SHIRE OF
DOWERIN
TIN DOG TERRITORY

PUBLIC COMMENT – DEVELOPMENT APPLICATION

CATTLE FEEDLOT FOR AVON LOCATION 7566 BERRING EAST ROAD, GOOMALLING

An application has been received by the Shire of Dowerin from Ucarty Pty Ltd seeking Development Approval for an extension to their existing Ucarty feedlot site with a covered pen area allowing for a capacity of 2,000 head. The feedlot currently operates a traditional 1,500 head cattle feedlot across 14 pens at Ucarty Road, Ucarty.

The extension, combined with the current feedlot, will allow for the capacity of up to 4,000 head of cattle.

The Shire of Dowerin is seeking public comment on the proposal. Details of the application and plans are available on the Shire's website.

The Shire of Dowerin will consider all comments received by 24 March 2021 before proceeding further on this issue and presenting to Council for consideration.

We encourage you to discuss any aspect of this proposal with the Shire of Dowerin contacts;

- Environmental Health Officer, Kylie Neaves on emailkylie@yahoo.com.au or 0436 440 332
- Building Officer, Rebecca Creighan on rebecca@cfbuildingapprovals.com.au or 0414 554 758
- Manager Works & Assets, Les Vidovich on lvidovich@dowerin.wa.gov.au or 0429 311 160

Comments are to be in writing and can be submitted to the Chief Executive Officer, Shire of Dowerin, PO Box 111, Dowerin WA 6461 or emailed to vgreen@dowerin.wa.gov.au.

Submissions must be received by no later than Wednesday 24 March 2021.

Rebecca McCall
CHIEF EXECUTIVE OFFICER

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SHIRE OF DOWERIN
TIN DOG TERRITORY

SHIRE OF DOWERIN
13 Cottrell Street, Dowerin WA 6461
Tel: 9631 1202 Fax: 9631 1193

APPLICATION FOR DEVELOPMENT APPROVAL

Owner Details		
Name: Todd Quartermaine		ABN (if applicable): 24893190189
Address: 84 Ucarty Rock Road, Ucarty WA		Postcode: 6462
Phone: (work): (home): (mobile):	Fax:	E-mail:
Contact person for correspondence: Todd Quartermaine		
Signature:	Date:	
Signature:	Date:	
The signature of the owner(s) is required on all applications. This application will not proceed without that signature. For the purposes of signing this application an owner includes the persons referred to in the Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2 clause 62(2)		

Applicant Details (if different from owner)		
Name: As above		
Address:		Postcode:
Phone: (work): (home): (mobile):	Fax:	E-mail:
Contact person for correspondence:		
The information and plans provided with this application may be made available by the local government for viewing in connection with the application. ☑ Yes ☐ No		
Signature:	Date:	

Property Details		
Lot No: 4666	House/Street No: Nil	Location No:
Diagram or Plan No: 113035	Certificate of Title Vol. No: 49	Folio: 345A
Title encumbrances (e.g. easements, restrictive covenants): Nil		
Street name: Ucarty Road	Suburb: Ucarty	
Nearest street intersection: Ucarty Rock Road		

Proposed Development

Nature of development: (Please attach if insufficient space)
Existing cattle feedlot with planning approval for 1500 head. Expansion to include the construction of a shed to cover 8 additional pens. Total capacity post-construction to be 4000 head.

Is an exemption from development claimed for part of the development? ☐ Yes ☑ No

If yes, is the exemption for the following:
N/A

Description of proposed works and/or land use: (Please attach if insufficient space)
Construction of a shed (240 x 30M) - roof only, no walls.
Construction of 8 new feedlot pens, each to have a compacted clay/gravel base.
Installation of 2 new tanks to hold freshwater collected from roof.
Please see supporting Development Application document.

Description of exemption claimed (if relevant): (Please attach if insufficient space)
N/A

Nature of any existing buildings and/or land use: (Please attach if insufficient space)
There are existing sheds in close proximity to the feedlot.
Current land use is agriculture.

Approximate cost of proposed development: $640,000

Estimated time of completion: Early April 2021

OFFICE USE ONLY

Acceptance Officer's initials: Date received:

Local government reference no:

DEVELOPMENT APPLICATION – UCARTY FEEDLOT, UCARTY

1. INTRODUCTION

The Quartermaine family currently operate a traditional 1500 head cattle feedlot across 14 pens at Ucarty Road, Ucarty. The property is 3600 hectares in size (with an additional 3800 hectare property owned and operated by the Quartermaine family). The property is in the Shire of Dowerin and the feedlot site is located approximately 15 km ESE from Goomalling, 20 km SSW of Dowerin and 35km WSW of Wyalkatchem. The existing feedlot received planning approval for 1500 head on the 29 January 2015 from the Shire of Dowerin (ADM 0337 DJA 01/15).

This is an application for a Development Application to construct covered feedlot pens at the existing Ucarty Feedlot site, with the covered pen area to have a capacity of 2000 head. Construction will include the formation of a compacted hardstand, feedlot infrastructure (fences, water troughs, feed bunks etc), freshwater capture infrastructure (pipes, tanks) and the shed. Once constructed, this will take the capacity of the feedlot to 4000 head.

The feedlot is located in a low risk environment with an average rainfall of only 349mm, existing bores in close proximity of the feedlot at a depth of 20m, very limited surface water in the vicinity of the feedlot and the closest neighbour a distance of 3.5 km from the feedlot. The existing feedlot has operated since 2006 with no complaints received in that time.

2. THE ENVIRONMENT

A description of the existing environment of Ucarty Road, Ucarty, is provided below.

A. Location

The feedlot is located at Ucarty Road, Ucarty. The property is in the Shire of Dowerin and the feedlot site is located approximately 15 km ESE from Goomalling, 20 km SSW of Dowerin and 35km WSW of Wyalkatchem. The land is located in the Shire of Dowerin and is zoned Rural under the Shire of Dowerin Local Planning Scheme No 2. The surrounding land use is agriculture.

B. Climate

The climatic conditions for the Ucarty region are shown in Table 1 and Figure 1. The information presented in Table 1 has been calculated from 50 years of daily SILO data for a location approximately 3km from the feedlot. The date range for the data is January 1970 to December 2019. Mean rainfall versus Mean evaporation is shown in Figure 1. The prevailing winds for that region is easterly/north-easterly at 9am (for Goomalling and Wyalkatchem) and a westerly at 3pm (for Wyalkatchem) (Source: Bureau of Meteorology).

Table 1: Key climate data for Ucarty.

