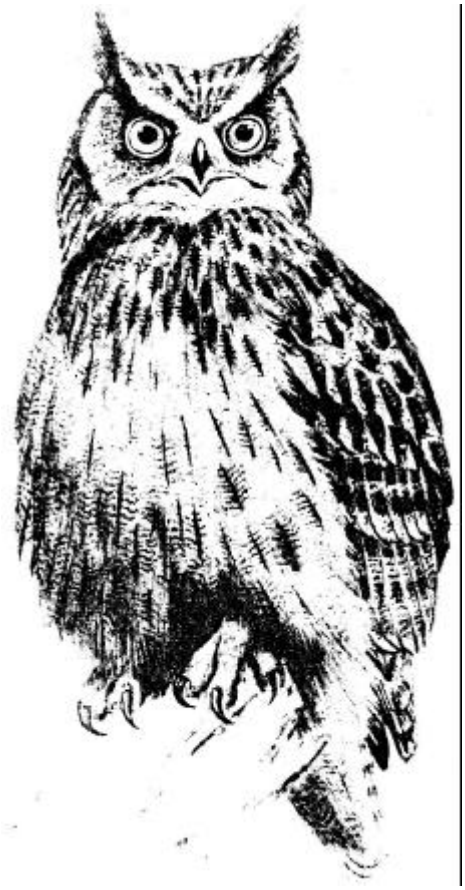
ALAM

Newsletter

Spring 2004



The Association of
Lecturers in Agricultural Machinery

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ALAM NEWSLETTER
SPRING 2004

2004 Conference

It won't long now until the 2004 conference at Warwickshire College, and Peter Walley has put a great programme together; further details are included in this Newsletter – put the dates in your diaries, fill in the Booking Form in this Newsletter, and start working on your staff development and personnel departments!

One-day Seminars

In the autumn, we are hoping to run a day of either hydraulics or electrics / electronics. If you have any suggestions for future training days, please contact any of the committee. Alternatively, bring your ideas to the Conference - think back to any recent training or companies you have visited, as this often provides the inspiration and contacts for our events.

Subscriptions

On April 1st, your standing orders should have moved £10 from your bank to ALAM – a big thank you to everyone who pays their subscriptions this way, as it saves a very great amount of time, postage and effort each year.

Thanks to everyone who has confirmed their addresses and details. If you haven't done so, please let me have your correct and current details by filling in a membership form and send it the treasurer, so we can update or confirm our records. If you already pay by standing order, then put a line through the lower half of the form, but please fill in the top and return it anyway.

Treasurer's New Address

On an administrative note, please note that the treasurer has moved house. Could you please ensure that any correspondence and payments are sent to his new home address. In particular, could you make sure that **College Finance departments update their records**. The new address is:

David Heminsley, ALAM Treasurer, The Old Byre, Lower Street, Doveridge, Ashbourne, DE6 5NS

We looking to forward to seeing you all at the Warwickshire conference!

A.I.A.M. Conference July 2003 at Walford College

I honestly cannot understand why this happened

IDW

THE COMMITTEE

Position	Name	Work			Home	
		Place	Tel	Email	Tel	Email
Chairman	John Gough	Rodbaston	01785 712209	j.gough @rodbaston.ac.uk	01630 685942	john_gough60 @hotmail.com
Secretary	Peter Walley	Warwickshire College	01926 318269	pwalley @warkscol.ac.uk	01926 640883	
Treasurer	David Heminsley	JCB Training	01889 591300	david.heminsley @jcb.com	01889 566882	
Committee	Ryan Roberts	Retired				mail@ ariel1965.freeserve.co.uk
	Nigel Macpherson	Sparsholt College	01962 776441	nmacpherson @sparsholt.ac.uk	01980 862102	
	Graham Higginson	Walford College	01939 26046	g.higginson @wnsc.ac.uk	01691 671461	graham.higginson @ntlworld.com
	Duncan Wilson	Duchy College	01209 722100	duncanw @duchycollege.ac.uk	01326 376710	
	Brian Kessell	Duchy College	01209 722100	briank @duchycollege.ac.uk		

CLASSIFIED SECTION

FOR SALE

SECONDHAND FROMENT 75KVA DYNAMOMETER

STATIC TYPE WITH LOAD BANKS.

