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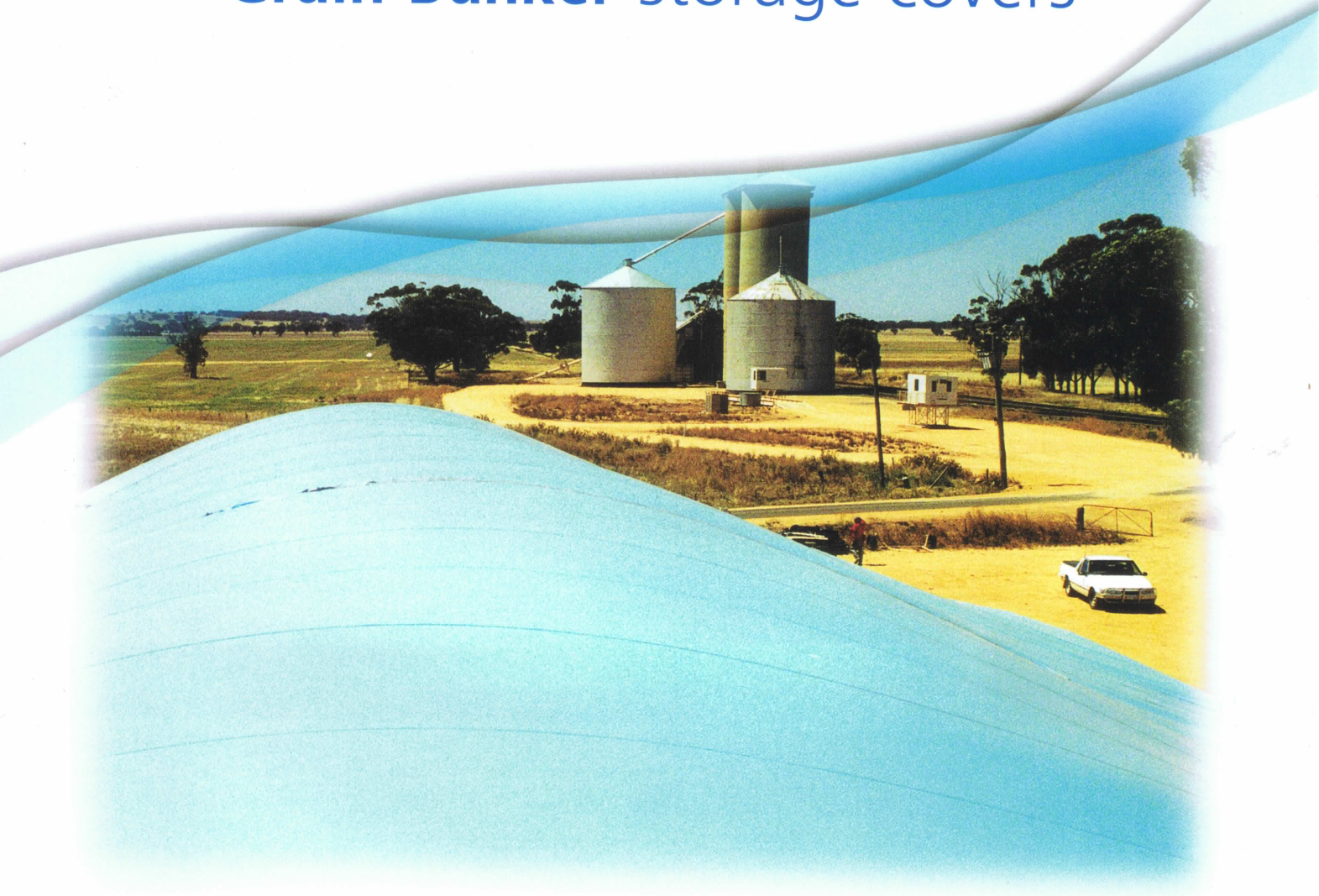
Synthesis on-farm **Grain Bunker** storage covers



On-site storage using Landmark covers

The grain bunker storage system constructed under farm conditions has long been an accepted method in providing storage of grain throughout Australia.

Many years of experience have proved that technology for constructing large-scale bunker storage can be applied successfully to scaled-down on-farm versions to provide reliable and cost effective protection.

Having determined the need for on-farm grain storage it is important to consider the type of construction materials required and how long it will be expected to provide reliable protection.

The Bunker

A bunker storage consists of three retaining walls which are lined and filled with grain. A suitable cover is placed over the grain pile and sealed to keep out water, insects and other contaminants.

