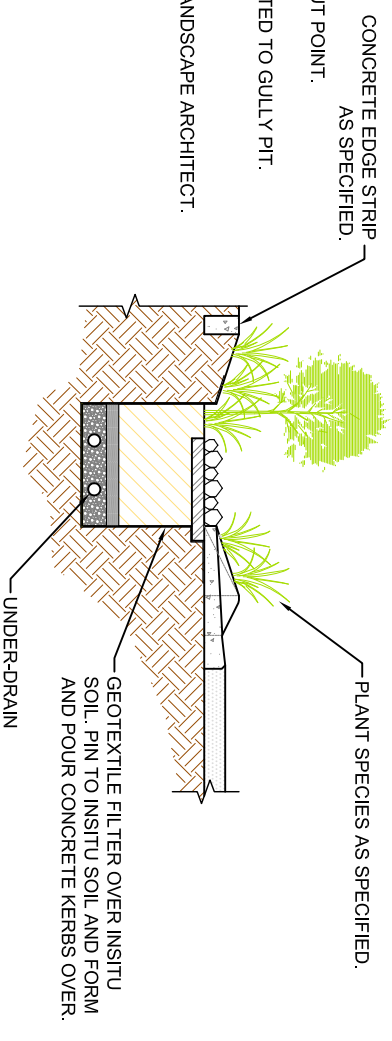


- NOTES**
1. FOR GENERAL DESIGN AND CONSTRUCTION NOTES REFER TO MBRC-2103.
 2. WSD KERB SHOWN IS ONLY SUITABLE FOR STREET TREE PITS AND SMALL RAINGARDENS. LARGER SYSTEMS MAY NEED SPECIFIC INLET DESIGN OR MULTIPLE INLETS.
 3. WHERE NO PARKING LANE EXISTS, RHS KERB INLET MAY BE REPLACED BY AN OPEN KERB CUT.
 4. WHERE TREE PIT LIES IN A LOW POINT (SAG) RHS INLETS MAY BE ALIGNED AT RIGHT ANGLES TO KERB. ENSURE DRAINAGE IS INSTALLED APPROPRIATELY TO MANAGE STORMWATER VOLUMES.
 5. ENSURE TREE PIT DRAINAGE IS CONNECTED TO STORMWATER SYSTEM TO AVOID FLOODING THE TREE.
 6. TREE PITS ARE TO BE LOCATED UPSTREAM OF GULLY PITS.
 7. DRAWING DETAIL BASED ON THE BRISBANE CITY COUNCIL DRAWING UMS-164, JUNE 2010.
 8. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.

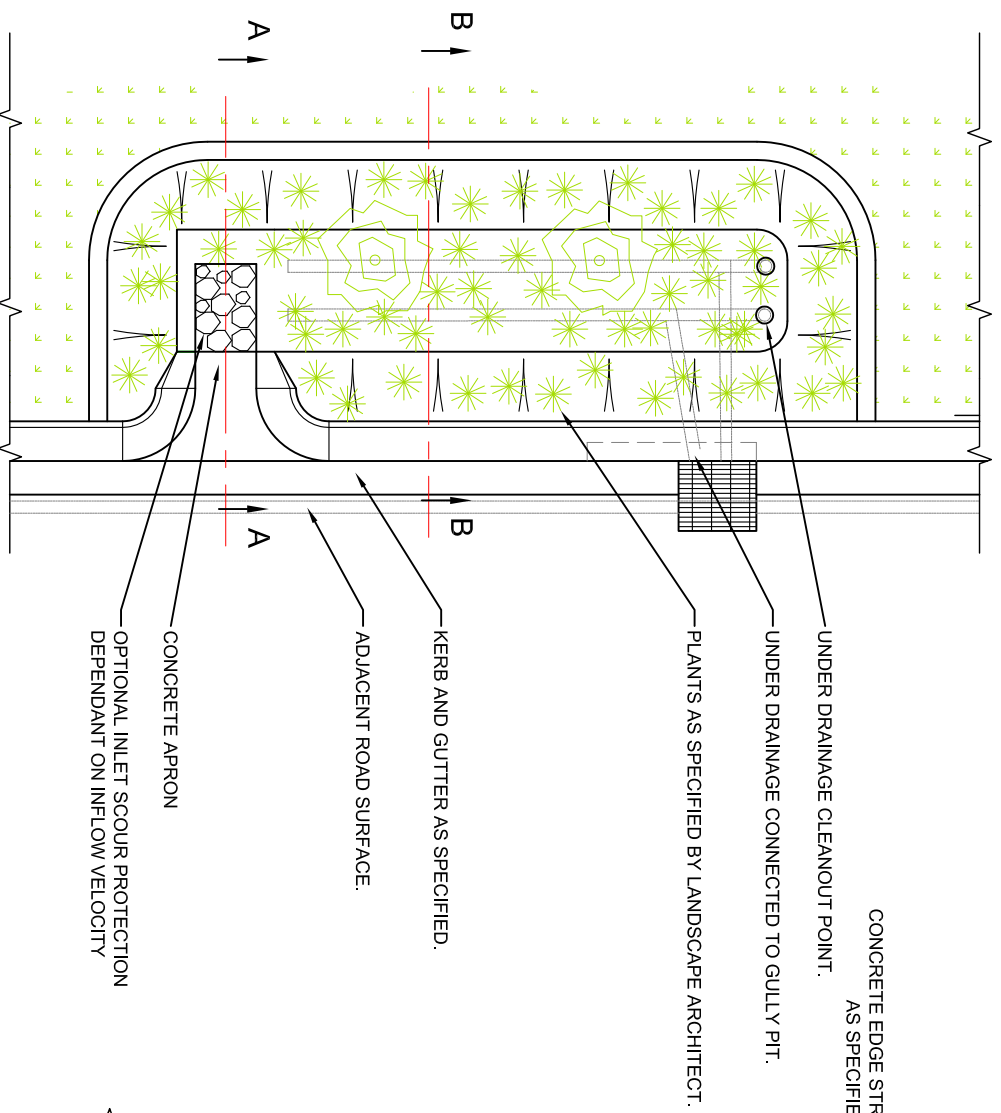
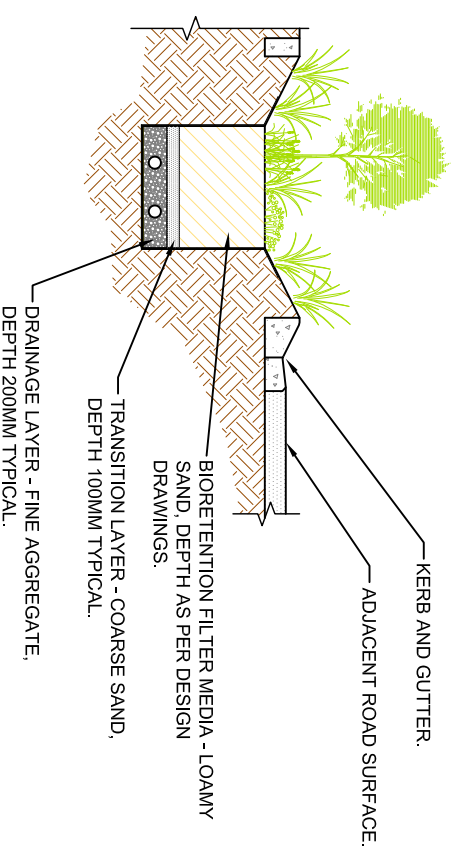


- NOTES**
1. FOR GENERAL DESIGN AND CONSTRUCTION NOTES REFER TO MBRC-2103.
 2. A ROOT BARRIER SHOULD BE INSTALLED ON THE ALLOTMENT SIDE OF THE BIORETENTION SYSTEM WHERE CONDUITS FOR SERVICES (E.G. SEWERAGE, WATER) ARE WITHIN 1000mm OF THE FILTER MEDIA.
 3. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.