PRICE £4000 ono.

Contact Nick Cartwright,
Email n.cartwright@oaklands.ac.uk
Tel. 01727 737735

Oaklands College,
Hatfield Road,
St. Albans,
Herts,
AL4 0JA

WANTED

Have you seen this bird?

We are again trying to track down a regular supply of ALAM owls. We could cast our own, if only we knew exactly what they are made from (some kind of resin), and where to get it. We also need a mould. If anyone spots anything which might help us, (craft fairs and shops are likely sources), please let us know. We can probably think of a suitable reward for your efforts!

ALAM ANNUAL TECHNICAL CONFERENCE 2004

WARWICKSHIRE COLLEGE

PROGRAMME

Monday 12th July 2004

1200hrs	Lunch @ Warwickshire College	
Depart for MF Training School at Stoneleigh		
pm	Combine electrics and hydraulics	Massey Ferguson Ltd
eve	Conference Dinner and AGM	

Tuesday 13th July 2004

Depart for MF Training School at Stoneleigh		
am	Constantly variable transmission	Massey Ferguson Ltd
pm	Rubber tracked Tractors	Massey Ferguson Ltd

Wednesday 14th July 2004

4 wheel drive vehicle development and testing — Gaydon Test centre

Gaydon is the test and development site for Ford/Land Rover. We will gain access to basically any development area, provided there is not sensitive material in there at the time. We should also gain access to the Land Rover test track. We will be divided into small groups and it promises to be very informative day

Thursday 15th July 2003

am	Developments in spraying technology.	Hardi Ltd

NB Massy Ferguson will split us into 3 groups to spend half a day on each topic. The above topics are not set at the moment and may change dependent upon the availability of instructors.

2004 ALAM CONFERENCE BOOKING FORM

WARWICKSHIRE COLLEGE

DAY	CONFERENCE	DINNER, BED & BREAKFAST
Monday July 12th	☐	☐
Conference Dinner		☐
Tuesday July 13th	☐	☐
Wednesday July 14th	☐	☐
Thursday July 15th	☐	

The total conference fee will be **£180** for members and **£190** for non-members including accommodation. If anyone wishes to attend for certain days or will not require certain meals or accommodation, will they please contact me and I will work out separate price for you

Cheque enclosed payable to **ALAM** for £_____

or

Please invoice me at the address below:

Name ..... Address: .....

Telephone: (Home)..... .....

(Work)..... .....

.....

Signature ..... Date:.....

Please return to:

Peter Walley

Warwickshire College

Moreton Morrell

WARWICKSHIRE COLLEGE

CV35 9BL

ALAM 2005 CONFERENCE.

European Study Tour.

THE ITALIAN JOB!

It's time to venture over the water again an visit our European neighbours to find out what cunning engineering developments they have been beavering away at since we last went to check up on them in 2000. This time it's the Italians turn to educate, entertain and enthuse us with their imaginative designs and innovative solutions.

The programme is currently being assembled and will include items which will be of benefit to our traditional membership but will also attract our colleagues with an interest in motor vehicles and motor cycles. All are welcome as it will help to keep the overall cost of the conference down for us all.

The plan is to fly into Milan.and use a coach for transport for the duration of the tour which will span about 7 days. The programme will include:

New Holland Fiat.

Merlo Telescopic handlers.

Grazziano Gear Manufacturing.

Same Tractors.

Ducati Motorcycles.

Ferrari .

This programme of events, when confirmed, should take us across the northern corridor of Italy and enable us to return to the UK from Bologna airport.

It is hoped that the cost of the tour will be around £ 350.00 so earmark some of that staff development budget for the coming year at an early stage as this is very good value for money and will prove to be invaluable continuous professional development.

The full programme and the booking form will be available in the autumn newsletter.

We hope that you will be able to join us.