Site Selection and Positioning

The bunker must be sited on a well drained area where the water table is well below the surface. Surface vegetation needs to be removed and the bunker should not be placed close to trees (which could drop limbs on to the top cover during storms). It is advisable to face the closed end of the bunker into the prevailing wind to reduce problems when placing the top cover. Good access to the site for vehicles and handling equipment is also important, of course.

Synthesis
Advanced Polymer Fabrics

Bunker Dimensions

The first factor to consider when determining a bunker dimension is the height to which your grain handling equipment can form a stack of grain. This height, together with side retaining wall height, determines the distance required between each side (see tables 1-6). When assessing your stack height remember that a particular type of grain will form a heap relevant to its angle of repose: 23° to horizontal for wheat, 26° for barley and sorghum, 30° for oats (as illustrated in diagram 1).

The auger must also be positioned far enough back to prevent the undercarriage being excessively buried by grain during filling. It may be desirable in some instances to attach an extension piece to the auger outlet to achieve greater bunker height (see diagram 5).

Once the grain height has been determined, the dimensions of a bunker to store a particular quantity of grain can be arrived at from tables 1-6. Note that these tables refer to bunkers with a wall height of either 0.5 or 1.0 metres.

It may be advantageous to spread your total storage requirements over several small bunkers rather than confine storage to one very large bunker.
For example, two 400t storages could be constructed rather than a single 800t unit. By doing this, the cover sheets will be kept to a manageable size and bunkers can be located at several convenient sites.