NOTES



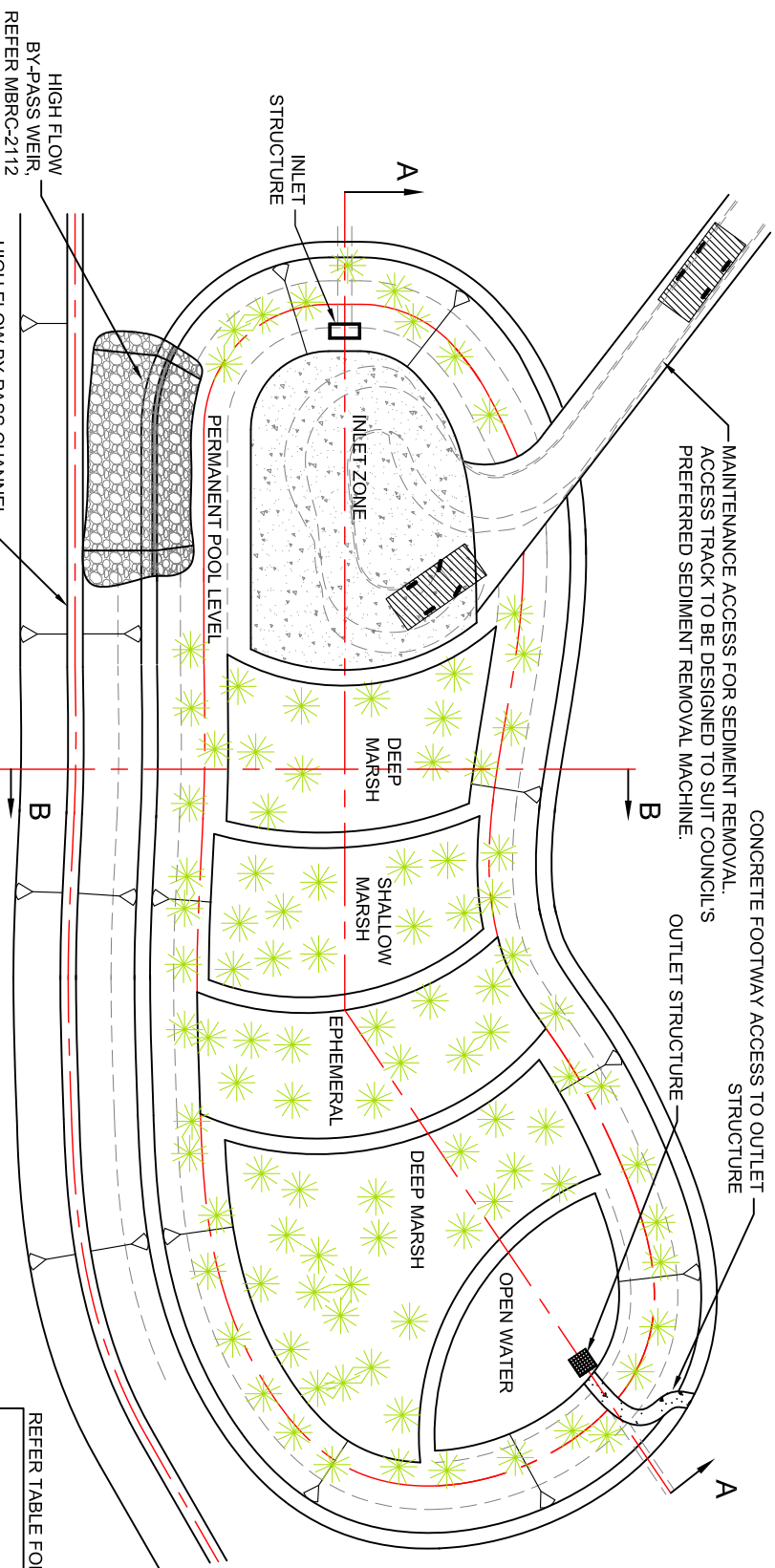
SECTION A-A



PLAN

SECTION B-B

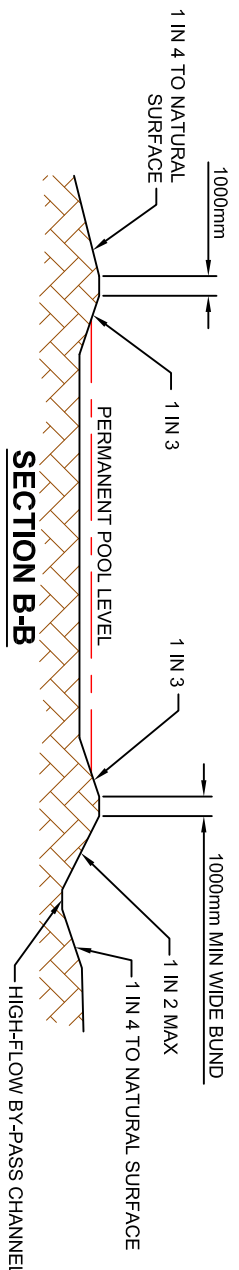
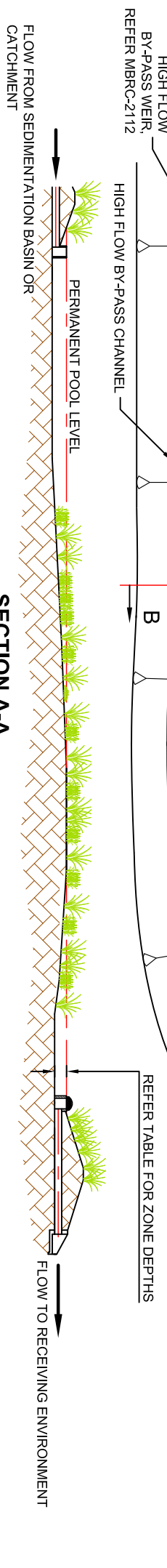
A	26 FEB 13	FIRST ISSUE	
VERSION	DATE	COMMENTS	
			DRAWING TITLE STREETSCAPE BIORETENTION
			DRAWING No: MBRC - 2102
			VERSION: A



- NOTES**
1. FOR GENERAL DESIGN AND CONSTRUCTION NOTES REFER TO MBRC-2103.
 2. ENGINEERING WORKS TO BE DESIGNED IN ACCORDANCE WITH COUNCIL'S ENGINEERING GUIDELINES
 3. WETLAND INLET ZONE SHALL BE CONSTRUCTED WITH A COMPACTED CLAY BASE TO ASSIST WITH MAINTENANCE. THE BASE MUST HAVE A BEARING CAPACITY TO SUPPORT MAINTENANCE MACHINERY WHEN ACCESS IS REQUIRED INTO THE BASIN.
 4. THE PROVISION FOR A MAINTENANCE DRAIN SHALL BE CONFIRMED WITH COUNCIL.
 5. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.

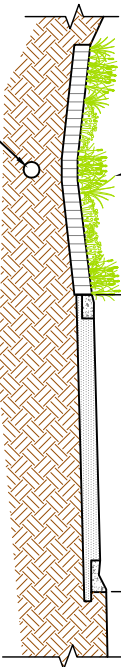
ZONE	DEPTH* (m)
INLET ZONE/OPEN WATER	0.5 to 1.5
DEEP MARSH	0.35 to 0.5
SHALLOW MARSH	0.2 to 0.35
EPHEMERAL	0.0 to +0.2**

* DEPTH REFERS TO DEPTH BELOW PERMANENT POOL LEVEL.
** '+' DENOTES LEVEL ABOVE PERMANENT POOL LEVEL.