Descriptor	Value	Source
Average annual rainfall	349 mm	SILO
Mean winter rainfall	251 mm	SILO
1 in 20 year winter* rainfall	355 mm	SILO
Average winter* evaporation**	583 mm	SILO
Annual evaporation**	2102 mm/year	SILO

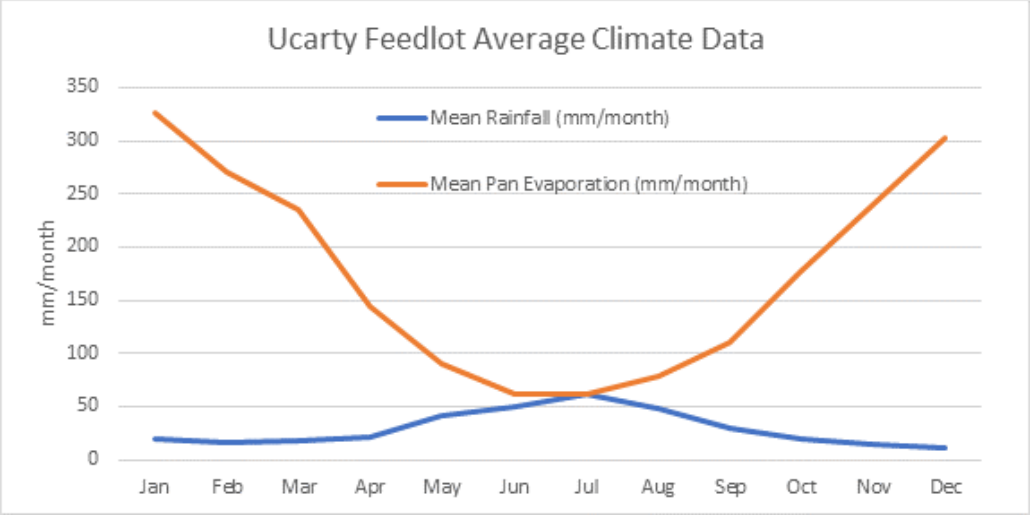


Figure 1: Mean rainfall versus mean pan evaporation for Ucarty.

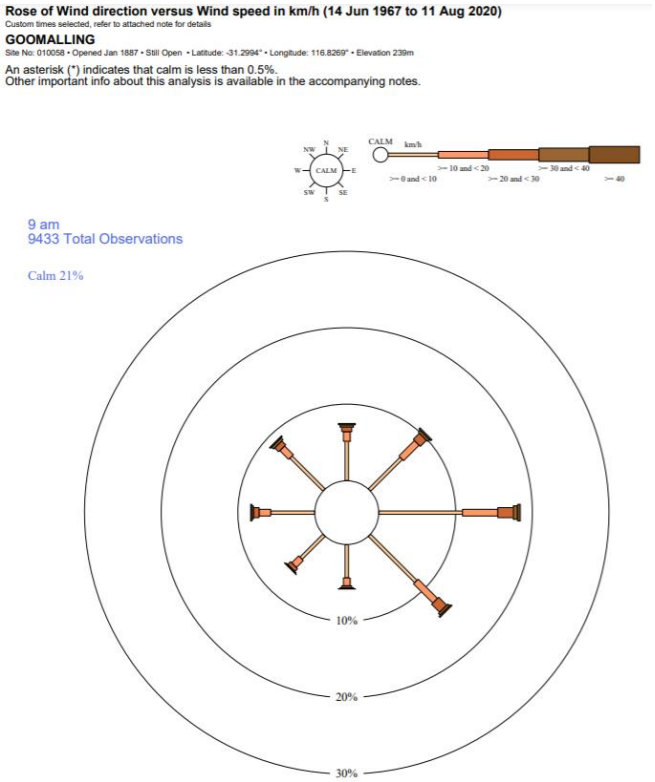


Figure 2: Prevailing winds for Goomalling (15km WNW of the feedlot site) at 9am.

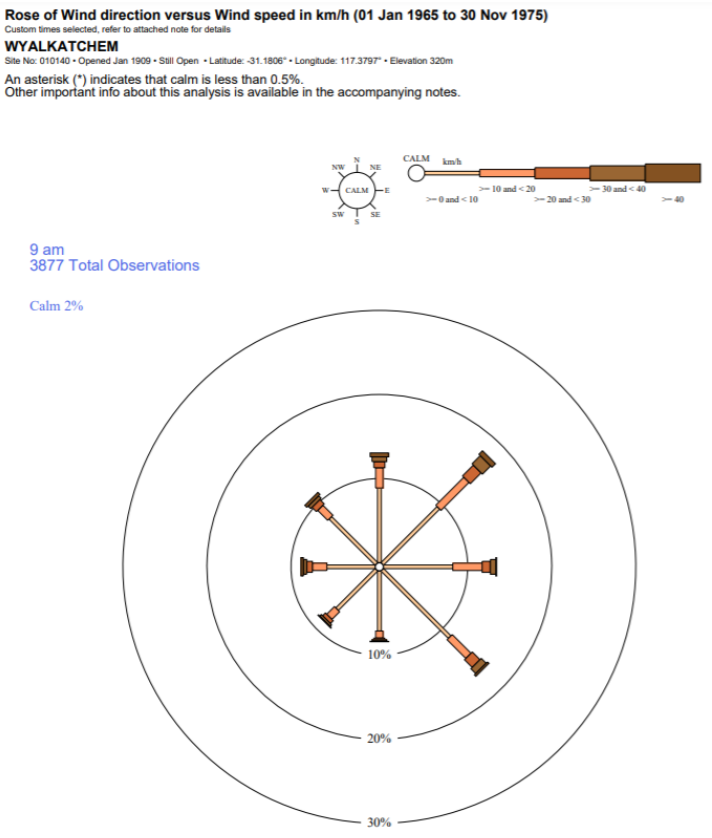


Figure 3: Prevailing winds for Wyalkatchem (35km ENE of the feedlot site) at 9am.