Land Based Colleges National Consortium

HELP WITH PRODUCING TEACHING MATERIAL

The above consortium develops some very good material that is of great help in teaching. If you are not aware of the work that they do, go to their web site at www.lbcnc.org.uk

Most colleges are members and someone in your organisation will have the password to get into the full site. Try the Ag team.

The material published has been sent to them by member colleges. They then co-ordinate and develop it to produce a learning pack. Work submitted will get full recognition

Anna Rossetti contacted me recently as they realise that they are short of published material for Ag Engineering are actively looking into developing some material. Topics that were suggested are basic electrics and basic hydraulics

I am sure that you would agree that a pooling of some resources on these subjects is needed, we all have some material but some other ideas would be very beneficial.

Anna asked if I could make a plea for help from ALAM members in the newsletter.

Basically they are asking for any useful teaching material to be sent on the subjects. Things like handouts, diagrams, workbooks etc. to be sent to them so that they can produce a teaching pack.

Please contact Anna direct at LBCNC, 13 Morley Square, Bristol. BS7 9DW.

Tel 01179 423504

Thanks

Peter Walley

ALAM

in association with

OTLEY COLLEGE

AIR CONDITIONING COURSES

TWO ONE-DAY AIR CONDITIONING COURSES
ARE BEING RUN AT OTLEY COLLEGE IN SUFFOLK

ON

THURSDAY 27th MAY
&
FRIDAY 28th MAY

Cost £99 per person

If you are interested in these training days please contact

Brian Alexander,
Engineering Department,
Otley College,
Otley,
Ipswich,
Suffolk,
IP6 9EY

Tel. 01473 784230

WEDNESDAY 29TH OCTOBER 2003.

WELDING WITH INTELLIGENCE

This event was hosted by TPS FRONIUS at their Bilston premises in the West Midlands from where they run a sales, service and training operation. Our one day updating started with a brief background to the company and its origin.

Fronius was founded in 1945 and is a family owned and run company which is based in Austria and now employs about 2800 people. The growth and success of the company over the intervening years may in no small part be attributed to its stance and policy on research and development. Annually 7 to 10% of company turnover is reinvested in research and development and today there are over 200 people involved in this work.

The first product commercially produced was a battery charger and from that technology it was a small step to develop and build welding transformers. Once involved in this field the business grew and reacted to the needs of its customers by developing and building technically advanced equipment. This was made possible because the company had followed a specific recruitment policy and employed high calibre individuals to develop new products, a policy it still follows today.

Over the intervening years the company has been at the forefront with many of the developments that have taken place ;

1967 MIG machines were produced.

1980 Primary switched inverter power source produced. A world first.

1988 TIG hotwire, Pre heated wire producing a faster weld.

1990 TIME High performance MAG welding with the same heat input.

1998 The digital revolution in welding equipment starts for Fronius.

The manual metal arc welding process was discussed first and the following facts were drawn to our attention.

The conventional electric welder transformer is heavy, quite bulky and about 60% efficient (air or oil cooled). By comparison, the laminate switched unit which is used in an inverter is small, light, gives off very little heat and is 98% efficient.

The conventional machines run on mains 240 or 415v a.c. which has a frequency of 50 cycles per second.

This reduction in size and increase in efficiency is achieved through the use of electronics to carry out the high speed switching necessary to raise the standard frequency rate from 50 c/s to 100khz. Power amplification is achieved by this high speed switching of the voltage

which in turn amplifies the current. Thus the conventional transformer is replaced by a light powerful portable unit which can also be used for TIG work. We were given the switching unit used in these inverters to examine and it was little bigger than two packets of cigarettes with a series of solid electrical terminals emerging from its edges. When built into the inverter unit it makes an easily portable robust efficient industrial welding power pack that can be used for manual metal arc and TIG.

TIG welding.

TIG equipment can be operated in ac or dc voltage, DC is used for welding steels and stainless steel and the tungsten tip is sharpened to a point by grinding with the point facing against the direction of wheel rotation so the grinding marks run longitudinally from the tip. The electrodes have thorium or zirconium mixed with the tungsten and both of these elements are radioactive so it is important that adequate extraction equipment is in place.