PLANTED SWALE. FOR LANDSCAPE
PLANTING, CHANNEL DIMENSIONS AND
SLOPE, REFER TO NOTE 1.

VARIES
SETDOWN TO SWALE. REFER
TO MBRC-003.

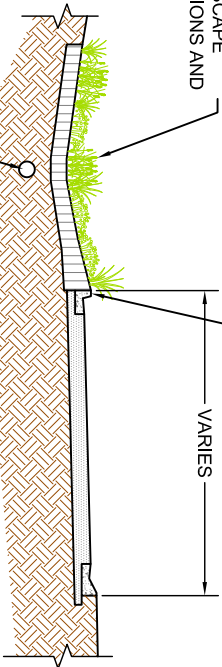


SLOTTED CONVEYANCE PIPE
(OPTIONAL) CONNECTED TO
STORMWATER DRAINAGE.

TYPE 1 SWALE

PROVIDE KERB TRANSITIONS AT NO
GREATER THAN 15m CRS. IN KERB TO
ALLOW WATER INTO SWALE. REFER
TO MBRC-2107 FOR KERB TRANSITION
DETAIL.

PLANTED SWALE. FOR LANDSCAPE
PLANTING, CHANNEL DIMENSIONS AND
SLOPE, REFER TO NOTE 1.



SLOTTED CONVEYANCE PIPE
(OPTIONAL) CONNECTED TO
STORMWATER DRAINAGE.

ALTERNATIVE TYPE 1 SWALE

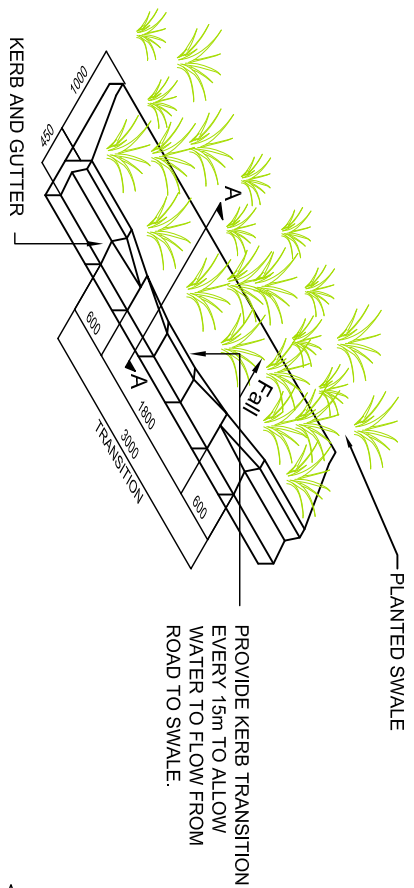
NOTES

1. CHANNEL DIMENSIONS: SWALE BATTER SLOPES SHALL NOT BE STEEPER THAN 1V:4H. SWALE IS TO HAVE A MAXIMUM INVERT DEPTH (DEPTH FROM INVERT TO TOP OF BATTER OR KERB EDGE) OF 400mm. SWALE CAN BE TRAPEZOIDAL (IE. WITH A BASE WIDTH) OR V-SHAPED.
2. SWALE LONGITUDINAL GRADIENT: SWALE GRADIENT MUST NOT EXCEED 5% OR BE BELOW 1% ALONG ANY 10m SECTION OF THE SWALE. FOR SECTIONS WITH GRADIENTS LESS THAN 1%, A BIORETENTION SWALE (REFER TO MBRC-007) IS RECOMMENDED.
3. MAXIMUM FLOW/DEPTH: VELOCITY DEPTH PRODUCT FOR Q2 EVENT MUST BE LESS THAN 0.4m²/s (WHICH WILL TYPICALLY NECESSITATE THE USE OF FIELD INLETS WITHIN THE SWALE AND CONVEYANCE PIPES). MAXIMUM PIPE OF FLOW IN Q2 EVENT MUST BE LESS THAN 300mm. CONSIDERATION MUST BE GIVEN TO MAJOR (EG. Q100) FLOWS AND ROAD CAPACITY.
4. FIELD INLETS: FIELD INLETS TO BE LOCATED WITHIN SWALE CHANNEL UPSTREAM OF ROAD CROSSINGS AND/OR TO CONVEY FLOWS ABOVE SWALE CAPACITY TO PIPED DRAINAGE. MAXIMUM FIELD INLET SPACINGS TO BE DETERMINED BASED ON NOTE 3 REQUIREMENTS, BUT NOT TO EXCEED 60m. LANDSCAPING (EG. DENSE PLANTING OF SHRUBS) SHOULD BE PROVIDED AROUND FIELD INLETS TO REDUCE ACCESS TO FIELD INLETS BY PUBLIC.
5. ADJACENT LAND USAGE: FOR 'TYPE 1' SWALES, LAND USAGE IMMEDIATELY ADJACENT TO SWALE SHALL BE OPEN SPACE (EG. FOREST, PARK).
6. TRAFFIC CONTROLS: DESIGNERS SHALL INCORPORATE FEATURES THAT PREVENT OR DISCOURAGE THE DRIVING OR PARKING OF VEHICLES IN THE SWALE. BOLLARDS MAY BE USED WITHIN THE TREES AND POLES ALIGNMENT IN ACCORDANCE WITH THE FOLLOWING:
 - MINIMUM HEIGHT TO BE 1000mm
 - BOLLARDS TO BE MADE FROM SUSTAINABLE PRODUCTS
 - PREFERABLE MAXIMUM IN CROSS SECTION TO BE 150 X 150
 - NO CONCRETE FOOTINGS.
 - CONSIDER VISIBILITY WHEN SPECIFYING COLOUR
 - NOT RECOMMENDED FOR GREATER THAN 50km/hr ENVIRONMENTS.
 - REFLECTORS SHOULD BE FITTED.
 - KERBS: KERBS TO BE CONSTRUCTED IN ACCORDANCE WITH MBRC STANDARD DETAILS.
8. FOR CONCRETE EDGE DETAILS, REFER TO MBRC STANDARD DRAWINGS.
9. FOR ROAD WIDTHS, REFER TO MBRC STANDARD DRAWINGS.
10. DRAWING DETAIL BASED ON THE BRISBANE CITY COUNCIL DRAWING UMS 159-1, JUNE 2010.
11. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.

A	25 FEB 13	FIRST ISSUE			
VERSION	DATE	COMMENTS			
					
					
DRAWING TITLE			DRAWING No:		
STREETSCAPE SWALE - TYPICAL SECTION			MBRC - 2106		
SHEET 1			VERSION:		
			A		

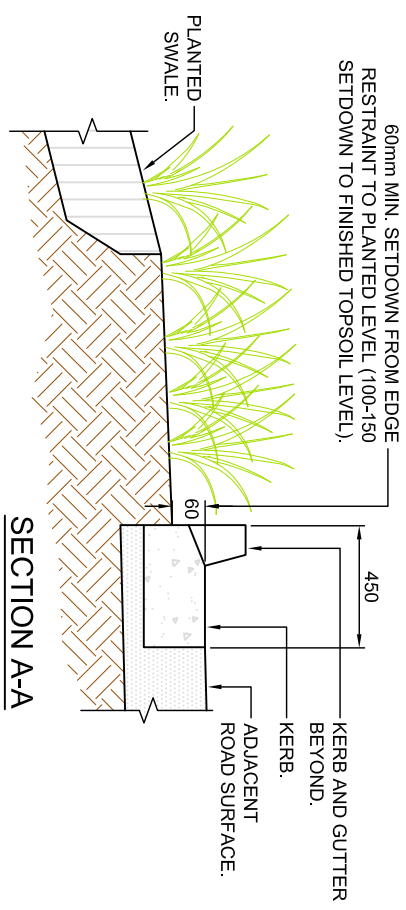
NOTES

- 1. FOR GENERAL NOTES REFER TO MBRC-2106 AND MBRC-2103
- 2. ENGINEERING WORKS TO BE DESIGNED IN ACCORDANCE WITH COUNCIL'S ENGINEERING GUIDELINES.
- 3. DRAWING DETAIL BASED ON THE BRISBANE CITY COUNCIL DRAWING UMS 159-2, JUNE 2010.
- 4. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.