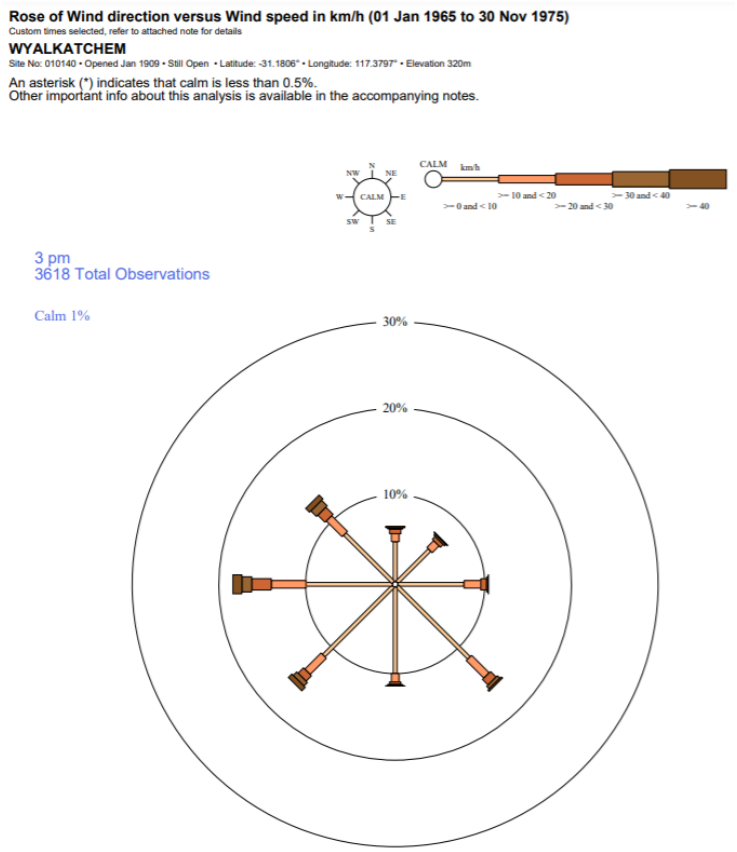


Figure 4: Prevailing winds for Wyalkatchem (35km ENE of the feedlot site) at 3pm.

C. Geology and soils

The soil subsystem at the site is predominantly 256PsCU, which is characterised by yellow Aeolian sand with patches of white sand and some areas of sand over gravel. The landscape is dominated by gentle slopes with some areas of well drained flats and footslopes.

D. Surface water

The premises is not located in a flood prone area and is above the 1 in 100 year average recurrence interval flood height. The premises is also not located in a Public Drinking Water Source Area, but is in a proclaimed surface water area (SwanAvon_Mortlock catchment).

The closest surface water body is a salt lake that is located 300m SE of the feedlot. This salt lake only contains water during winter months.

E. Groundwater

The property is not in a proclaimed groundwater area. The Quartermaine's access three bores that are located within close proximity of the feedlot (see Figure 5). All 3 bores show a groundwater level of 20m (Table 2).

Table 2: Bore data for Ucarty Feedlot.

Bore	Distance and Direction from feedlot	Depth	Capacity
Bore 1	400m SW	20m	30,000 L/10 hours
Bore 2	1600m SW	20m	60,000 L/10 hours
Bore 3	500m E	20m	50,000 L/10 hours

Figure 5: Google Earth image showing location of the 3 bores in close proximity to the feedlot.

Information obtained from the Water Information Reporting tool is outdated and all bores are located >4.5 km from the feedlot (Figure 6). Nonetheless the data is presented below. Groundwater depths in the middle of winter ranged from 1.4 to 2.3 m among four of the closest (< 5.4 km) bores to the location. Table 3 shows the last known groundwater levels and the most recent groundwater salinity data.

Table 3: Groundwater water data from the Water Information Reporting tool for Ucarty.

Site Ref	Collect Date	Lat	Long	Distance to Bore (km)	Bearing to Bore	Depth Drilled (mbGL)	Static water level (m)	TD Solids (mg/L)
61510989	30/06/1974	-31.3246	116.9777	4.5	N	2	1.8	5600
61510982	30/06/1930	-31.3526	116.926	5	W	7	2.3	5400
61510978	1/01/1900	-31.35	116.9252	5.2	W	5.3	2.2	300
61510976	1/01/1900	-31.3374	116.9304	5.4	NW	1.9	1.4	5000
61510988	1/01/1900	-31.3169	116.9985	5.7	NE	2	0	375
61510983	30/06/1978	-31.3505	116.9181	5.8	W	16.6	8	360
61510984	30/06/1977	-31.3494	116.9174	5.9	W	15	8.2	390
61510981	30/06/1920	-31.3531	116.9157	6	W	4.4	1.7	690
61510985	30/06/1974	-31.348	116.9154	6.2	W	13.72	13.41	310
61510987	30/06/1979	-31.3473	116.9145	6.3	W	27.43	18.29	4000
61510986	30/06/1920	-31.3523	116.9087	6.6	W	2.6	0	3600

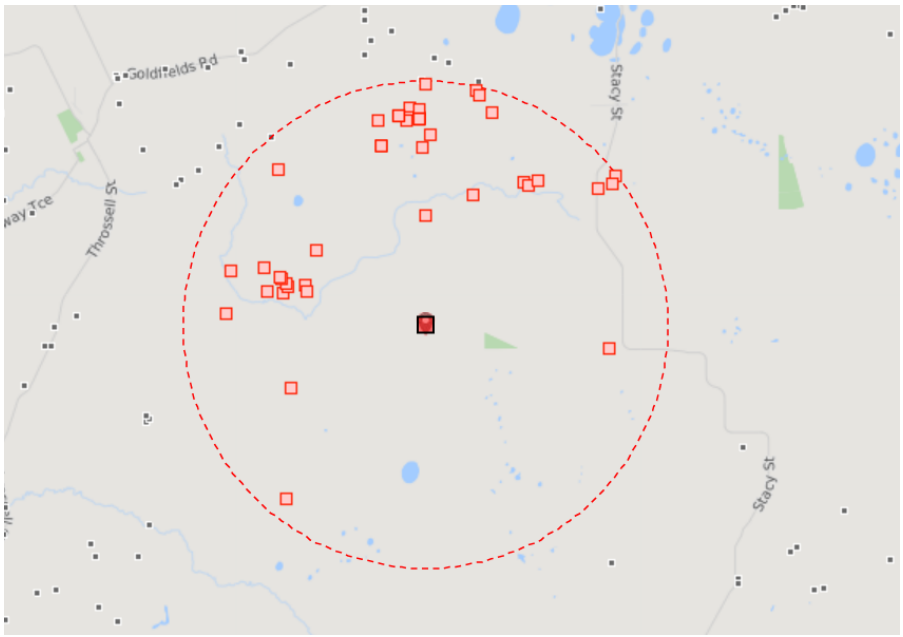


Figure 6 – Water Information Reporting screenshot showing locations of bores to feedlot. Circle radius of 10 km.

3. DESCRIPTION OF THE PROPOSED FEEDLOT DESIGN AND OPERATIONS

A. Washdown of equipment and vehicles

There will be no washdown of equipment or machinery at the feedlot facility.

B. Storage of fuels and chemicals

There are no fuels or chemicals stored at the feedlot facility.

