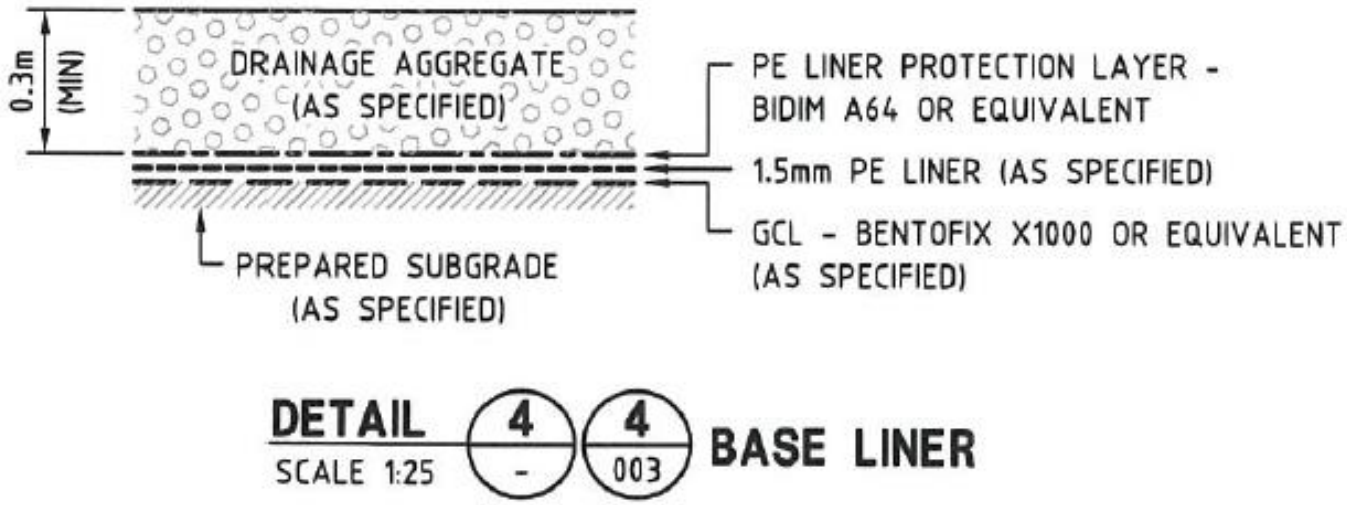
New Chum – Cell 2 Liner System



New Chum – Cell 2 PE Liner details

Property	Test Method	Required Values
Specific Gravity	ASTM D792 Method A or ASTM D1505	0.915 to 0.935
Melt Index	ASTM D1238E	<0.6 g/10 min
Carbon Black Content	ASTM D1603	2 - 3 %

Property	Test Method	Required Values
Thickness	ASTM D 1593	1.50mm min
Density	ASTM D 1505	0.925 - 0.935
Asperity Height	ASTM GM 12	0.25mm min
Melt Index	ASTM D 1238E	<0.6 gm/10min
Carbon Black Content	ASTM D 1603	2 - 3%
Carbon Black Dispersion	ASTM D3015	A1
Tensile Properties	ASTM D 638	
1. Ultimate Tensile Strength	Type IV specimen at 2 inches/minute	40kN/m min
2. Ultimate Elongation		500% min
3. Yield Tensile Strength		22kN/m min
4. Yield Elongation		12% min
Tear Strength	ASTM D 1004 Die C	200N min
Dimensional Stability	ASTM D1204 212°F, 15 min	± 1%

New Chum – Cell 2 GCL details

X1000 Product (referred to as Grade 1)

- Geosynthetic Mass not less than 380 g/m^2
- Sodium Bentonite Mass not less than 4,500g/m^2

GCL Specification	Drawing No.	unit	Grade 1 X1000 Product	Grade 2 X2000 Product	Test method
Geotextile Protection Layer	PP nonwoven white	g/m^2	270	270	AS3706.1
Geotextile Carrier Layer	PP slit film woven	g/m^2	110	110	
	PP nonwoven white	g/m^2	None	270	
Bentonite Layer	Sodium Bentonite Sealing layer (@0% m.c)	g/m^2	4000	3700	ASTM D5993
	Moisture Content (maximum from factory)	%	15	15	
	Sodium Bentonite Side Overlap Area (@0% m.c) - Typical Values	g/m^2	800	800	Strew Test
Wide Width Tensile Strength	Machine Direction	kN/m	8	10	ASTM D4595
	Cross-Machine Direction	kN/m	8	25	
Wide Width Tensile Elongation	Machine Direction	%	11	100	ASTM D4595
	Cross-Machine Direction	%	11	70	
CBR Burst	Strength	N	≥ 1600	≥ 2500	AS3706.4
	Elongation	%	≥ 20	≥ 50	
Hydrated Peak Internal Shear Strength - Typical Values	@10kPa Normal Stress	kPa	30	35	ASTM D6243
	@30kPa Normal Stress	kPa	50	60	
Permeability	k-value (t_{GCL}=10mm)	m^3/s	$\leq 3 \times 10^{-11}$	$\leq 3 \times 10^{-11}$	ASTM D5887

New Chum – Cell 2 sub-grade details

Prior to compaction, Engineered Fill shall be broken up and/or rock raked as required, laid out in a layer of approximately uniform loose thickness and be brought to a moisture content within the range of ±3% of Optimum Moisture Content (AS 1289.5.5.1) by wetting, or aeration and drying (as the case may be), and/or blending and mixing wet and dry materials. Engineered Fill material shall be spread in layers which do not exceed 300mm loose thickness and compacted by a minimum of 4 passes using a 12t vibrating sheepsfoot roller or approved equivalent such that a competent platform, containing minimal voids and not subject to significant deflection under the trafficking of the haul plant, is achieved to the satisfaction of the Superintendent. Engineered Fill shall be mixed and/or conditioned thoroughly so that immediately prior to compaction, the moisture content of the fill is reasonably uniform within any one area.

New Chum – Cell 2 layout