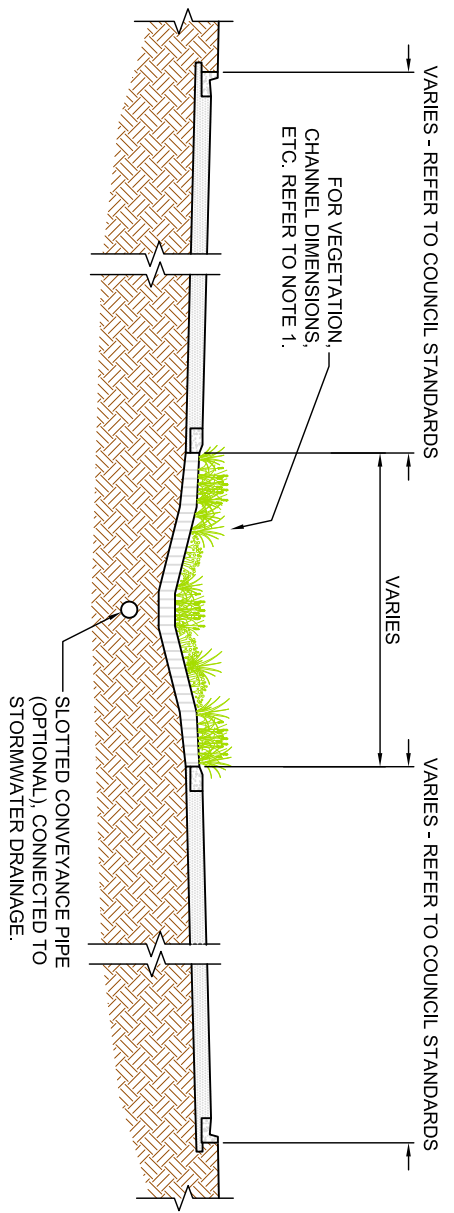


KERB TRANSITION DETAIL

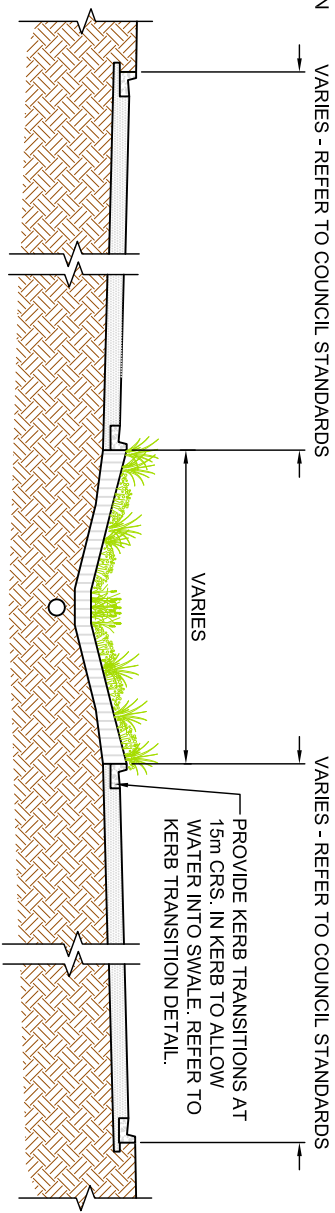
ALTERNATIVE TYPE 1 AND TYPE 2 SWALE



SECTION A-A



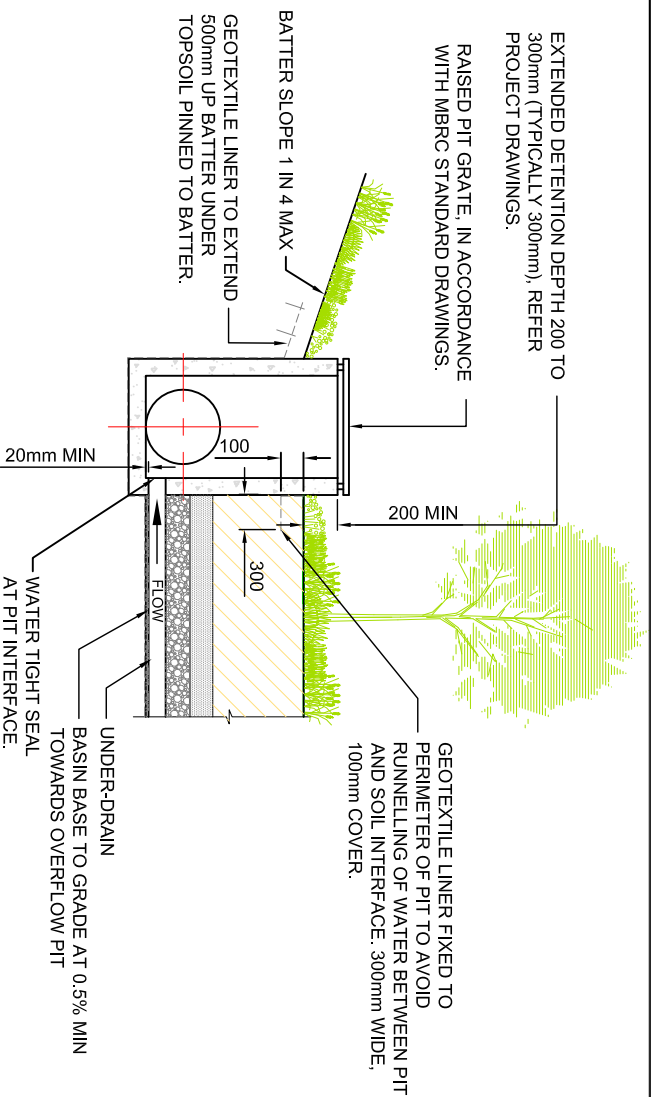
TYPE 2 SWALE



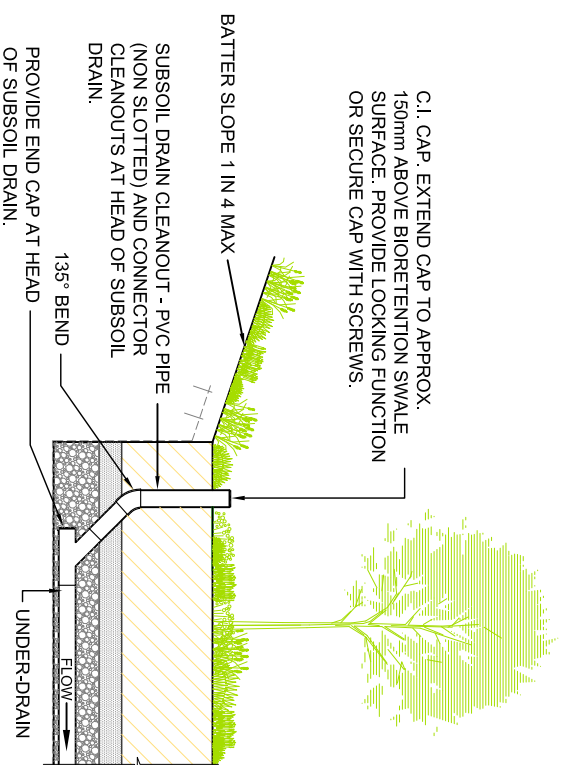
ALTERNATIVE TYPE 2 SWALE

NOTES

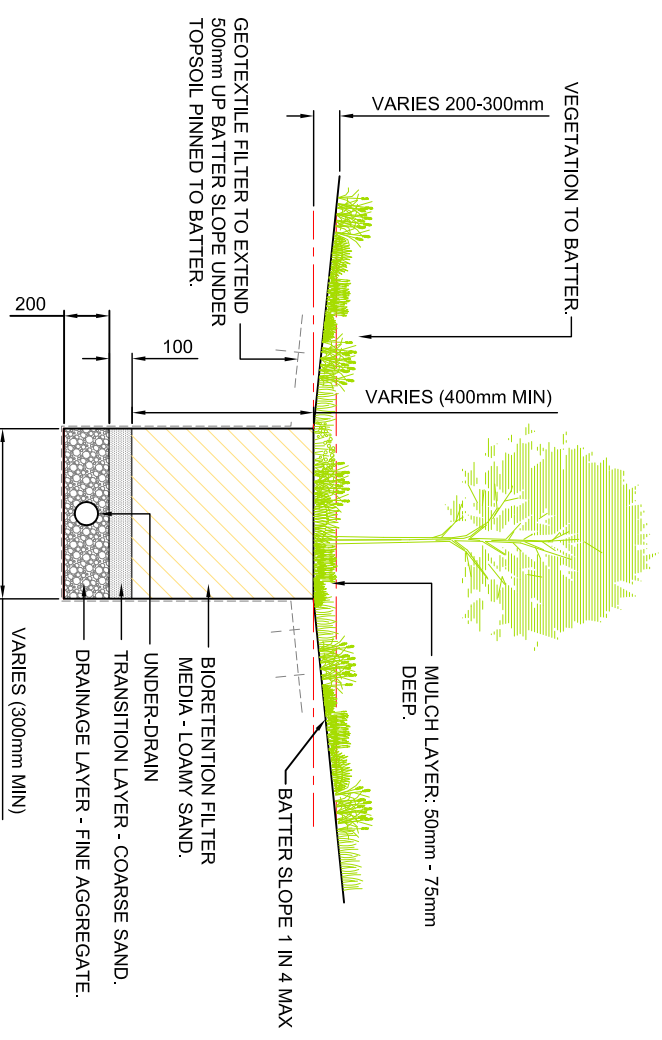
1. FOR GENERAL DESIGN AND CONSTRUCTION NOTES REFER TO MBRC-2103.
2. TRAFFIC CONTROLS: FOR STREETSCAPE SYSTEMS, DESIGNERS SHALL INCORPORATE FEATURES THAT PREVENT OR DISCOURAGE THE DRIVING OR PARKING OF VEHICLES IN THE BIORETENTION SYSTEM. BOLLARDS MAY BE USED WITHIN THE TREES AND POLES ALIGNMENT IN ACCORDANCE WITH THE FOLLOWING:
 - MINIMUM HEIGHT TO BE 1000mm
 - CONSIDER VISIBILITY WHEN SPECIFYING COLOUR
