LGA Dams – Site inspection methodology, general asset information & inspection checklist

Asset name:	Walkerville RB
Locality:	Cnr Grevilla St & Panoramic Dr, Walkerville
Local government region:	South Gippsland
Date of inspection:	23 August 2017
Inspection team:	Ryan Glen, David Roche (SGSC) Greg Branson, Joe Matthews, Richard Mannix (SRW)
Weather conditions:	Cloud with some sun. Windy.
Temperature:	12°C

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1) Inspection Methodology

The inspection is to be undertaken at an **"Intermediate Level" consistent with the Australian National Committee on Large Dams (ANCOLD) Guidelines on Dam Safety Management (2003)**. However, testing of electrical or mechanical equipment and soil sampling for lab testing purposes will not take place due to time constraints.

Any deficiencies will be identified by visual examination of the dam and its appurtenant infrastructure and review of available surveillance data (if any).

Observations made during the inspections will be summarised in a checklist format (see Section 3 below).

The following consistent terms in Table 1 will be used throughout the inspection checklist and feed into the final inspection report to describe the condition of various features or components of the dam.

Table 1: Condition ratings (source: modified from GHD, 2017).

Satisfactory	Expected to fulfil its intended function.
Fair	Expected to fulfil its intended function, but maintenance is recommended.
Poor	May not fulfil its intended function; maintenance is necessary.
Unsatisfactory	Not expected to fulfil its intended function; repair, replacement, or modification is necessary.
Not applicable	Component/structure or item does not exist at this site.

Any recommendations for corrective action will be included in the final inspection report issued to DELWP with accompanying urgency and importance ratings (refer to Appendix A).

2) General Asset Information

Type	Assessment
General site inspection details	
Site Name	Walkerville RB
Locality	Cnr Grevilla St & Panoramic Dr, Walkerville
Map Reference (Coordinates)	Latitude = -38.820639 Latitude = 145.997557
Asset owner	South Gippsland Shire
Describe access to site	Retarding basin is accessed via Grevilla St.
Photograph of site access	
Storage level at time of inspection	At FSL.
Spillway flowing	Yes, approximately 30 L/min.
Site data	
General purpose	Retarding basin to attenuate storm flow.
Watercourse	N/A. Urban runoff catchment.
Original construction date (year)	1988
Subsequent upgrades or minor works	None known. Planned outlet structure raising (100 mm) October 2017 to increase capacity.
Historic incidents	Unknown.

Type	Assessment
Is there a current surveillance program?	No.
Historic surveillance reports reviewed? Details?	None provided.
Has an Emergency Plan or inundation map been provided?	No.
Catchment	
Description	Urban catchment ~0.38 km^2
Determination from	ArcGIS analysis. Indicative only.
Downstream flood area	
Description	PAR negligible. Breach on southern or eastern side toward dwellings but would attenuate before inundation occurred.
Determination from	ArcGIS analysis and field inspection.
Dam Wall (refer to drawings for more info)	
Construction type	Homogeneous earthfill.
Upstream face type	Homogeneous earthfill.
Downstream face type	Homogeneous earthfill.
Photograph of dam wall	

Type	Assessment
	
Crest length (m)	Northern and southern crest lengths ~65.0 m Eastern and Western crest lengths ~150.0 m
Crest width (m)	Northern and southern crest width 4.2m Eastern and Western crest width 3.5m
Surface area at FSL (m^2)	~ 10,500 m^2
Upstream slope (V:H or %)	RB at FSL so couldn't be measured. According to drawings: 1V:2H.
Downstream slope (V:H or %)	25% or 1V:4H.
Height at maximum section (m)	3.50 m field altimeter test at southern embankment.
Inlet works (refer to drawings for more info)	
Size	DN675 according to drawings (submerged during inspection).
Type	Grated mitred outlet with concrete headwall.
Inflow source	Prom Views Estate – Walkerville.

Type	Assessment
Photograph of inlet	Concrete headwall visible only (refer red outline) due to vegetation and storage level at time of inspection. 
Spillway (refer to drawings for more info)	
Location	N/A.
Type	N/A.
Structure details	N/A.
Freeboard (m)	N/A.
Photograph of outlet	N/A.
Outlet works (refer to drawings for more info)	
Size	DN375
Detail	Urgent Investigation Required. Riser outlet acting as side entry pit. Steel grate lid to prevent gross litter blocking outlet pipe when acting as glory hole spillway. No discharge through riser outlet as leakage around outlet emplacement and through embankment was occurring at time of inspection discharging via the outlet pipe (this indicates a break in the outlet pipe). Significant erosion around emplacement. Pipework exposed on u/s batter slope. Significant hole in crest offset ~0.5 m from outlet pipe alignment. Cause unknown but likely associated with leakage around outlet.
Discharge reason	Stormwater excess