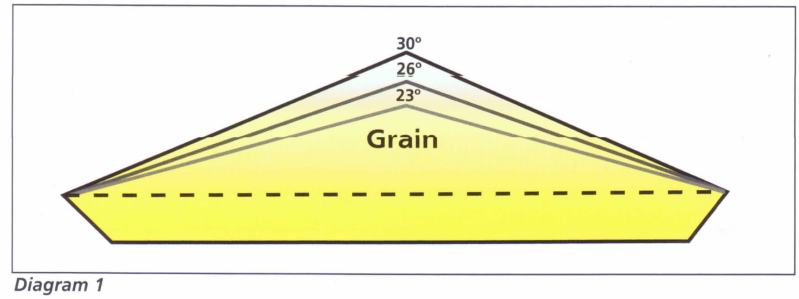


Diagram 1

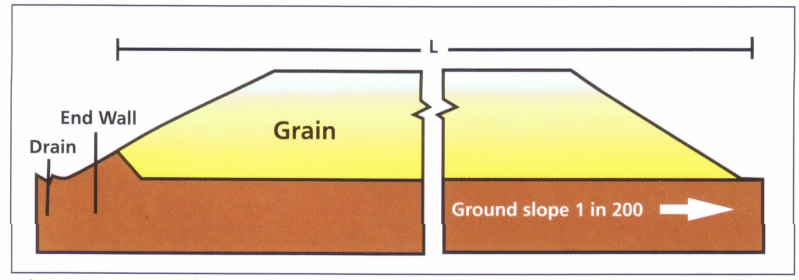


Diagram 2

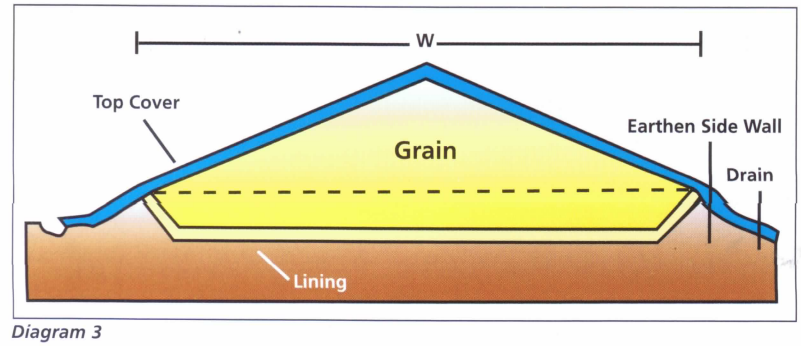


Diagram 3

Tables 1-6: Bunker Dimensions

Table 1: WHEAT — Repose Angle 23° — 750kg per cubic metre — Bank Height .5 metre

Wheat Height (m)	Width (m)	Length 200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	Length per 50t
2.0	7.25	35.1	50.6	66.1	81.6	97.2	112.7	128.2	143.8	159.3	237.0	314.6	392.3	7.76
2.5	9.50	24.3	33.9	43.5	53.1	62.7	72.3	81.9	91.5	101.1	149.1	197.1	245.1	4.80
3.0	11.75	19.3	25.8	32.4	38.9	45.5	52.0	58.6	65.1	71.7	104.4	137.1	169.9	3.27
3.5	14.25	16.18	21.6	26.3	31.1	35.9	40.6	45.4	50.1	54.9	78.7	102.5	126.3	2.37
4.0	16.50		19.3	22.9	26.5	30.2	33.8	37.4	41.0	44.6	62.7	80.8	98.9	1.80
4.5	18.75			21.0	23.8	26.7	29.5	32.4	35.2	38.1	52.3	66.5	80.7	1.42
5.0	21.25					24.6	26.8	29.1	31.4	33.7	45.2	56.7	68.2	1.14
5.5	23.50						25.2	27.1	29.0	30.9	40.3	49.8	59.3	0.94
6.0	25.75								27.4	29.0	36.9	44.9	52.8	0.79

Table 2: BARLEY & SORGHUM — Repose Angle 26° — 650kg per cubic metre — Bank Height .5 metre

Barley Height (m)	Width (m)	Length 200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	Length per 50t
2.0	6.25	44.9	65.6	86.2	106.9	127.6	148.3	169.0	189.7	210.3	313.8	417.2	520.6	10.34
2.5	8.25	30.0	42.7	55.5	68.3	81.0	93.8	106.6	119.3	132.1	195.9	259.8	323.6	6.38
3.0	10.25	22.8	31.5	40.2	48.9	57.6	66.3	75.0	83.7	92.4	135.9	179.4	222.8	4.34
3.5	12.25	19.0	25.3	31.6	38.0	44.3	50.6	56.9	63.2	69.6	101.1	132.7	164.3	3.15
4.0	14.50	17.0	21.8	26.6	31.4	36.2	41.0	45.8	50.6	55.4	79.4	103.4	127.4	2.40
4.5	16.50		19.7	23.5	27.2	31.0	34.8	38.6	42.4	46.1	65.0	83.9	102.8	1.88
5.0	18.50			21.6	24.6	27.7	30.7	33.8	36.8	39.9	55.1	70.3	85.6	1.52
5.5	20.50				22.9	25.5	28.0	30.5	33.0	35.5	48.1	60.6	73.2	1.25
6.0	22.50					24.0	26.1	28.3	30.4	32.5	43.0	53.5	64.1	1.05

Table 3: OATS

Repose Angle 30° 400kg per cubic metre Bank Height .5 metre

Oats Height (m)	Width (m)	Length											Length per 50t
		200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	
2.0	5.25	83.0	123.1	163.1	203.1	243.2	283.2	323.3	363.3	403.3	603.5	803.6	1003.8	20.10
2.5	6.75	53.1	77.7	102.4	127.0	151.7	176.3	201.0	225.6	250.3	373.5	496.8	620.0	12.32
3.0	8.75	38.1	54.9	71.7	88.4	105.2	122.0	138.8	155.5	172.3	256.2	340.0	423.9	8.38
3.5	10.50	29.7	41.9	54.1	66.3	78.4	90.6	102.8	115.0	127.1	188.0	248.9	309.8	6.08
4.0	12.25	24.7	34.0	43.2	52.5	61.7	71.0	80.2	89.5	98.7	145.0	191.2	237.5	4.62
4.5	13.75	21.6	28.9	36.2	43.4	50.7	58.0	65.2	72.5	79.8	116.1	152.5	188.8	3.63
5.0	15.50	19.7	25.5	31.4	37.3	43.1	49.0	54.9	60.7	66.6	95.9	125.3	154.6	2.93
5.5	17.50	18.5	23.3	28.1	33.0	37.8	42.6	47.5	52.3	57.1	81.3	105.5	129.7	2.41
6.0	19.25		21.8	25.9	29.9	34.0	38.0	42.1	46.1	50.2	70.4	90.7	111.0	2.02