C. Pens and shed design

The following describes the design of the new 8 pens that are to be constructed:

- Pens to each measure 30m x 30m (area of 900m^2/pen).
- Shed to measure 240m x 30m and contain 8 pens (total pen area of 7200m^2).
- Average weight of cattle in pens will be 420 kg.
- Each pen to have a maximum capacity of 250 head (193 SCU). Total capacity to be 2000 head (1540 SCU). Refer to Table X.
- Stocking rate of 3.6 m^2/head (4.7 m^2/SCU). The National Feedlot Accreditation Scheme Standards (September 2018) states that a minimum stocking density of 2.5 m^2/SCU is provided for shedded cattle, so therefore the stocking rate of this facility is more than acceptable.
- Cattle will be on feed for approximately 90 days, allowing for approximately 4 rotations per year.
- Pen floor to have a slope of 1% E-W and 0.5% N-S (shed to have a N-S orientation).
- The pen floor is to be constructed of 300m of clay (with some gravel), using a vibrating roller and a water truck for water binding.
- The existing feedlot infrastructure includes a set of cattle yards, therefore there will not be the need for the construction of additional cattle yards.
- The shed design is shown in the Appendices.

Table 4: Head to SCU comparison for the 8 new pens to be constructed at Ucarty Feedlot.

	Head	SCU
Stocking density	3.6 m^2	4.7 m^2
Number per pen	250 head	193 SCU
Total number	2000 head	1540 SCU

D. Liquid waste management

Liquid waste in a feedlot is created primarily through the action of rain falling onto the pens. When rain is removed from the system, the generation of liquid waste becomes negligible. The construction of the shed over these 8 pens will therefore negate the need for drains and ponds to capture and contain wastewater. This system operates almost identically to a deep litter piggery, whereby there is negligible liquid waste and solid waste is absorbed by straw that is added to the pens for bedding.

E. Solid waste management

MANURE

Manure is a natural by-product from a cattle feedlot and is a valuable commodity in the farming system. In this case, the by-product will be a straw/manure combination as straw is added to the pens as bedding for the cattle. Three bales of straw will be added to each pen before the cattle enter the feedlot, with an additional 2 bales of straw added to each pen each week (for approximately 12 weeks). Pens are then cleaned after 6-8 weeks and then again at the completion of the 12 weeks, with the straw/manure product being immediately applied to paddocks at the point of removal (no stockpiling).

MORTALITIES

Dead animals are immediately removed from the pen using a front end loader. The dead animal is taken to a designated area for composting. This designated area is an existing clay lined pit within close proximity of the feedlot. The animal is placed on at least 1m of compost and then covered with 2-3 m of compost product. The compost piles are never turned so the bodies can break down undisturbed. Once the animals are decomposed, the compost product is applied to paddocks. The mortality rate of the feedlot is expected to be 0.5%, therefore approximately 80 animals for the 4000 head feedlot working on 4 rotations per year.

Manure and compost are not applied within 25m of any watercourses, drainage lines and the property boundary.

NUTRIENT BALANCE

The following nutrient balance shows how nutrients generated by a beef cattle feedlot are removed with cropping. Cattle manure, carcass compost and pen bedding material generated by the 4000 head feedlot can be spread over 5,500 ha of land. A cropping regime consisting of Grain Wheat, Grain Oats, Canola, Winter Cereal hay and Lupins is available to remove nutrients from the cropping area, however only 2,500 ha of Grain Wheat is required to remove nutrients generated by the feedlot.

Some decomposition of the straw bedding material in the pens will take place but has not been accounted for. Therefore, effective Nitrogen loading onto the cropping area will be slightly less than shown in this balance.

Nutrients IN

Manure

The SCU capacity for the feedlot can be calculated by finding the SCU scaling factor (MLA, 2012) for an average liveweight of 420kg and multiplying by the total head of cattle.

$$SCU = 0.77\ [SCU\ scaling\ factor] \times 4000\ \left[\frac{head}{year}\right] = 3{,}080\ \left[\frac{SCU}{year}\right]$$

Manure solids generated from a 3,080 SCU feedlot were calculated using a total solids generation rate of 410 kg TS/SCU/year (R. Tucker, 2015).

$$Manure\ Dry\ solids = 3{,}080\ [SCU] \times 410\ \left[\frac{kg\ TS}{SCU \times year}\right] = 1{,}262{,}800\ \left[\frac{kg\ TS}{year}\right]$$

Bedding Material

Straw will be used for bedding in the pens, with 3 pales put down initially, followed by 2 bales each following week. A total of 8 pens will receive 26 bales of straw on each pen rotation, totalling 4 rotations each year. Each bale of straw weighs 400 kg and has a dry-matter content of 90%. Total dry matter of straw per year can be calculated as follows:

$$Straw\ Solids = 26\ \left[\frac{bales}{pen}\right] \times 8\ [pens] \times 4\ \left[\frac{rotations}{year}\right] \times 400\ \left[\frac{kg}{bale}\right] \times 0.9\ \left[\frac{kg\ solids}{kg\ straw}\right]$$
$$= 299{,}520\ \left[\frac{kg\ TS}{year}\right]$$

Straw dry-matter nutrient content is expected to be 0.6% Nitrogen, 0.05% Phosphorous and 1.4% Potassium

(APL, 2018).

Carcass Compost

A 0.5 % mortality rate is assumed for the 4000 head feedlot, with carcasses composted and spread over the cropping area.

Total carcass compost produced was calculated using a 72% cattle carcass moisture content (D. A. Gredell, 2018), a 20 carcass/year production and 420 kg average live weight. An assumed 35% solids loss through the composting process was used (MLA, 2015).

$$Carcass\ Compost\ Produced = 20\ \left[\frac{head}{year}\right] \times 420\ \left[\frac{kg\ liveweight}{head}\right] \times 28\ \% \left[\frac{kg\ dry\ solids}{kg\ liveweight}\right] \times 65\ \%$$
$$= 1{,}492\ \left[\frac{kg\ dry\ solids}{year}\right]$$

Sum of all nutrient sources

Table 5 uses the total solids generated and their nutrient composition (MLA, 2015) to sum the total Nitrogen, Phosphorous and Potassium generated by both nutrient sources at the feedlot.

$$Nutrients\ IN\ \left[\frac{kg}{year}\right] = Dry\ solids\ generated\ \left[\frac{kg}{year}\right] \times Nutrient\ Composition\ [\%\ dry\ weight]$$

Table 5 - Total waste and nutrient output for land spreading.

Nutrient Source	Manure	Bedding Material	Carcass compost	
Dry solids generated (kg/year)	1,262,800	299,520	1,492	
Nutrient composition				
N (% db)	2.50%	0.60%	2.10%	

P (% db)	1.00%	0.05%	0.80%	
K (% db)	1.90%	1.40%	1.50%	
Nutrients IN				**Total**
N (kg/year)	31,570	1797	31	**33,398**
P (kg/year)	12,628	150	12	**12,790**
K (kg/year)	23,993	4193	22	**28,209**

Worked Example - Phosphorous:

Manure dry solids production is 1,262,800 [kg TS/year] with a Phosphorous content of 1.0%.

Bedding material dry solids production is 299,520 [kg TS/year] with a Phosphorous content of 0.05%.