Type	Assessment
Photograph of outlet	  

Type	Assessment
	

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Type	Assessment
Aerial site view	

3) Inspection Checklist

Type	Assessment[1]	Detail	Recommendation	Urgency Rating[2]	Importance Rating[3]
Dam wall					
Upstream batter					
General condition	Poor	Significant tree growth in northern and northern end of the eastern embankments.	Remove vegetation and clear around inlet and outlet structures.	Short Term Action	Medium
Embankment crest					
General condition	Poor	Erosion of embankment material at outlet structure. Possible piping action occurring.	Dewater RB and inspect cause of erosion and possible pipe breakage. Reinstate outlet structure to original design specification and reconstruct embankment to adequate compaction standard. Pipe should be concrete encased with a cross section shape to allow good compaction. Install appropriate filter around pipe to intercept any seepage.	Immediate Action Immediate Action Immediate Action Immediate Action	High High High High
Surface condition	Poor	Grass too long to adequately inspect true condition. Felt uneven when trafficked in vehicle.	Remove vegetation layer and cap crest with road base material (aggregates <20 mm). This will assist in identifying	Short Term Action	Medium

[1] Refer to condition assessment Table 1 on p.1
[2] Refer to urgency rating descriptions in Appendix A.1
[3] Refer to importance rating descriptions in Appendix A.2

Type	Assessment[1]	Detail	Recommendation	Urgency Rating[2]	Importance Rating[3]
			movement/ settlement in future.		
Downstream batter					
General condition	Poor	Significant tree growth on eastern side. Wombat hole on southeast corner of d/s batter. Soft in places indicating poor compaction.	Remove vegetation and burrows. If root and burrow penetration/ damage is significant reinstate embankment to adequate compaction standard.	Short Term Action	High
Surface condition	Poor	Significant tree growth in parts and grass too long to assess adequately.	Keep grass mown to short length.	Immediate Action	Low
Downstream Toe Area					
General condition	Poor	Ponding occurring at eastern embankment toe. Difficult to determine whether this is from seepage or recent rainfall. Drainage alignment along western and south western toe permanently wet. Soft in areas when tested with probe. Particularly at southern end. Water gathering at southern toe. Appears to be due to flows from spillway/outlet. This is resulting in saturated and soft toe.	Remove trees on eastern embankment toe and reinstate with drainage grade slope away from toe. Realign spoon drain channel away from western and southern toe. Consider excavating new spoon drain through adjacent property into drainage line.	Immediate Action	High
Reservoir Surrounds					
General condition	Fair	Requires regular mowing and vegetation removal.	See above.		

Type	Assessment[1]	Detail	Recommendation	Urgency Rating[2]	Importance Rating[3]
Spillway					
General condition	N/A	No spillway.	Consider installing spillway in northern crest for above design condition flow. Spillway will reduce freeboard but mitigate overtopping risk. Or, consider additional discharge capacity when upgrading existing riser outlet.	Immediate Action	High
Outlet works					
Intake structure or approach channel					
General condition	Unsatisfactory	Concrete in good visual condition, however not operating at time of inspection due to leakage through embankment at interface with riser emplacement. Top grate and side entry pit prone to blockage from gross litter and plant debris. Freeboard considered insufficient.	Review adequacy and configuration of outlet structure with a view to immediate upgrade due to existing preferential flow path through embankment.	Immediate Action	High
Outlet conduit/ pipework					
General condition	Unsatisfactory	Evidence of break in pipe as flow bypassing outlet discharging through outlet pipe on d/s side.	As above.	As above.	As above.
Discharge point					
General condition	Fair	Discharge point and channel immediately below requires cleaning and regular maintenance.	Refer to recommendations under Spillway and Downstream Toe Area.		

Type	Assessment[1]	Detail	Recommendation	Urgency Rating[2]	Importance Rating[3]
Inlet works					
General condition	N/A	Not sighted due to storage level at time of inspection.	Remove vegetation around inlet structure.	Short term action	High
Other comments/ observations					
Freeboard and outlet adequacy.		Large rainfall event could cause outlet pit trash screen to block and RB to overtop due to inadequate freeboard causing further damage to embankment and pipework where already compromised at outlet.	See above.		

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Appendix A

Table A.1 – Urgency Rating Descriptors (source: GHD, 2017).