 - BOLLARDS TO BE MADE FROM SUSTAINABLE PRODUCTS
 - NOT RECOMMENDED FOR GREATER THAN 50km/hr ENVIRONMENTS
 - PREFERABLE MAXIMUM IN CROSS SECTION TO BE 150x150
 - NO CONCRETE FOOTINGS.
3. SERVICES: LOCATION OF SERVICES TO BE VERIFIED PRIOR TO EXCAVATION. BIORETENTION SYSTEMS MUST HAVE A MINIMUM HORIZONTAL SETBACK OF 300mm FROM ANY WATER SUPPLY AND SEWERAGE INFRASTRUCTURE.
4. DRAWING DETAIL BASED ON THE BRISBANE CITY COUNCIL DRAWING UMS-160, JUNE 2010.
5. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.



BIORETENTION OVERFLOW PIT - TYPICAL SECTION



BIORETENTION UNDER-DRAIN CLEANOUT - TYPICAL SECTION

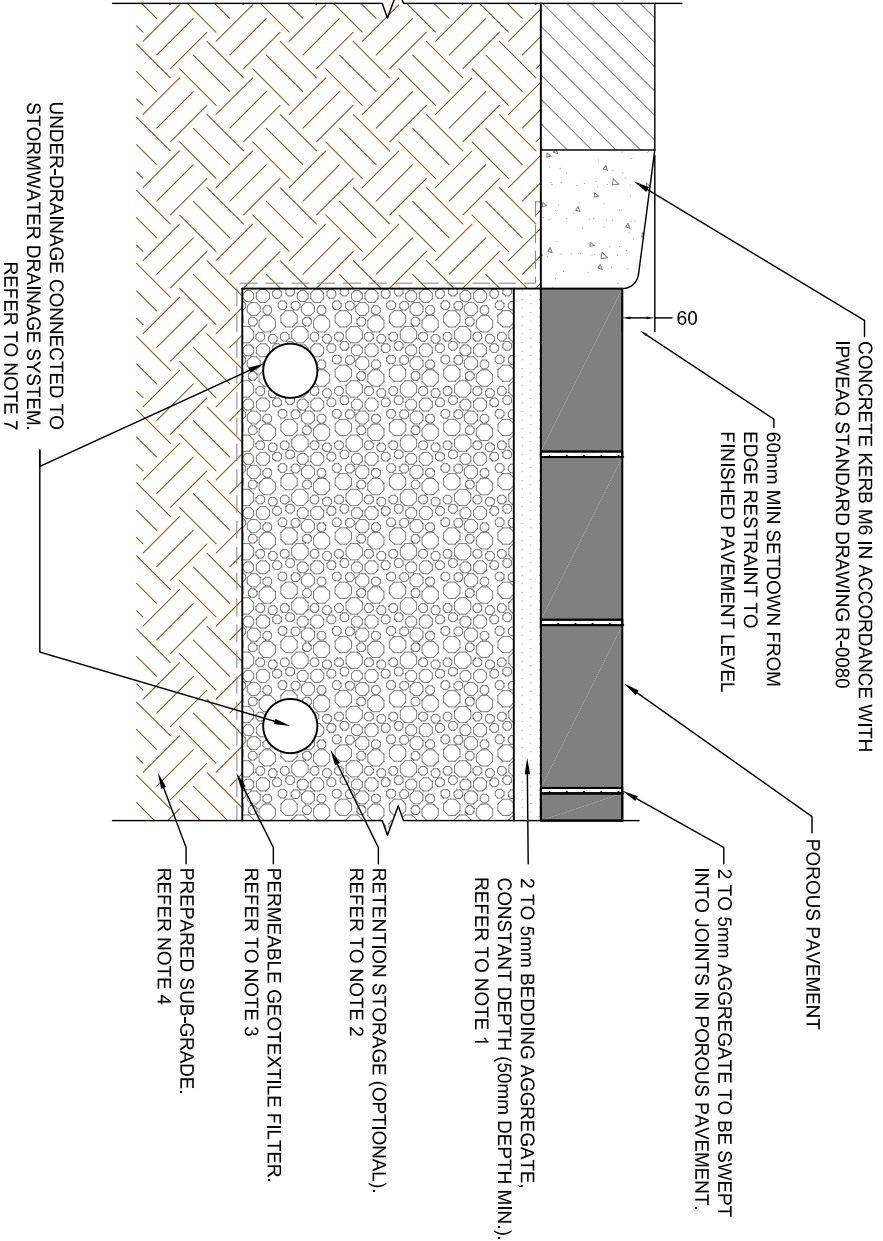


BIORETENTION SWALE - TYPICAL SECTION

[illegible]