Carcass compost dry solids production is 1,492 [kg TS/year] with a Phosphorous content of 0.8%.

$$Nutrient\ IN\ (P) = \left(1{,}262{,}800\ \times \frac{1.0}{100}\right) + \left(299{,}520\ \times \frac{0.05}{100}\right) + \left(1{,}492\ \times \frac{0.8}{100}\right) = 12{,}790\ \frac{kg\ (P)}{year}$$

Nutrients OUT

A cropping regime consisting of 5 different crops and cropping areas will be used to remove the nutrients. The expected nutrient offtake of a crop can be calculated by knowing the dry matter composition of a crop (APL, 2018) and the expected yield. Summary of crop types, expected yields and their nutrient offtake is shown in Table 6 below.

$$Crop\ requirement\ (CR)\left[\frac{kg}{ha.year}\right] = Dry\ Matter\ Nutrient\ Content\ [\frac{kg}{t}]\ x\ Crop\ Yield\ [\frac{t}{ha.year}]$$

Table 6 – Nutrient removal table for cropping regime.

Crop Type	Grain Wheat	Canola	Grain oats	Winter cereal hay	Lupins
Crop Yield (t/ha)	2.5	1	2	4	1.7
Crop Area (ha)	3000	600	300	600	1000
Area Percentage	55%	11%	5%	11%	18%
CR-N (kg/ha/Year)	47.5	33	30	80	76.5
CR-P (kg/ha/Year)	10	0.3	6	12	5.1
CR-K (kg/ha/Year)	12.5	12	8	64	13.6

Worked Example - Phosphorous:

Expected yield for Grain Wheat is 2.5 t/ha, with a dry matter Phosphorous content of 4 kg/ton.

$$Crop\ Requirement\ (P)\ =\ 2.5\ \times 4 = 10\ \frac{kg\ (P)}{ha.year}$$

Nutrient Balance

Of the 5,500 ha of land available for spreading, only 2,500 ha of Grain Wheat is required. Total nutrient loading onto the 2,500 ha of available land is calculated as follows, with totals shown in Table 3:

Using the total Nutrients IN from Table 5, the Nutrient Loading can be calculated across the cropping area:

$$Nutrient\ Loading\ \left[\frac{kg}{ha\ year}\right] = \text{Nutrient IN}\ \left[\frac{\text{kg}}{\text{year}}\right]\ \div\ 2{,}500\ [ha]$$

Comparative difference between nutrient loading and crop requirement can be shown by this equation, and it shows the effective safety factor for each nutrient:

$$Difference\ [\%] = \frac{\text{Crop Requirement} - \text{Nutrient Loading}}{\text{Crop Requirement}} \times 100$$

The percent difference is how much nutrient cropping is removing from the soil, compared to how much is being put on. With 100% meaning that no nutrient is applied to meet the crop requirement, and 0% meaning that all of the applied nutrient is being taken up by the crop.

Table 7 – Nutrient balance indicating that all nutrients spread onto the land will be removed by the cropping regime.

	Nutrient Loading [kg/ha/year]	Crop Requirement [kg/ha/year]	Difference (%)
Nitrogen	13.4	47.5	72%
Phosphorous	5.1	10.0	49%
Potassium	11.3	12.5	10%

Therefore, spreading of feedlot waste gives a 72%, 49% and 10% safety net for Nitrogen, Phosphorous and Potassium. Considering that Potassium is the nutrient most in-excess, the proposed cropping regime can remove an extra 10% Potassium than the feedlot can produce at maximum capacity.

Due to the low levels of nitrogen input to the land in comparison to crop requirement, volatilisation during spreading was not considered.

Combined Worked Example - Phosphorous:

Manure dry solids production is 1,262,800 [kg TS/year] with a Phosphorous content of 1.0%.

Bedding material dry solids production is 299,520 [kg TS/year] with a Phosphorous content of 0.05%.

Carcass compost dry solids production is 1,492 [kg TS/year] with a Phosphorous content of 0.8%.

$$Nutrient\ IN\ (P) = \left(1{,}262{,}800\ \times \frac{1.0}{100}\right) + \left(299{,}520\ \times \frac{0.05}{100}\right) + \left(1{,}492\ \times \frac{0.8}{100}\right) = 12{,}790\ \frac{kg\ (P)}{year}$$

Using the above Nutrient IN total, the nutrient loading for phosphorous across 2,500 ha is:

$$Nutrient\ Loading\ (P) = \frac{12{,}790}{2{,}500} = 5.1\ \frac{kg\ (P)}{ha.year}$$

Expected yield for Grain Wheat is 2.5 t/ha, with a dry matter Phosphorous content of 4 kg/ton.

$$Crop\ Requirement\ (P)\ =\ 2.5\ \times 4 = 10\ \frac{kg\ (P)}{ha.year}$$

$$Difference\ [\%] = \frac{10 - 5.1}{10} \times 100 = 49\%$$

Percent difference between nutrient loading and crop offtake for Phosphorous is 49%, meaning that the nutrients spread onto the land will be completely removed by Grain Wheat, with a 49% safety margin.

Definitions Used

Term	Description	Unit
Nutrients IN	The sum of total nutrient generated by premise considered in the nutrient balance.	$\boldsymbol{\frac{kg}{year}}$
Nutrients OUT	The sum of total nutrient removed during nutrient management.	$\boldsymbol{\frac{kg}{year}}$
Nutrient Loading	The intended loading rate of nutrients for the cropping area.	$\boldsymbol{\frac{kg}{ha.year}}$
Crop Requirement	Nutrient offtake by cropping, considering crop nutrient content and expected yield.	$\boldsymbol{\frac{kg}{ha.year}}$

4. SEPARATION DISTANCES

The s-factor calculation (MLA, 2012) can be used to quantify the required separation distance between a feedlot and a sensitive receptor. This calculation has been designed for traditional outdoor feedlots, which means it will present very conservative numbers for this covered feedlot.

A. SINGLE RURAL DWELLING

$D = \sqrt{N} \times S$

where N = feedlot capacity in SCU = 3080 SCU

D = separation distance (m)

S = composite site factor = S1 X S2 X S3 X S4 X S5

S1 = design and management factor = 79 (<750mm rainfall, 3.6 m^2/SCU)

S2 = receptor factor = 0.3 (single farm or rural dwelling)

S3 = terrain factor = 1.0 (flat terrain)

S4 = vegetation factor = 1.0 (crops only, no effective tree cover)

S5 = wind direction factor = 1.0

S = S1 X S2 X S3 X S4 X S5 = 23.7

$D = \sqrt{3080} \times 23.7$

= 1,315 m

Therefore the minimum separation distance of the feedlot of 4000 head (3080 SCU) is 1,315m from the nearest single farm or rural dwelling. This is an extremely conservative figure when the covered nature of the feedlot is considered. The actual distance to the nearest single farm or rural dwelling is 3,500 m (refer to Map X in Section 8).