Immediate Action	Critical actions that need to be taken immediately to safeguard the integrity of the dam.
Short Term Action	Operation, maintenance, investigation or monitoring issues requiring detailed attention or action to be completed within the next twelve months, in addition to normal routine actions.
Long Term Action	Lower priority, long-term operation, maintenance, investigation or monitoring issues that will require attention in the future; however, commencement may be deferred for twelve months, but require prudence during operation and routine inspections
Major Works	Items requiring capital works upgrades to address dam safety and/or business risks.
Documentation	Items regarding documentation of the dam and its current condition. These items do not require physical works on site however are recommended as part of a comprehensive dam safety management programme.
Consider	Further information is required to determine whether action should be carried out. For example, action may depend on further monitoring of the issue for signs of deterioration.

Table A.2 – Importance Rating Descriptors (source: GHD, 2017).

High	These recommendations have been made regarding actions required to address observed deficiencies in the condition and management of the dam, in order to avoid a dam safety incident. Generally, only 'immediate' and 'short-term' actions would be considered High priority.
Medium	These recommendations have been made regarding actions required to improve the surveillance and management of the dam, in order to detect in time those deficiencies that could eventually develop into a dam safety incident. Generally, only 'short-term' and 'long-term' actions would be considered Medium priority.
Low	These recommendations have been made regarding actions required to improve the operation, maintenance and surveillance of the dam to meet current good practice. These recommendations also deal with issues that are not currently a threat to dam safety, but are required to avoid increased operation, maintenance and surveillance activities and costs. Generally, only 'short-term' and 'long-term' actions would be considered Low priority.

General Notes:

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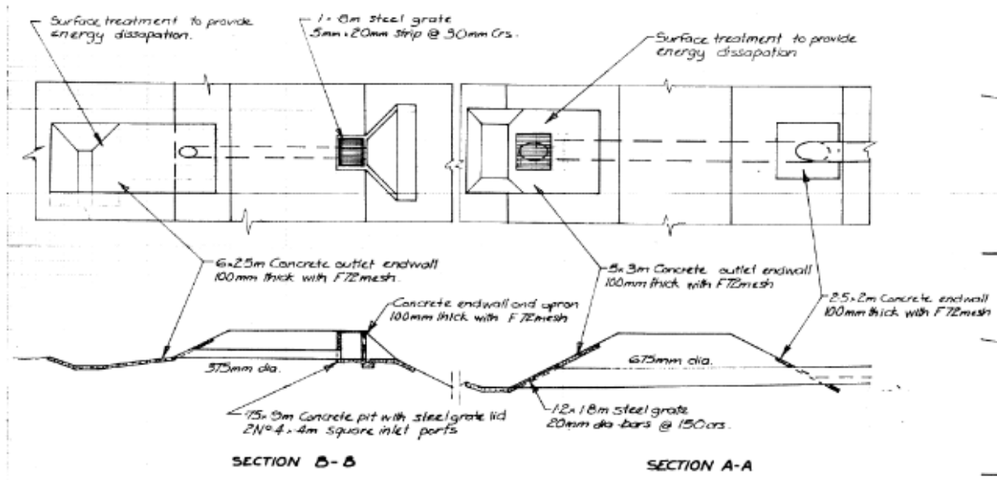
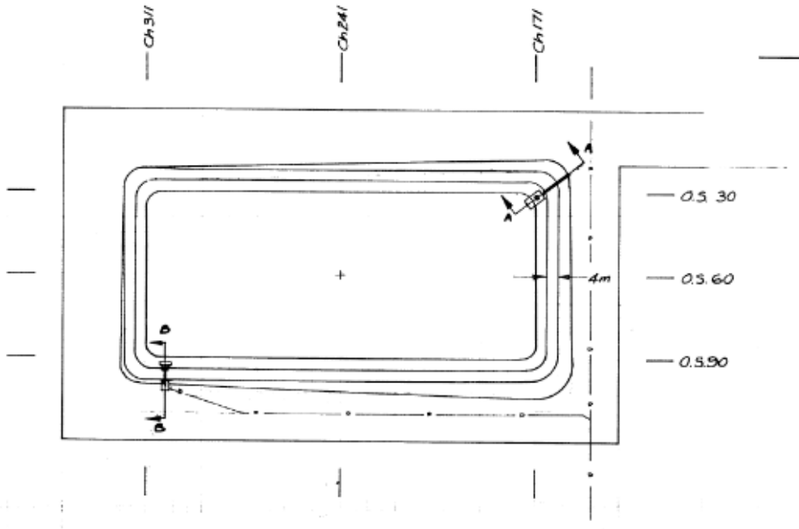