Table 4: WHEAT

Repose Angle 23° 750kg per cubic metre Bank Height 1 metre

Wheat Height (m)	Width (m)	Length											Length per 50t
		200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	
2.0	4.75	48.9	70.9	92.9	114.8	136.8	158.8	180.7	202.7	224.7	334.6	444.4	554.3	10.98
2.5	7.25	28.7	40.5	52.2	63.9	75.6	87.4	99.1	110.8	122.6	181.2	239.8	298.5	5.86
3.0	9.50	21.0	28.5	35.9	43.4	50.9	58.3	65.8	73.3	80.7	118.1	155.5	192.8	3.73
3.5	11.75	17.4	22.7	27.9	33.1	38.3	43.6	48.8	54.0	59.3	85.4	111.5	137.7	2.61
4.0	14.25		19.6	23.5	27.4	31.3	35.2	39.1	42.9	46.8	66.2	85.6	105.1	1.94
4.5	16.50			21.1	24.1	27.1	30.1	33.1	36.1	39.1	54.1	69.2	84.2	1.50
5.0	18.75				22.1	24.5	26.9	29.3	31.7	34.1	46.1	58.1	70.1	1.20
5.5	21.25						25.0	26.9	28.9	30.9	40.7	50.5	60.3	0.98
6.0	23.50								27.1	28.7	36.9	45.1	53.3	0.81

Table 5: BARLEY & SORGHUM

Repose Angle 26° 650kg per cubic metre Bank Height 1 metre

Barley Height (m)	Width (m)	Length											Length per 50t
		200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	
2.0	4.25	64.2	94.1	124.0	153.8	183.7	213.6	243.5	273.3	303.2	452.6	601.9	751.3	14.93
2.5	6.25	36.2	52.0	67.7	83.5	99.2	115.0	130.7	146.5	162.3	241.1	319.9	398.6	7.87
3.0	8.25	25.3	35.3	45.3	55.3	65.3	75.2	85.2	95.2	105.2	155.2	205.1	255.1	4.99
3.5	10.25	20.1	27.0	34.0	41.0	48.0	54.9	61.9	68.9	75.8	110.7	145.6	180.4	3.48
4.0	12.50	17.3	22.5	27.7	32.8	38.0	43.2	48.4	53.5	58.7	84.6	110.4	136.3	2.58
4.5	14.35		19.9	23.9	27.9	31.9	35.9	39.9	43.9	47.9	67.9	87.9	107.9	1.99
5.0	16.50			21.6	24.8	28.0	31.2	34.4	37.6	40.8	56.7	72.7	88.6	1.59
5.5	18.50				22.9	25.5	28.1	30.7	33.3	35.9	48.9	62.0	75.0	1.30
6.0	20.50					23.8	26.0	28.2	30.4	32.5	43.4	54.3	65.1	1.08

Table 6: OATS

Repose Angle 30° 400kg per cubic metre Bank Height 1 metre

Oats Height (m)	Width (m)	Length											Length per 50t
		200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	
2.0	3.50	123.1	182.7	242.3	301.9	361.5	421.1	480.6	540.2	599.8	897.7	1195.6	1493.5	29.79
2.5	5.25	65.8	96.7	127.6	158.5	189.4	220.3	251.2	282.1	313.0	467.4	621.9	776.3	15.44
3.0	6.75	43.5	62.9	82.4	101.8	121.2	140.7	160.1	179.6	199.0	296.3	393.5	490.7	9.72
3.5	8.75	32.3	45.8	59.3	72.8	86.4	99.9	113.4	126.9	140.5	208.1	275.7	343.3	6.76
4.0	10.50	26.0	36.0	46.0	56.0	66.0	76.0	86.0	96.0	106.0	156.1	206.1	256.2	5.00
4.5	12.25	22.2	29.9	37.6	45.4	53.1	60.8	68.6	76.3	84.0	122.7	161.3	200.0	3.86
5.0	13.75	19.8	26.0	32.2	38.3	44.5	50.6	56.8	63.0	69.1	99.9	130.8	161.6	3.08
5.5	15.50	18.4	23.4	28.5	33.5	38.5	43.6	48.6	53.6	58.7	83.8	109.0	134.2	2.51
6.0	17.25		21.7	25.9	30.1	34.3	38.5	42.7	46.9	51.1	72.0	93.0	114.0	2.09

Drainage

Good drainage planning will certainly pay dividends when large quantities of rain water run-off from covers are to be diverted along with perimeter water accumulations. Aim to keep the bunker floor above the surrounding ground level. A floor slope of about 1 in 200 from the closed end, properly levelled to avoid dips, will assist drainage and prevent water accumulating as the bunker is emptied. You may even choose to harvest this water runoff and perhaps store it in a secure, lined dam. Ask your supplier about Synthesis Canvacon® pond and dam liners for effective water management.