S-factor calculations for the single rural or farm dwellings located more than 3,500 m from the feedlot were deemed to be unwarranted.

B. MEDIUM TOWN (>500 – 2,000 PEOPLE)

$D = \sqrt{N} \times S$

where N = feedlot capacity in SCU = 3080 SCU

D = separation distance (m)

S = composite site factor = S1 X S2 X S3 X S4 X S5

S1 = design and management factor = 79 (<750mm rainfall, 3.6 m^2/SCU)

S2 = receptor factor = 1.2 (medium town >500-2,000 persons)

S3 = terrain factor = 1.0 (flat terrain)

S4 = vegetation factor = 1.0 (crops only, no effective tree cover)

S5 = wind direction factor = 1.0

S = S1 X S2 X S3 X S4 X S5 = 94.8

D = √3080 x 94.8

= 5,261 m

Therefore the minimum separation distance of the feedlot of 4000 head (3080 SCU) is 5,261 m from the nearest small town of Goomalling. The actual distance to Goomalling is approximately 15,000 m (refer to Map X in Section 8).

C. SUMMARY

The use of the s-factor equation in this circumstance is conceptually flawed as the calculation has been designed for use in traditional outdoor feedlots. There has been no allowance for the presence of the roof in the calculations above. In reality, the roof will greatly reduce odour generation from the facility. Nonetheless, the required separation distances that have been calculated using the s-factor equation are extremely conservative but are still able to be achieved at this site. In fact the actual separation distances far exceed the required separation distances for both single farm or rural dwellings and town sites (Table 8).

Table 8: Compliance of the nearest receptors with the s-factor calculation.

	Distance & Direction from the feedlot	Type of receptor	Compliance with s-factor
1.	3.9 km to the SE	Single farm or rural dwelling	Yes
2.	4.7 km to the E	Single farm or rural dwelling	Yes
3.	3.5 km to the NW	Single farm or rural dwelling	Yes
4.	4.7 km to the N	Single farm or rural dwelling	Yes
5.	6.7 km to the N	Single farm or rural dwelling	Yes
6.	Goomalling townsite to the WNW	Medium town (>500-2000 persons)	Yes

5. MAINTENANCE AND RECORDING

The maintenance program at the feedlot includes:

- Feedlot pens are scraped clean every 6-8 weeks, with the partially decomposed manure/straw product to be applied to paddocks at the point of removal. This pen cleaning frequency far exceeds that stated in the National Guidelines (a minimum of 13 weeks). No water is used in the cleaning of feedlot pens.
- Mortalities are removed from pens daily (as required) and transported to the designated onsite compost pad.
- A visual check of the pen surface and compost pad will be made weekly. Repairs to this infrastructure will be made as required. Any repairs to the feedlot infrastructure will be detailed in an excel spreadsheet and dated.
- Any odour complaints received by the applicant will be correlated with weather conditions and the operations at the feedlot at the time. A complaints register will be kept at the property that details the nature of the complaint, the response made and any mitigation measures implemented.

Ucarty feedlot has been accredited with the National Feedlot Accreditation Scheme (NFAS) since it has been operational. This Scheme independently audits cattle feedlots to ensure that they adhere to standards and legislation in relation to environment, animal welfare and food safety matters. In terms of environmental aspects, this Scheme audits against the National Code of Practice and National Guidelines. Under this scheme, this feedlot is audited annually with any non-compliance matters addressed immediately.

6. PLANNING CONSIDERATIONS

A. Access

Access to the property is via a combination of Nambling Road, Berring East Road, Sanders Road, Ucarty Rock Road and Ucarty Road.

B. Traffic loads

The above access roads are already utilised to service the existing 2000 head cattle feedlot at the site. Given that the capacity following the expansion will be 4000 head, this will equate to an approximate doubling of the traffic loads. Refer to Table X for a comparison of current versus expected truck numbers.

Table 9: Cattle, hay and grain loads to Ucarty Feedlot for the 2000 head and 4000 head feedlot.

	Current (2000 head)	Expected (4000 head)
Cattle (C train)	43 loads per year or 0.8 loads per week.	86 loads per year or 1.6 loads per week.
Hay (Pocket Road Train)	25 loads per year, notionally 6 loads per week in October.	50 loads per year, notionally 12 loads per week in October.
Grain (Pocket Road Train)	50 loads per year, notionally 4 loads per week in November, December and April.	100 loads per year, notionally 8 loads per week in November, December and April.

Therefore the expected traffic load once the new covered pens are constructed will be 1.6 loads per week for January to March and May to September; 13.6 loads per week for October; and 9.6 loads per week for November, December and April.

C. Water supply

Water for the feedlot is currently sourced from 3 bores located within 1.6km of the feedlot. The construction of a shed will allow for freshwater capture from the roof, which will reduce the reliance on groundwater. Two 375,000 litre tanks are to be used to hold freshwater collected from the roof, with a pipe system to then feed this water back into water troughs in the feedlot.

7. REFERENCES

APL. (2018). *National Environmental Guidelines for Indoor Piggeries (NEGIP).* Australian Pork Limited.

D. A. Gredell, T. G. (2018). Palatability and Biochemical Factors of Beef from Mature Cattely Finished on a Concentrate Diet Prior to Harvest. *Meat and Muscle Biology 2*, 111-126.

MLA. (2012). *National Beef Cattle Feedlot Environmental Code of Practice.* Meat & Livestock Australia.

R. Tucker, S. M. (2015). *Beef cattle feedlots: waste management and utilisation.* Meat and Livestock Australia.

8. APPENDICES

Appendix 1 – Shed design document attached to email

Appendix 2 – Feedlot layout map attached to email

Appendix 3 – Feedlot location showing distance to neighbours attached to email

24/09/2020

Todd Quartermaine
Ucarty Holdings
Ucarty Road
Ucarty , WA

Ref: 7354 / 3
240m x 30m x 6m Feed-lot cover

Job No: _____

WHEATBELT STEEL
BENCHMARKING QUALITY

A 98 Byfield St, Northam WA 6401
P 1800 800 909
F 1800 800 910
www.wheatbeltsteel.com.au

Dear Todd,

Thank you for giving us the opportunity to offer our recommendations for your project at DOWERIN.
The details of our recommendations are outlined in the following pages.