SECTION B-B SECTION A-A

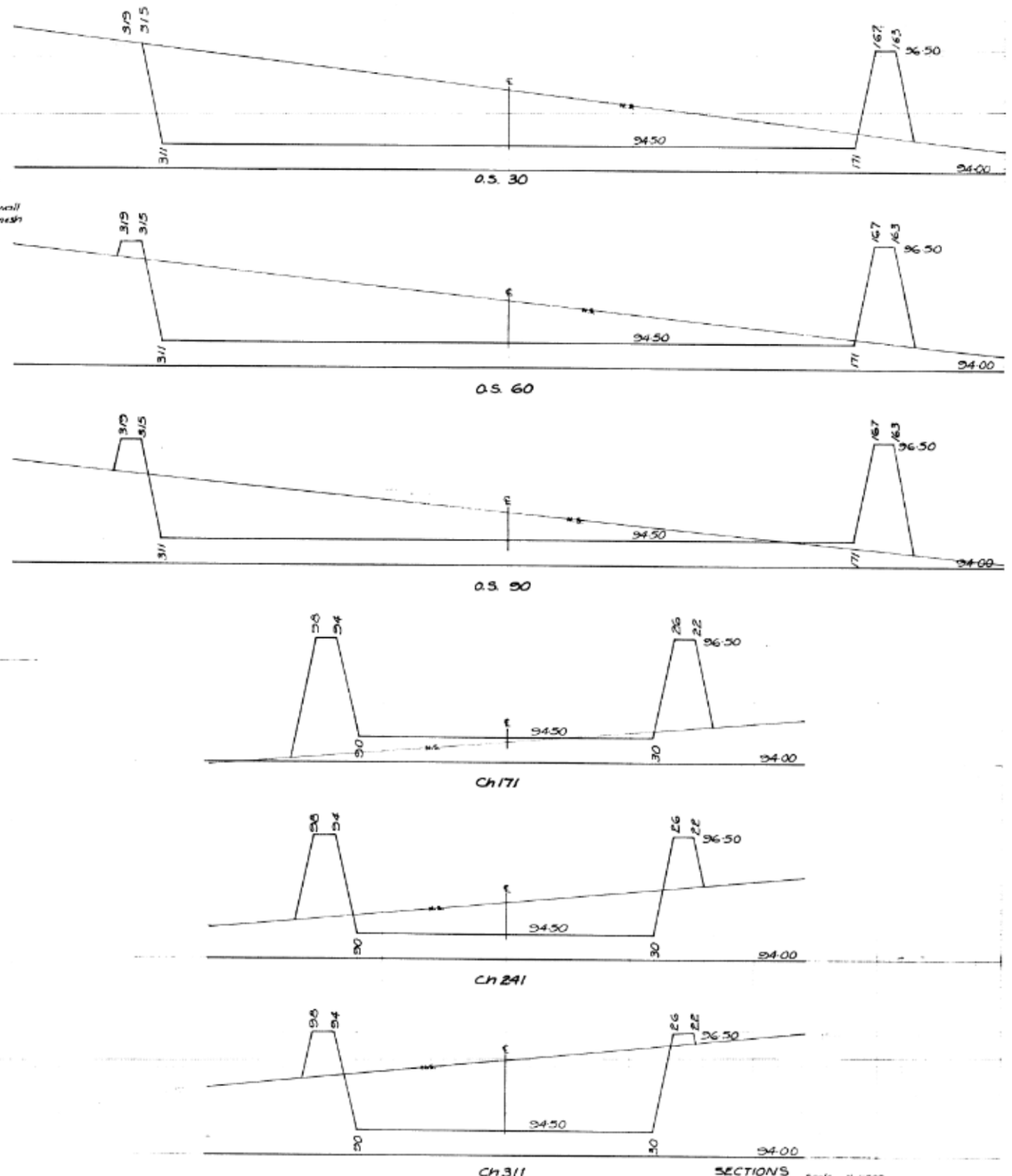
RETARDING BASIN INLET AND OUTLET STRUCTURES