AC is used for aluminium, brass, bronze and magnesium which all suffer an oxide build up on their surface. In ac mode the voltage signal is converted from the rounded sine wave to a square wave. The square wave allows the ac current to spend more time cleaning and heating the metal resulting in better quality welds. The tungsten tip has a ball shape for this process which is formed before you start welding.

Some of these machines are available with a facility to syncronise their operation with a second TIG welder to allow both sides of a joint to be welded simultaneously.

MIG /MAG welding.

This range of equipment seems to have undergone a major transformation in its capability and control over the quality of finished weld in spite of level of skill of the operator. It is difficult to adequately explain the full range of settings and options available but I will briefly list some of the features of these machines :-

MIG welding torch fitted with digital display and control buttons to adjust welding current, wire speed, arc length control and other weld parameters.

Machine programmable memory to store optimum settings of up to100 different jobs allowing efficient changeover for production work and a degree of quality control over the weld produced.

Machine sensing and self compensation for minor changes to wire stick out length made by the operator, thereby maintaining optimum settings during the welding process to maximize weld quality. This feature was very effectively demonstrated during the hands on session we undertook later, vertically welding aluminium when the arc sound could be clearly heard to alter as the nervousness of the operator was transmitted through the torch!

Machine programming enabling the operator to enter the basic information of material thickness and wire size and material type into the unit which then selects and maintains the optimum settings for good weld quality.

The two standard operating modes for MIG have been the dip transfer and the spray transfer systems. The pulsed arc system has been developed for these machines which apparently produces a swirling effect in the transfer process which results in a wider fusion area of weld to a depth in the parent material together with reduced spatter. The weld penetration of the test piece we examined had a bathtub shape to full weld depth.

Other test pieces shown included MIG brazing which is used for vehicle body repair due to reduced heat input and non fusion characteristics. This is particularly important on some of the modern bodies which use thin high tensile boron steel to produce the necessary strength with a reduced weight for the body.

The final visual aid had many of us looking in some disbelief at what we were being shown. It was two thin pieces of metal, one steel and the other aluminium --- these were then “welded” together! In fact it was a eutectic bond, which is a cold metal transfer process. Fronius have been working on this process for some time and just recently have perfected it. You will not be surprised to hear that a number of vehicle manufacturers are very interested in this technique!

Further advantages of the digital age were outlined and included the ability of the MMA equipment to sense and compensate for voltage drop caused by long supply and / or welding leads, and the ability to connect many of the different models of machine used for production work direct to the design department computers to transfer information on weld requirements for different jobs.

As mentioned earlier part of the day was given to practical application of all this high tech kit and the welding shop was soon filled with what must have seemed like a lot of over enthusiastic “students” to our minders. Much light, smoke and noise ensued while the minders attempted to keep up with the continuous demands for their technical expertise. The outcome of this mayhem was that we all emerged with the view that our welding skills had miraculously taken a giant leap forward……. until we realized that the digital technology might just have played a small part in the proceedings!

This was an excellent updating day which underlined to me the importance of keeping in touch with the technological developments that industry is producing and using, and the importance of an understanding of metallurgy if you are involved in welding repair work. Our thanks to the TPS FRONIUS staff for running the event and bringing us up to date.

Contact Bob Stacey, TPS Fronius,
108 Highfields Rd.
Bilston,
West Midlands,
WV14 0LD
Tel. 01902 495686
Fax 01902 496461
Web www.fronius.com
Email bobs@tps-fronius.co.uk

J.Gough.

FULLWOOD MILKING SYSTEMS

The Merlin System

Speakers Graham Greasley & George Rogers

Chairman Chris Creasey

Vote of thanks Emlyn Thomas

After a hearty breakfast and an entertaining drive to the venue we arrived at Fullwood Milking Systems in Ellesmere, Shropshire.

The company was formed in 1785, and there are now 14 companies worldwide located in 11 countries, with the main milking parlour plant at Ellesmere, with major components being sourced form sister companies; ie, electronics from Sweden, stainless steel components from northern Europe and cooling equipment from Zedelgem in Belgium.