Site Location and Information

84 Ucarty Road, DOWERIN, WA, 6461

Region A1,Terrain 2,Importance Level 2

Shed Configuration and Dimensions

Configuration	Roof Only
Overall Dimensions (L x W x H)	240m x 30m x 5.9m
Bay Spacing	7.5m
Clearance Height	4.9m
Roof Pitch	*(Data missing; Please resubmit details)*

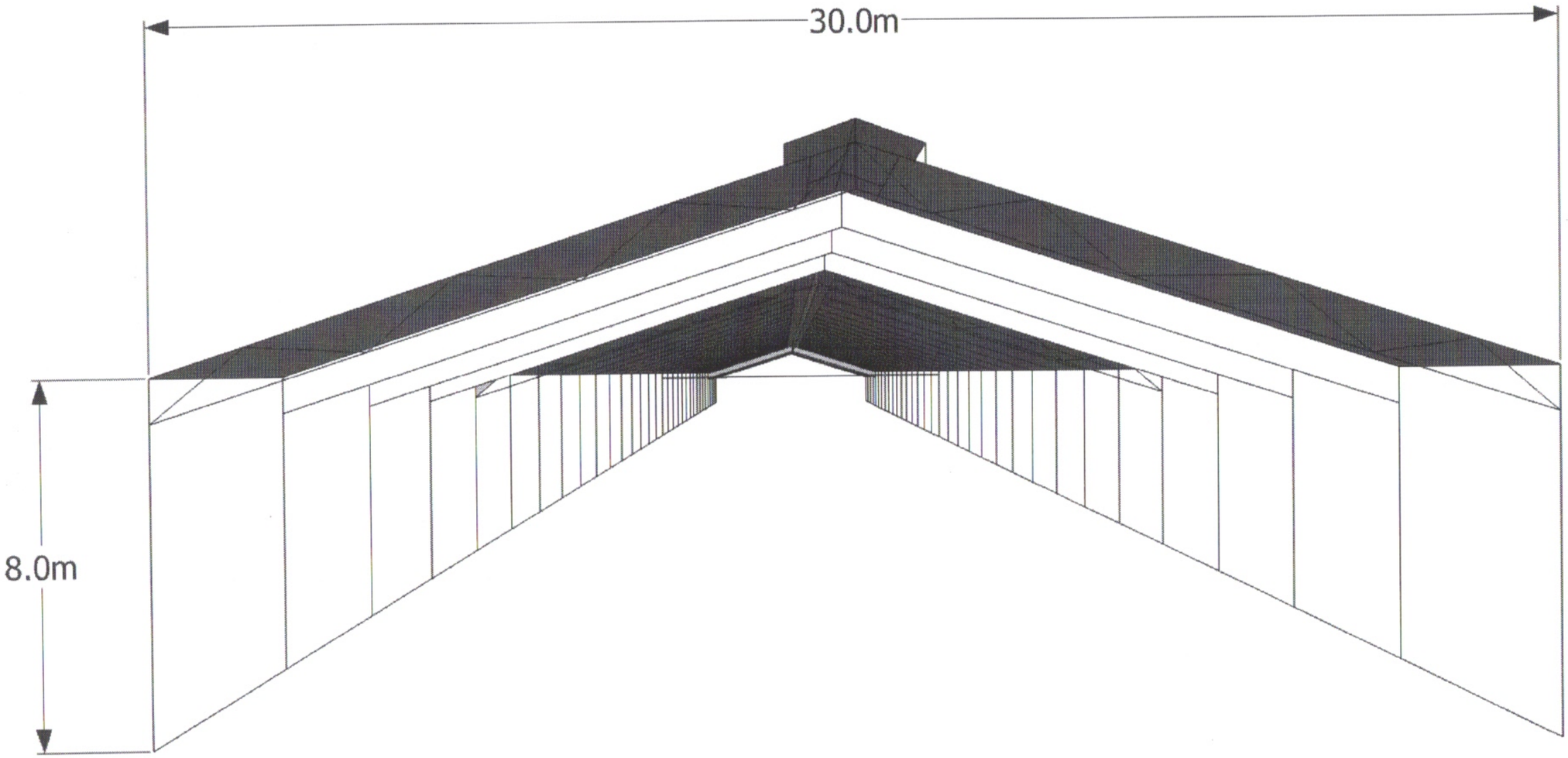
Construction

Column Construction	Universal Beam (RSJ)
Rafter Construction	Parallel Chord Web Truss
Steelwork Treatment	Hot Dip Galvanised
Paint Colour	Galvanised

Cladding, Gutters and Downpipes

Cladding Profile	Trimdek
Roof Cladding Finish	Zincalume
Wall Cladding Finish	Zincalume
Gutter Finish	Zincalume
Gutter Type	200mm Tapered to Both Ends
Downpipe Finish	PVC Stormwater Pipe

WE BUILD
IN STEEL



WBS GROUP

Client: Ucarty Holdings	Quote No:7354-3	View: Northern Elevation	Drawn: 24 September 2020

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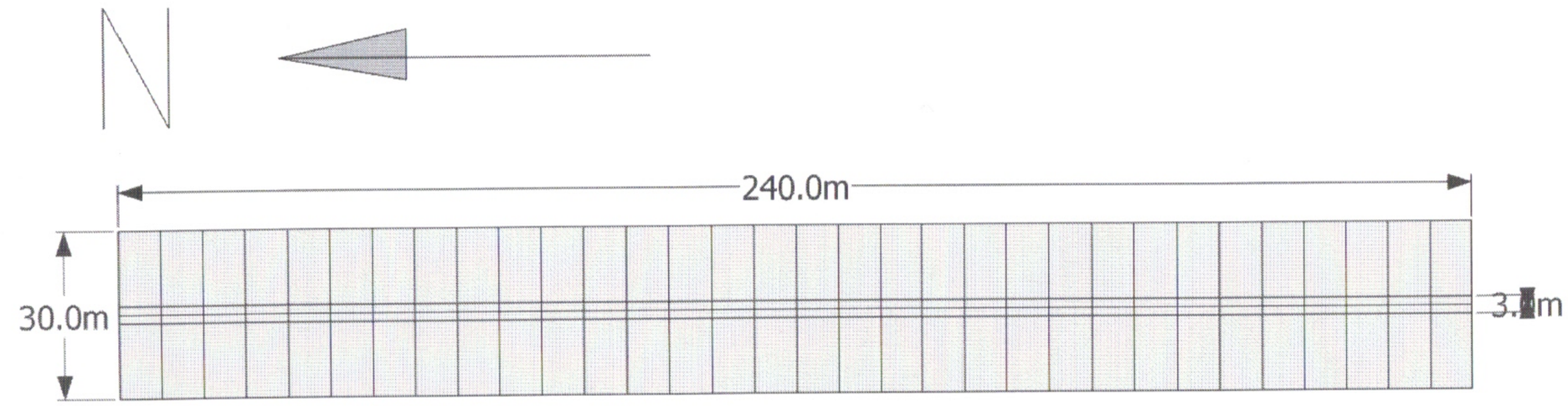
IN STEEL