Scale 1:100



PLAN OF RETARDING BASIN

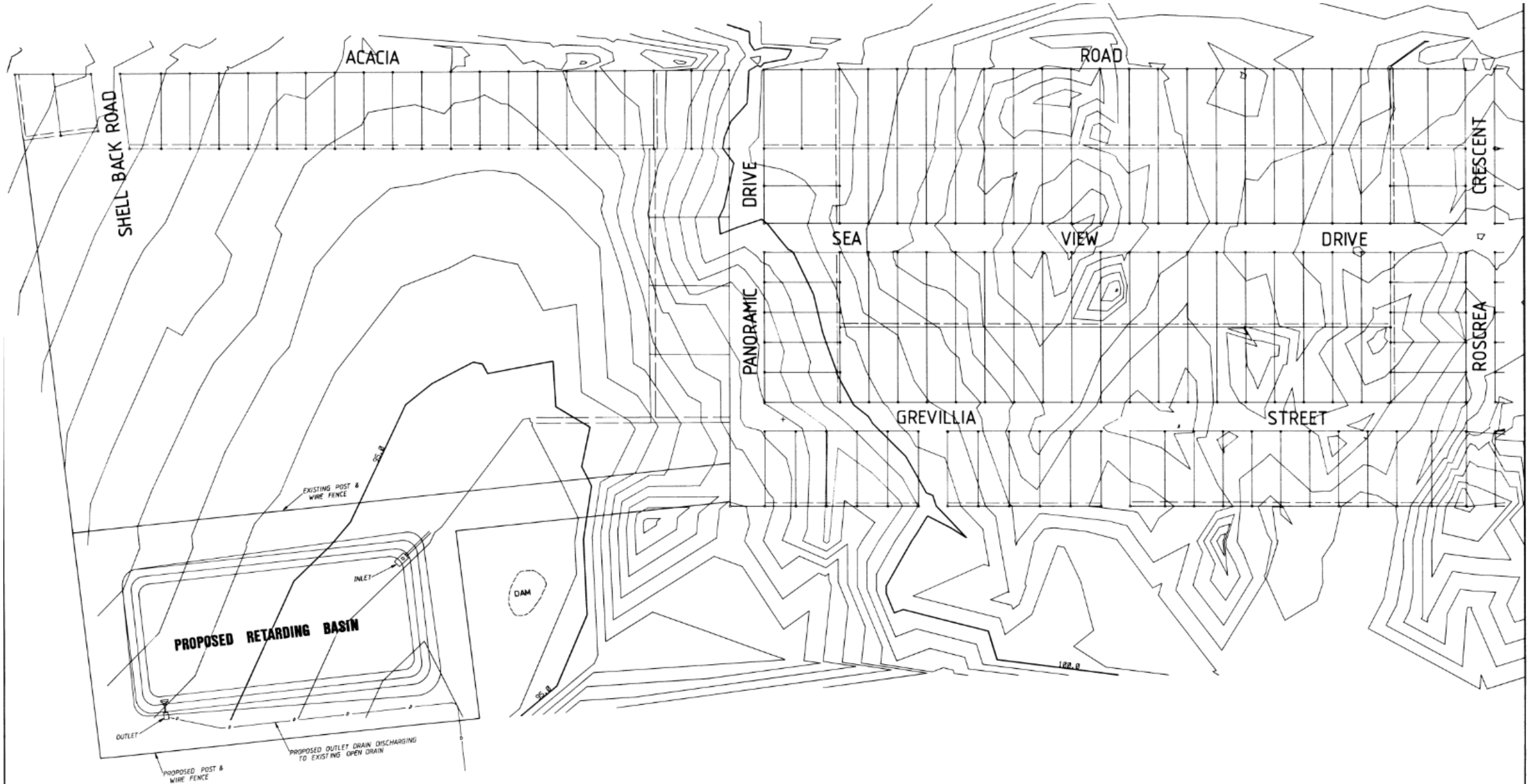
Scale 1:1000



SECTIONS

Scale H 1:500 V 1:50

SCALE OF METRES	SHIRE OF WOORAYL	SCALE		DATE	LEVEL BOOK / FILE N°
Horizontal 0	PROMONTORY VIEWS ESTATE	DRAWN	A.E.C.	FEB 88	APPROVED
Vertical 0	DRAINAGE SCHEME	DESIGNED	A.E.C.	FEB 88	SHIRE ENGINEER
	RETARDING BASIN DETAILS	CHECKED			DATE 12.2.88
					PLAN FILE N° 30-160
					16 OF 16



AMENDMENTS	DATE
Retarding basin & dam added	23/4/90

SCALE OF METRES
0 10 20 30 40 50 60
Horizontal
0
Vertical

SHIRE OF WOORAYL

PROMONTORY VIEWS ESTATE
DRAINAGE SCHEME
CONTOUR PLAN SHEET 2

SURVEY	A.E.C.	DATE	LEVEL BOOK	FILE No.
DRAWN	A.E.C.	FEB 88	APPROVED	PLAN FILE No. 30-160
DESIGNED	A.E.C.	FEB 88	SHIRE ENGINEER	4 OF 16
CHECKED			DATE 12.2.88	