The Merlin system is suitable for sheep, goats, cows and *buffalo!* The animals are free to enter the system at will, other major points with the system are as follows:

- Teat location, cleaning and attachment are fully automatic, using laser sensors and a pneumatic arm.
- Individual teat cup removal.
- Milk and conductivity recording via the Fullwood Fullflow milk meter.
- Fullflow identification system with ear tag, neck transponder or pedometer.
- Fusion Crystal herd management system.
- Cows free to enter at will - eliminates congestion in yards.
- More frequent milking - increases milk yields.
- Effective teat preparation before every milking reduces risk of mastitis, and improves milk quality.
- Each teat cup linked directly to milk receiver eliminates over-milking, therefore prevents cross-infection.
- *Frees farmer from the daily constraints of milking for other duties.*

The reaction when entering the works was of an old family business using simple but effective technology for the construction of solenoids for pulsators and vacuum regulators, with everything being date-stamped and traceable. In the machine shop, for example, CNC machines stand next to ancient lathes and drilling machines, the workforce being versatile, being able to operate each and every machine.

In the drawing office, standard procedures were undertaken. With the layout drawn and the equipment fitting in with existing systems. CAD CAM systems are used to undertake this work using the basic process as follows:

- An overview - the customer can see the proposed layout.
- Put in all the necessary equipment including gates and fencing.
- First concreting stage.
- The Architects and Builders input.

Moving on to the tool room was quite an eye-opener, as all the press tools and dies are fabricated on site. These are mainly for the injection moulding of the rubber components, ie, teats and cups, and for press tools with which to stamp out specific brackets. Automatic spark eroders work 24 hours a days to create new moulds, with each mould costing up to £8000 to make.

A 175 tonne press is used for moulding the rubber and plastic components using granules costing form £3000 to £6000 per tonne. Each item produced requires the surplus material to be removed by hand.

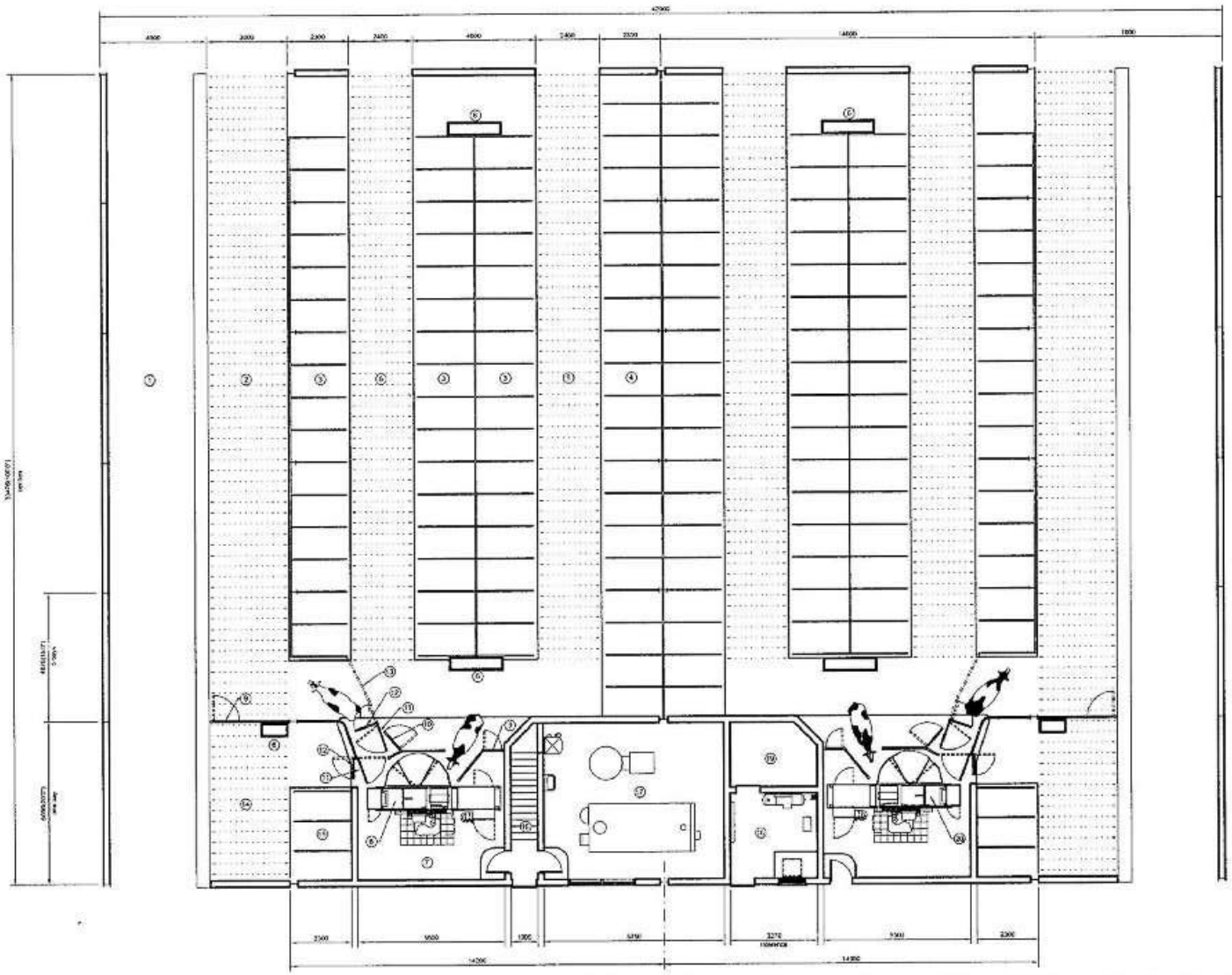
Metal and plate shops provide the laser cutting and welding for the cow stalls and all galvanising is carried out by outside contractors.