Earthworks

Once the site has been cleared, earth walls are readily constructed using a grader, dozer, offset blade on a tractor or other earthmoving equipment. Walls should be constructed as smooth as conditions permit, in a roughly triangular shape. Soil types that permit compaction should pose no problems in preparing retaining walls 1 metre high. Half metre walls may have to be opted for with poorer soils if uniform height is to be maintained during the following construction procedures.The closed end wall should be shaped to the same dimensions as the side walls to form a radius equal to half the distance between the parallel side walls. This semi-circular end wall eliminates the need to fill corners with grain.

Selecting Covers

The degree of risk you are prepared to accept when storing grain will influence the final selection of a suitable cover. As a general rule, the lighter non-reinforced plastic covers will not give the degree of reliable protection warranted by the investment in stored grains.

For reliable bunker protection, covers fabricated from either Synthesis Canvacon® or the heavier Synthesis Landmark®, will provide:

- resistance for handling and wind loads
- a product designed in Australia for Australian conditions
- longer life when exposed to sunlight (UV resistance)
- resistance to water penetration
- ease of handling
- resistance to puncturing
- more than one season's use

Specify Canvacon with confidence, or the heavier Landmark (both with a 3 year UV warranty). Discuss with your fabricator which product may suit your circumstances better.

Tables 7-12 show cover sizes to suit a range of storage sizes and stack heights. Single piece covers are manufactured from a number of widths of fabric welded together to provide a strong and superior impermeable cover.

The selected fabric can be supplied as a welded sheet or sheets in a form ready to be used to cover the stack. The use of sheets and methods of joining, if necessary, should be discussed with the fabricator who will be able to supply manufacturer's recommendations.

Tables 7-12: Cover Dimensions

Table 7: WHEAT — Repose Angle 23° — 750kg per cubic metre — Bank Height .5 metre

Grain Height (m)	Width (m)	Length 200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	Length per 50t
2.0	12.25	39.0	54.6	70.1	85.6	101.2	116.7	132.2	147.8	163.3	241.0	318.6	396.3	7.76
2.5	14.75	28.5	38.1	47.1	57.3	66.9	76.5	86.1	95.7	105.3	153.3	201.3	249.3	4.80
3.0	17.50	23.7	30.2	36.8	43.3	49.9	56.4	63.0	69.5	76.1	108.8	141.5	174.3	3.27
3.5	19.75	21.4	26.2	31.0	35.7	40.5	45.2	50.0	54.7	59.5	83.3	107.1	130.9	2.37
4.0	22.50		24.1	27.7	31.4	35.0	38.6	42.2	45.8	49.4	67.5	85.6	103.7	1.80
4.5	25.25			26.0	28.8	31.7	34.5	37.4	40.2	43.1	57.3	71.5	85.7	1.42
5.0	27.50					29.8	32.1	34.4	36.7	38.9	50.4	61.9	73.4	1.14
5.5	30.25						30.6	32.5	34.4	36.3	45.7	55.2	64.7	0.94
6.0	32.75								33.0	34.6	42.5	50.5	58.4	0.79

Table 8: BARLEY & SORGHUM — Repose Angle 26° — 650kg per cubic metre — Bank Height .5 metre

Grain Height (m)	Width (m)	Length 200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	Length per 50t
2.0	11.25	48.8	69.5	90.2	110.9	131.6	152.2	172.9	193.6	214.3	317.7	421.1	524.6	10.34
2.5	13.50	34.1	46.9	59.7	72.4	85.2	98.0	110.7	126.5	136.3	200.1	264.0	327.8	6.38
3.0	15.75	27.2	35.9	44.6	53.3	62.0	70.7	79.4	88.1	96.8	140.3	183.8	227.3	4.34
3.5	17.75	23.7	30.0	36.3	42.6	48.9	55.2	61.6	67.9	74.2	105.8	137.4	169.0	3.15
4.0	20.25	21.8	26.6	31.5	36.3	41.1	45.9	50.7	55.5	60.3	84.3	108.3	132.3	2.40
4.5	22.50		24.8	28.6	32.4	36.1	39.9	43.7	47.5	51.2	70.1	89.0	107.9	1.88
5.0	24.75			26.7	30.0	33.0	36.0	39.1	42.1	45.2	60.4	75.7	90.9	1.52
5.5	27.25				28.5	31.0	33.5	36.1	38.6	41.1	53.6	66.2	78.8	1.25
6.0	29.50					29.8	31.9	34.1	36.2	38.3	48.8	59.3	69.9	1.05