NOTES

1. BEDDING AGGREGATE MATERIAL SHALL MEET MATERIAL AND GRADING COMPATIBILITY CRITERIA IN TECHNICAL SPECIFICATION FOR THE WORKS AND/ OR THE PAVEMENT MANUFACTURERS' TECHNICAL SPECIFICATIONS.
2. THE RETENTION STORAGE MEDIA SHALL COMPRISE COARSE, SOUND, CLEAN STONE OR ROCK OF GENERALLY UNIFORM PARTICLE SIZE (TYPICALLY 10 TO 63 mm SIZE) AND FREE FROM SILT/CLAY FINES OR OTHER DELETERIOUS MATTER, OR AS SPECIFIED IN THE PAVEMENT MANUFACTURE'S TECHNICAL SPECIFICATION.
3. NON-WOVEN GEOTEXTILE FILTER MEDIA NOT TO BE PLACED BETWEEN ANY FILTER LAYERS. IMPERVIOUS LINER MAY BE REQUIRED SUBJECT TO SOIL TESTING REQUIREMENTS IN ACCORDANCE WITH THE 'WATER SENSITIVE URBAN DESIGN TECHNICAL GUIDELINES' (WATER BY DESIGN).
4. SUB-GRADE TO BE RIPPED/ HARROWED PRIOR TO PLACEMENT OF GEOTEXTILE FILTER.
5. WHERE POSSIBLE, ANY RUNOFF DIRECTED TO POROUS PAVEMENTS SHALL BE PRE-TREATED TO REMOVE COARSE TO MEDIUM SEDIMENTS.
6. REFER TO MANUFACTURE'S SPECIFICATION FOR MAXIMUM TRAFFIC LOADING.
7. UNDER-DRAINAGE - SLOTTED PVC PIPE (uPVC OR SIMILAR TO AS2439.1) OR APPROVED EQUIVALENT, 0.5% MINIMUM GRADE, INSTALLED AT 1500mm MAXIMUM CENTRES, DIAMETER TYPICALLY 100-600mm, PIPE JOINS SHOULD BE GLUED WITH PLUMBING CEMENT. UNDER-DRAINAGE PIPE SHALL BE SEALED INTO PITS USING GROUT OR OTHER APPROVED WATERTIGHT SEAL, 50mm DRAINAGE LAYER (FINE AGGREGATE) COVER OVER SLOTTED PIPE.
8. DRAWING DETAIL BASED ON THE BRISBANE CITY COUNCIL DRAWING UMS-161 JUNE 2010.
9. POROUS PAVEMENT CAN PROVIDE AN ALTERNATIVE TO CONVENTIONAL IMPERMEABLE PAVEMENT IN LOCATIONS SUCH AS COMMERCIAL CAR PARK BAYS, RESIDENTIAL OR LIGHT COMMERCIAL DRIVEWAYS, INDUSTRIAL STORAGE AREAS OR LOADING ZONES, FOOTPATHS, CYCLEWAYS, PARKING PADS (E.G. MAINTENANCE ACCESS) AND TREE PIT SURROUNDS. THE FOLLOWING AREAS, HOWEVER, ARE NOT SUITABLE FOR PERMEABLE PAVING SYSTEMS (ADAPTED FROM GOLD COAST CITY COUNCIL 2007, COOMBS 2003):
 - WHERE A WATER TABLE IS LOCATED WITHIN 2M OF THE PROPOSED PAVEMENT SURFACE
 - AREAS WITH HIGH TRAFFIC VOLUMES OR WITH REGULAR HEAVY VEHICLE TRAFFIC
 - LOCATIONS WITH CLAY SOILS OR SOILS WITH A HYDRAULIC CONDUCTIVITY OF LESS THAN 0.36mm/hr
 - AREAS WHERE IMPERMEABLE ROCK IS LOCATED WITHIN 2m OF THE PROPOSED PAVEMENT SURFACE
 - LOCATIONS SUBJECT TO RUN-OFF WITH A HIGH SEDIMENT LOAD.
10. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.



POROUS PAVEMENT TYPICAL SECTION

			DRAWING TITLE
			POROUS PAVEMENT - TYPICAL SECTION
A	26 FEB 13	FIRST ISSUE	DRAWING No: MBRC - 2109
VERSION	DATE	COMMENTS	VERSION: A

1. FOR GENERAL DESIGN AND CONSTRUCTION NOTES REFER TO MBRC-2103.
2. CONCRETE WEIR - 300 WIDE X 800 HIGH CONCRETE (N32) WITH SL81 MESH PLACED CENTRALLY.
3. INSITU MATERIAL TO BE TESTED AND APPROVED BY GEOTECHNICAL ENGINEER PRIOR TO WEIR CONSTRUCTION.
4. GROUTED STONE PITCHING - STONES 75-100, 300 THICK ON FILTER CLOTH, REFER NOTE 4. REFER LANDSCAPE DRAWINGS AND PROJECT DRAWINGS FOR PLANT SPECIFICATION AND DETAILS. GEOTECHNICAL ENGINEER TO CONFIRM COMPACTION REQUIREMENTS FOR BUND SUBSOIL. OPTION TO DRILL 100 CORES THROUGH TO SUBSOIL TO PROVIDE VOIDS FOR PLANTING (SUBJECT TO FLOW VELOCITIES AND LOCAL GOVERNMENT REQUIREMENTS). REFER LANDSCAPE DRAWINGS FOR PLANTING DETAILS.
5. FOR EXTENT AND DETAILS OF SCOUR PROTECTION REFER TO PROJECT DRAWINGS.
6. BUND LEVEL, REFER TO PROJECT DRAWINGS FOR MINIMUM FREEBOARD REQUIREMENTS. BUND LEVELS MUST BE NOTED ON PROJECT DRAWINGS.
7. DRAWING DETAIL BASED ON THE INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA QUEENSLAND DIVISION INC. STANDARD DRAWINGS.
8. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.

The drawing consists of two parts: a cross-section (top) and a plan view (bottom).

Cross-section (top): Shows a concrete weir structure. The weir is a trapezoidal shape with a top width of 720mm MIN and a bottom width of 900mm MIN KEYED INTO BUND. The weir is labeled "CONCRETE WEIR". The weir level is indicated by a horizontal line. The weir length is indicated by a dimension line. The bund level is indicated by a horizontal line. The weir is shown with a concrete texture (diagonal lines).

Plan view (bottom): Shows the layout of the weir and bund. The weir is a rectangular structure with a concrete texture. The bund is a larger rectangular area surrounding the weir. The weir is labeled "A" and the bund is labeled "B". The weir is shown with a concrete texture (diagonal lines). The bund is shown with a concrete texture (diagonal lines). The weir is shown with a concrete texture (diagonal lines). The bund is shown with a concrete texture (diagonal lines).

SECTION B-B

The diagram illustrates a cross-section of a bridge structure. At the top, a horizontal line represents the road surface. Below it, a sloped line indicates the bridge deck. A vertical line marks the edge of the deck. A horizontal line below the deck represents the base of the structure. A vertical line on the right side of the diagram is labeled 'SCOUR PROTECTION'. A diagonal line on the left side is labeled 'GROUTED STONE PITCHING'. The area between the deck and the base is filled with a pattern of diagonal lines, representing the stone pitching. The area below the base is also filled with a pattern of diagonal lines, representing the scour protection. A small rectangular area is shown at the bottom right, possibly representing a foundation or a specific material layer.