WBS GROUP

Client: Ucarty Holdings	Quote No:7354-3	View: Plan View	Drawn: 24 September 2020

WE BUILD
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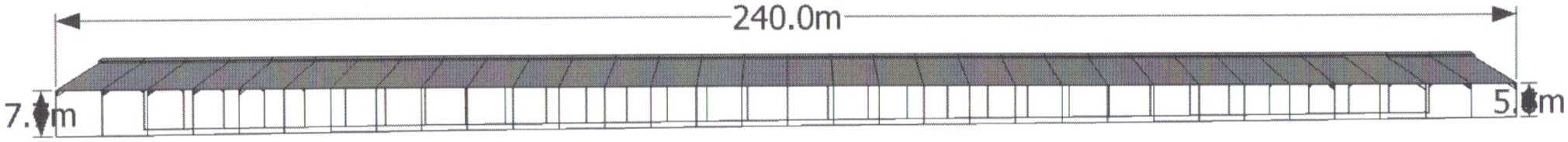

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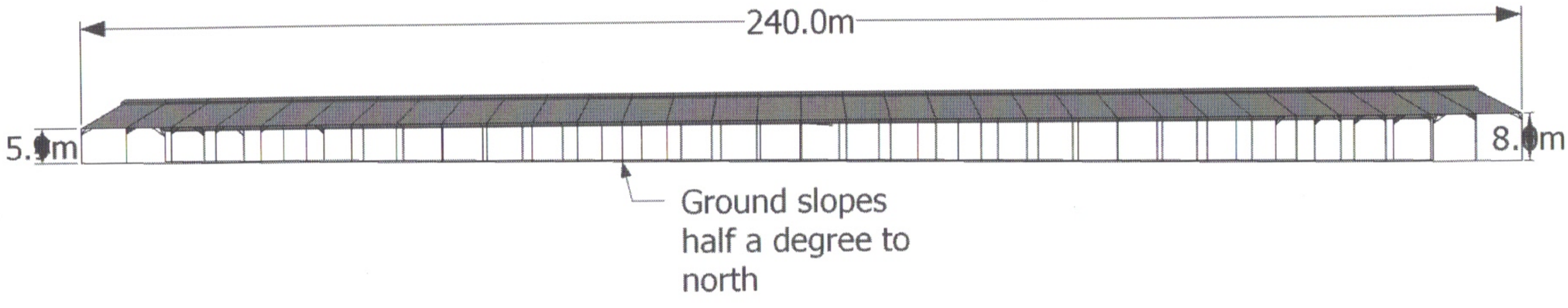

WBS GROUP

Client: Ucarty Holdings	Quote No:7354-3	View: Eastern Elevation	Drawn: 24 September 2020

WE BUILD
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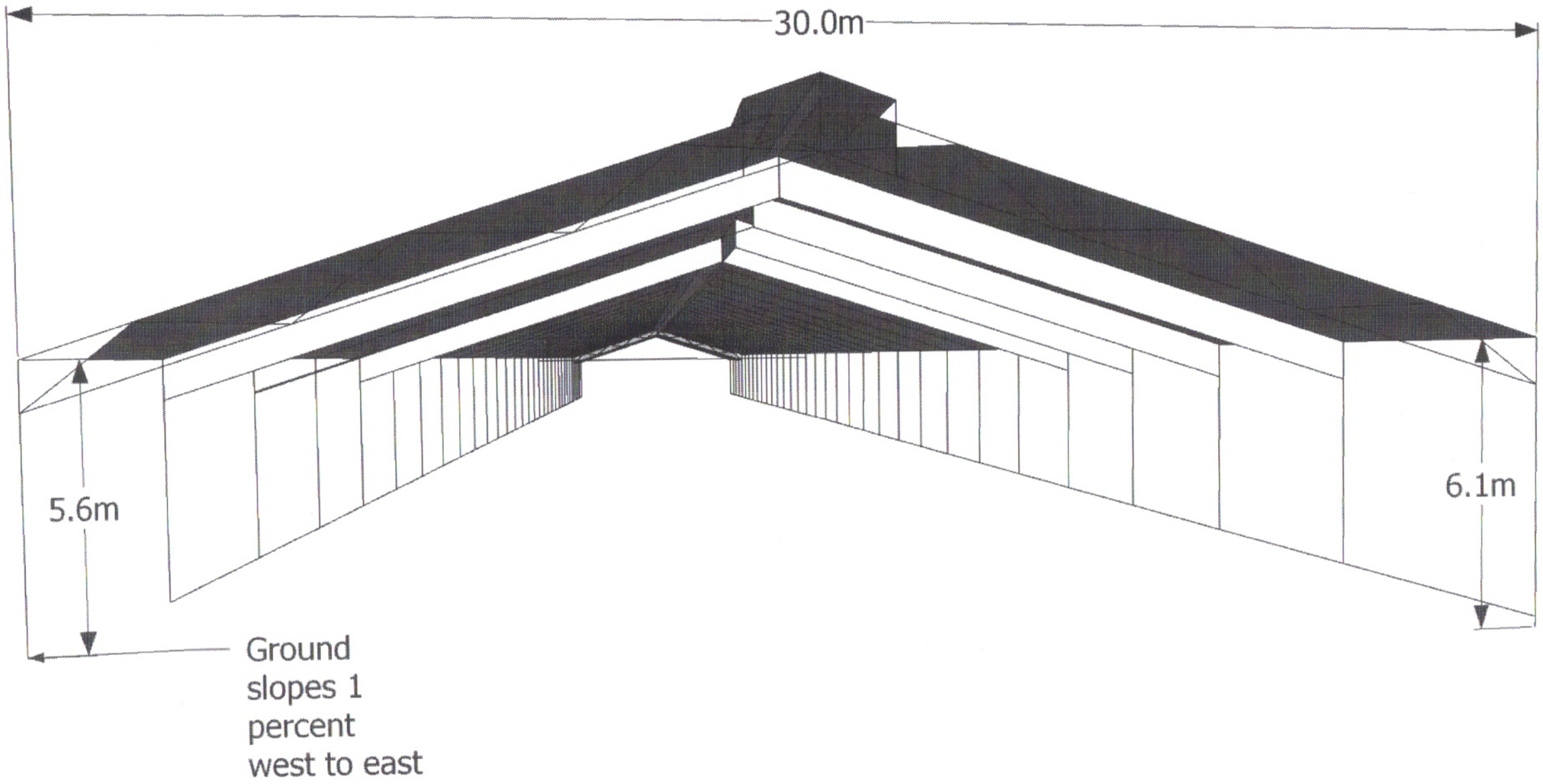

WBS GROUP

Client: Ucarty Holdings	Quote No:7354-3	View: Southern Elevation	Drawn: 24 September 2020