Table 9: OATS — Repose Angle 30° — 400kg per cubic metre — Bank Height .5 metre

Grain Height (m)	Width (m)	Length 200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	Length per 50t
2.0	10.00	87.0	127.0	167.0	207.1	247.1	287.1	327.2	367.2	407.2	607.4	807.6	1007.7	20.01
2.5	12.00	57.3	81.9	106.6	131.2	155.9	180.5	205.2	229.8	254.5	377.7	501.0	624.2	12.32
3.0	14.00	42.6	59.4	76.1	92.9	109.7	126.5	143.2	160.0	176.8	260.6	344.5	428.4	8.38
3.5	16.00	34.5	46.7	58.8	71.0	83.2	95.4	107.5	119.7	131.9	192.8	253.6	314.5	6.08
4.0	18.00	29.7	39.0	48.2	57.4	66.7	76.0	85.2	94.5	103.7	150.0	196.2	242.5	4.62
4.5	20.00	26.9	34.2	41.4	48.7	56.0	63.2	70.5	77.8	85.1	121.4	157.8	194.1	3.63
5.0	22.00	25.2	31.1	36.9	42.8	48.7	54.5	60.4	66.3	72.1	101.5	130.8	160.1	2.93
5.5	24.00	24.3	29.1	33.9	38.8	43.6	48.4	53.3	58.1	62.9	87.1	111.3	135.5	2.41
6.0	26.00		27.9	31.9	36.0	40.0	44.1	48.2	52.2	56.3	76.5	96.8	117.1	2.02

Table 10: WHEAT — Repose Angle 23° — 750kg per cubic metre — Bank Height 1 metre

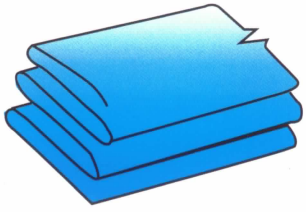
Grain Height (m)	Width (m)	Length 200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	Length per 50t
2.0	12.25	54.1	76.1	98.0	120.0	142.0	163.9	185.9	207.9	229.9	339.7	449.6	559.5	10.98
2.5	14.75	34.1	45.8	57.6	69.3	81.0	92.7	104.5	116.2	127.9	186.6	245.2	303.8	5.86
3.0	17.50	26.6	34.0	41.5	49.0	56.4	63.9	71.4	78.9	86.3	123.7	161.0	198.4	3.73
3.5	19.75	23.2	28.4	33.7	38.9	44.1	49.3	54.6	59.8	65.0	91.2	117.3	143.4	2.61
4.0	22.50		25.6	29.5	33.4	37.3	41.2	45.0	48.9	52.8	72.2	91.6	111.0	1.94
4.5	25.25			27.3	30.3	33.3	36.3	39.3	42.3	45.3	60.3	75.4	90.4	1.50
5.0	27.50				28.5	30.9	33.3	35.7	38.1	40.5	52.5	64.5	76.5	1.20
5.5	30.25						31.6	33.5	35.5	37.5	47.3	57.1	66.9	0.98
6.0	30.75								33.9	35.5	43.7	51.9	60.1	0.81

Table 11: BARLEY & SORGHUM — Repose Angle 26° — 650kg per cubic metre — Bank Height 1 metre

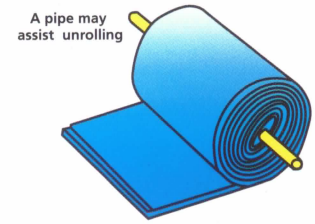
Grain Height (m)	Width (m)	Length 200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	Length per 50t
2.0	11.25	69.2	99.1	128.9	158.8	188.7	218.6	248.4	278.3	309.2	457.5	606.9	756.3	14.93
2.5	13.50	41.4	57.2	72.9	88.7	104.4	120.2	136.0	151.7	167.5	246.3	325.1	403.9	7.87
3.0	15.75	30.7	40.7	50.7	60.7	70.7	80.7	90.7	100.7	110.7	160.7	210.6	260.5	4.99
3.5	17.75	25.7	32.7	39.7	46.7	53.6	60.6	67.6	74.5	81.5	116.4	151.2	186.1	3.48
4.0	20.25	23.2	28.4	33.6	38.7	43.9	49.1	54.3	59.4	64.4	90.5	116.3	142.2	2.58
4.5	22.50		26.0	30.0	34.0	38.0	42.0	46.0	50.0	54.0	74.0	94.0	114.0	1.99
5.0	24.75			28.0	31.2	34.4	37.6	40.7	43.9	47.1	63.1	79.0	95.0	1.59
5.5	27.25				29.0	32.1	34.7	37.3	39.9	42.5	55.5	68.6	81.6	1.30
6.0	29.50					30.6	32.8	35.0	37.2	39.3	50.2	61.1	72.0	1.09