SECTION A-A

Diagram illustrating the cross-section of a bioretention basin, showing the following components and layers:

- CONCRETE WEIR**: A structure at the top of the basin.
- 2000 MIN**: A dimension indicating the minimum depth of the basin.
- BIORETENTION FINISHED SURFACE LEVEL**: The ground surface level of the basin.
- GEOTEXTILE FILTER TO EXTEND TO BASE AND SIDES OF BIORETENTION BASIN**: A filter layer extending to the base and sides.
- GEOTEXTILE FILTER TO EXTEND 500 UNDER GROUTED ROCK SPOILS AND PINNED TO BATTER**: A filter layer extending under the rock spoils and pinned to the batter.
- GROUTED STONE PITCHING TO EXTEND TO SURFACE OF BASIN**: A layer of stone pitching extending to the surface.

						DRAWING TITLE
						HIGH FLOW WEIR DETAILS
						DRAWING No:
A	25 FEB '13	FIRST ISSUE				MBRC - 2112
VERSION	DATE	COMMENTS				VERSION:
						A

1. FOR GENERAL DESIGN AND CONSTRUCTION NOTES REFER TO MBRC-2103.
2. DRAWING DETAIL BASED ON THE INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA QUEENSLAND DIVISION INC. STANDARD DRAWINGS
3. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.



SECTION A-A

BIORETENTION FINISHED SURFACE LEVEL

INLET SCOUR PROTECTION

50mm MIN BETWEEN KERB TURNOUT AND FINISHED FILTER MEDIA

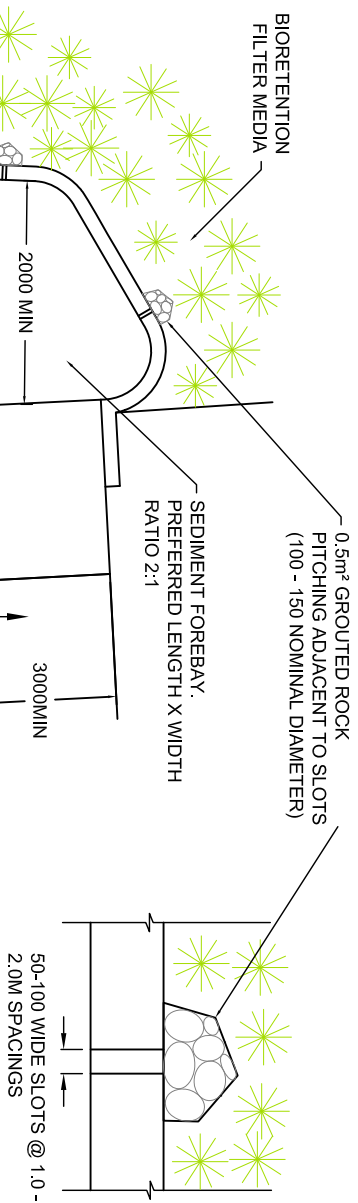
INSITU SOIL TO REMAIN INLET SCOUR PROTECTION BASE.
GEOTECHNICAL ENGINEER TO CONFIRM COMPACTION REQUIREMENTS. STRUCTURAL ENGINEER TO CONFIRM FOOTING REQUIREMENTS

150 THICK CONCRETE, SL62 REINFORCING, 50 TOP COVER, 1 IN 4 MAX

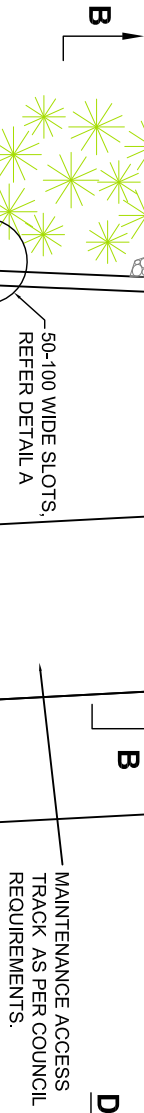
1 IN 4 PLANTED BATTER

LAY GEOTEXTILE FILTER OVER INSITU SOIL, 300 MIN. PIN FILTER TO INSITU SOIL AND LAY CONCRETE ONTO FILTER.

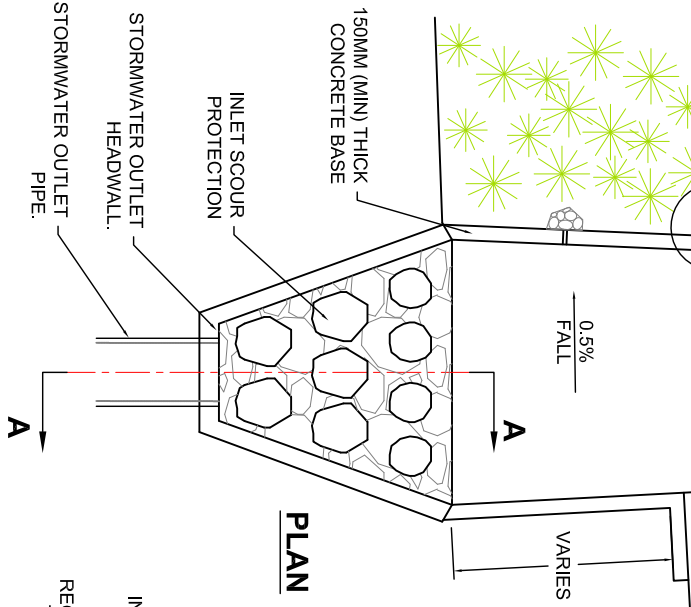
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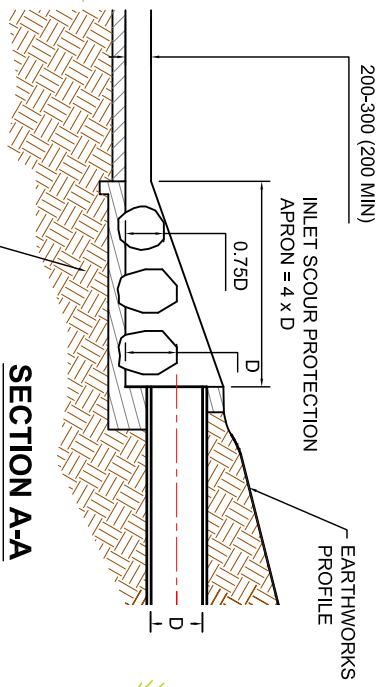
- NOTES**
1. FOR GENERAL DESIGN AND CONSTRUCTION NOTES REFER TO MBRC-2103.
 2. REFER PROJECT DRAWINGS FOR STORMWATER PIPE DIAMETER AND INVERT LEVEL.
 3. STORMWATER PIPE TO BE ALIGNED TO WITHIN A MAX OF 45° TO THE LONG AXIS OF THE COARSE SEDIMENT FOREBAY TO PROVIDE ENERGY DISSIPATION.
 4. DRAWING DETAIL BASED ON THE INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA QUEENSLAND DIVISION INC. STANDARD DRAWINGS
 5. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.