Table 12: OATS — Repose Angle 30° — 400kg per cubic metre — Bank Height 1 metre

Grain Height (m)	Width (m)	Length 200t	300t	400t	500t	600t	700t	800t	900t	1000t	1500t	2000t	2500t	Length per 50t
2.0	10.00	128.0	187.5	247.1	306.7	366.3	425.9	485.4	545.0	604.6	902.5	1200.4	1498.3	29.79
2.5	12.00	70.9	101.8	132.7	163.6	194.5	225.4	256.3	287.1	319.0	472.5	626.9	781.4	15.44
3.0	14.00	48.8	68.2	87.7	107.1	126.6	146.0	165.5	184.9	204.4	301.6	398.8	496.1	9.72
3.5	16.00	37.9	51.4	64.9	78.5	92.0	105.5	119.0	132.6	146.1	213.7	281.3	349.9	6.76
4.0	18.00	31.8	41.9	51.9	61.9	71.9	81.9	91.9	101.9	111.9	161.9	212.0	262.0	5.00
4.5	20.00	28.3	36.1	43.8	51.5	59.2	67.0	74.7	82.4	90.2	128.8	167.5	206.1	3.86
5.0	22.00	26.2	32.4	38.6	44.7	50.9	57.1	63.2	69.4	75.5	106.4	137.2	168.0	3.08
5.5	24.00	25.1	30.1	35.1	40.2	45.2	50.2	55.3	60.3	65.3	90.5	115.7	140.9	2.51
6.0	26.00		28.7	32.9	37.1	41.2	45.4	49.6	53.8	58.0	79.0	99.9	120.9	2.09



When ordering, be sure to specify that assembled covers be rolled in a 'concertina' fashion, as shown in diagram 4.



Lining the Bunker

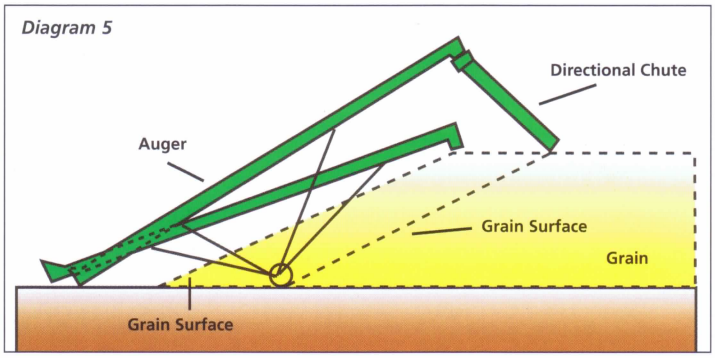
A waterproof lining laid across the floor and the walls of a bunker prevents moisture entering the grain from below as well as avoiding grain being contaminated by soil. In addition, the completed bunker can be effectively sealed once the top cover is in place and permit fumigation of the entire storage for effective insect control.

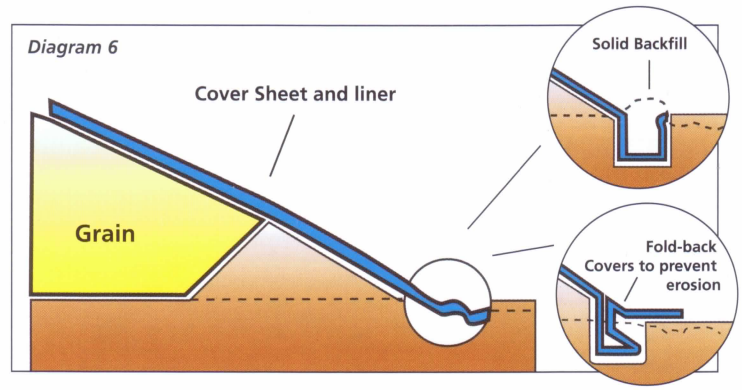
A large prefabricated lining sheet similar to the top cover can be used as a liner. Synthesis recommends Versatex™ and 9PP fabric, its main advantage being speed of application in addition to greater security and complete removal of uncontaminated grain when emptying. Alternatively, lining can be laid across the bunker and sealed with tape. Additional widths are progressively laid as the bunker is filled and are lapped 150 mm over the previous width. Tape each overlay to prevent grain from pushing laps up and to prevent insect migration. Allow about 1 metre of sheeting to extend beyond the walls to be sealed later with the cover sheet.