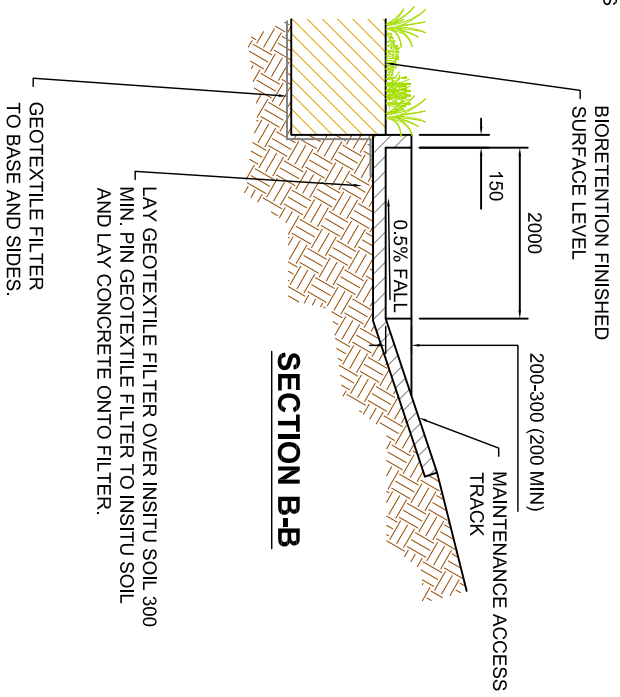
DETAIL A



PLAN



SECTION A-A

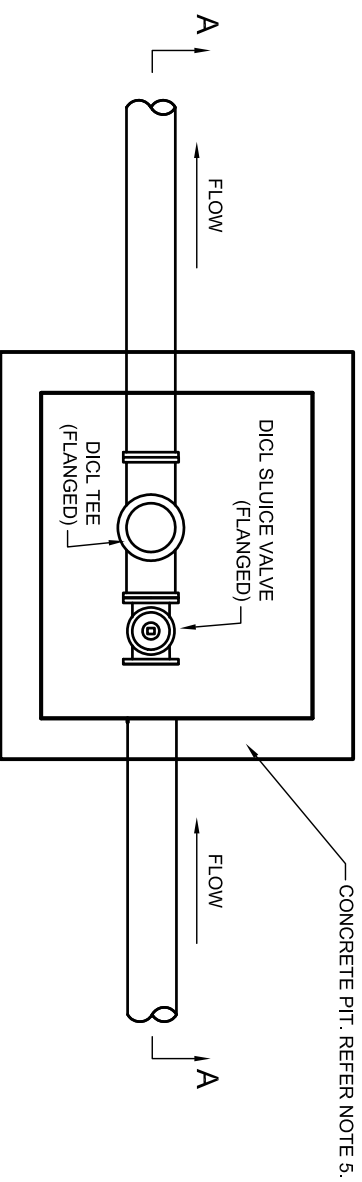


SECTION B-B

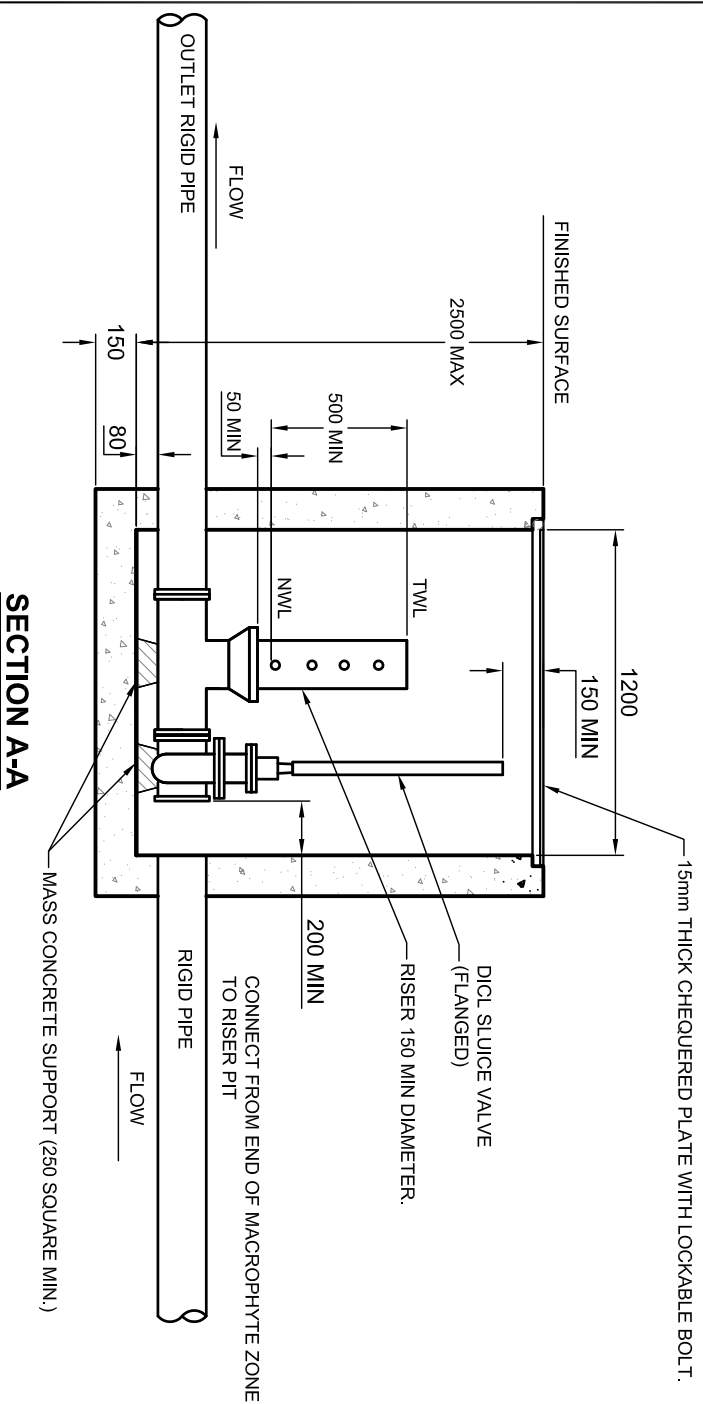
					DRAWING TITLE LARGE BIORETENTION SEDIMENT FOREBAY DRAWING No: MBRC - 2114 VERSION: A	
VERSION	DATE	COMMENTS				
A	25 FEB 13	FIRST ISSUE				

NOTES

1. FOR GENERAL DESIGN AND CONSTRUCTION NOTES REFER TO MBRC-2103.
2. REFER TO PROJECT DRAWINGS FOR RIGID PIPE DIAMETER AND INVERT LEVEL.
3. DICI SLUICE VALVE, REFER PROJECT DRAWINGS FOR VALVE SIZE. VALVE TO REMAIN IN CLOSED POSITION FOR NORMAL OPERATION. VALVE TO BE OPENED TO LOWER THE WATER LEVEL FOR MAINTENANCE OF THE WETLAND, BIORETENTION SYSTEM OR SEDIMENTATION BASIN.
4. RISER RIGID PIPE CL16, REFER TO PROJECT DRAWINGS FOR HOLES SIZES AND LOCATIONS. HOLE SIZE AND NUMBER AS PER RELEVANT SECTION OF "WATER SENSITIVE URBAN DESIGN TECHNICAL DESIGN GUIDELINES" (WATER BY DESIGN).
5. FOR PITS OVER 2500MM IN DEPTH, REFER PROJECT DRAWINGS FOR PIT DIMENSIONS AND REINFORCING DETAILS.
6. CONCRETE N25 IN ACCORDANCE WITH AS 1379 AND AS 3600.
7. LID AND FRAME TO BE HOT DIP GALVANISED AFTER FABRICATION TO AS 1650.
8. DRAWING DETAIL BASED ON THE INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA QUEENSLAND DIVISION INC. STANDARD DRAWINGS.
9. ALL DIMENSIONS IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.



PLAN

[illegible]