Filling the Bunker

Grain should not be stored at greater than 12 per cent moisture content otherwise losses are likely to occur.

Bunkers are simply filled by dumping grain from a truck into an auger (or grain thrower) located midway between the side walls. As the bunker fills, the auger is progressively moved towards the open end, taking care not to tear the ground sheet. The grain peak should be a uniform height along its full length and correct height to suit the distance between your walls (refer to tables 1-6).





A directional chute attached to the outlet or an auger can be a valuable aid when filling the bunker. It directs the grain further away from the outlet and allows a greater height to be reached before burying the undercarriage, as shown in diagram 5. Chains attached to the auger undercarriage provide a convenient means of pulling the auger from the grain stack, using a truck or a tractor.

Hand trimming of the stack before covering may be necessary to avoid depressions in the grain mass or along the top of the wall where rainfall may otherwise collect.

Fitting the Cover

On-site management is necessary for successful storage. The bulk storage cover will provide several seasons of use with positive care and attention.

Avoid driving on cover during filling. Avoid objects with sharp projections which may damage the cover.

The bunker does not have to be completely full before starting to cover grain. The cover is fitted by hand with a team dragging the concertina fabric from the filled end lengthwise.

Apply the cover as filling progresses to avoid possible damage by sudden storms. Do not attempt to handle large areas of cover sheet during windy conditions as it will quickly become unmanageable.

The cover is tensioned over the banks of the bunker to protect them from erosion by water, and the end and edges are finally sealed. The need to restrict wind flap (often created from the bubble of air caught under the cover) can be controlled by tyres or earth filled bags strategically placed along the length of the bunker – wear patches are recommended under the tyres or bags to prevent scuffing.

While Synthesis guarantees Canvacon and Landmark products for 3 years against premature breakdown from the effects of UV, there is no warranty (from Synthesis, the fabricator or the supplier) against failure from the effects of wind flap or mechanical damage.

Sealing

Bunker covers must be effectively sealed around the walls and ends of the bunker in order to:

- anchor the top cover to prevent wind lift
- prevent water and insects from entering
- allow fumigation if required
- protect earthen banks from erosion by water

Several methods for achieving a good seal are available. One of the simplest and more successful in practice requires both top and bottom covers to extend about 1 metre beyond the base of the walls. These edges are buried in a previously dug trench about 300 - 400 mm deep at the base of the wall as shown in diagram 6.

It is advisable to provide a fence, perhaps a temporary electric fence, around the bunker if there is any likelihood of animals foraging near the bunker. A well constructed and effectively sealed bunker can also be fumigated to control grain insects.

Removing the Grain

A mobile auger fitted with a cross sweep is ideal for unloading a bunker. Observe all safety procedures when using such equipment, especially if a robust woven coated ground sheet is in use. Shovels and brooms complete the job. Pneumatic grain conveyors are also effective in unloading this type of storage and front-end-loaders could be used. Ensure that covers still on the stack during unloading are held down against the wind. A bunker can be resealed after partial unloading.

The cover is progressively removed and folded in the reverse manner to which it was fitted. Flaking it back on itself effectively assists to reseal the bunker, if required. It also minimises the possibility of wind or mechanical damage. This also greatly assists with retrieval and storage.

Experience has shown that proper care and attention when the cover is not in use does extend the life of your covers.

- Covers should be swept or cleaned of any grain or dirt.
- Storage in a vermin proof shed or old shipping container eliminates rodent damage and also reduces the exposure to UV.
- Minor holes and tears can be patched by applying a suitable double-sided butyl tape to the effected area with a Landmark/Canvacon patch adhered on top. Always discuss with your fabricator.

NOTE: At all times care must be taken not to damage the cover. While reinforced fabrics are much more robust than plastic film, they can be damaged by sharp objects, abrasion, some chemicals etc. Avoid all contamination of fabrics from herbicides, fuel, oil and other chemicals, as these can attack the UV stabilisers in the fabric, reduce the life of the cover and negate the warranty. Specifications for Landmark, Canvacon, Versatex and 9PP are also available.

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For full technical specifications, please refer to the Product Profile

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