Castings are bought in for the vacuum pumps, the housings and rotors are machined on site using computer controlled lathes. Individual pumps are tested.

The visit concluded with questions from the floor, which were answered by George Rogers:

- Individual cows are co-ordinated by the machine and locked into the system memory.
- Teat configuration and spacing are checked by the computer for each cow and logged.
- There are cows which do not suit the system, up to 3% of a herd may not be suitable for the system.
- There is a limit to the number of fresh cows with high udders and they have to be helped through the system.
- The computer will tell you which cow has not been through the system.
- The unit will milk camels; in Oman there is a 1000 camel herd.
- The machine kicks out cows which come in to the system too frequently; it is important to get the cow traffic correct.
- There is mastitis detection - the system takes into account the milk temperature as it flows, and is checked 200 times per second.

Ian Whitehead



KEY

1. TRACTOR ACCESS/FEED PASSAGE.
2. FEED STANCE (SLATTED).
3. 16 CUBICLES.
4. 20 CUBICLES.
5. PASSAGE (SLATTED).
6. WATER TROUGH.
7. SCRAPER AREA.
8. MERLIN AMS UNIT (LEFT HAND).
9. GATE, NOT BY FULLWOOD.
10. HOME RETURN GATE FOR HEARD GATE NOT BY FULLWOOD.
11. OVERFLOW GATE CONTROLLED BY MERLIN AMS.
12. HOME RETURN GATE, NOT BY FULLWOOD.
13. FENCE TO PROVIDE A FORCED ACCESS SITUATION FOR TAGGING AND/OR SUMMER GRAZING. FENCE NOT BY FULLWOOD.
14. HOLDING AREA FOR APPROXIMATELY 10 COWS (INCLUDING CUBICLES).
15. CUBICLES.
16. STAIRS UP TO OFFICE AND POSSIBLE VIEWING GALLERY.
17. TANK ROOM WITH:
    6000 LITRE INSULATED MILK TANK.
    BUFFER MILK TANK.
    WATER HEATER/TANK WASHER.
    WASH BASIN.
    PLEASE NOTE: THAT FINAL DESIGN AND REQUIREMENTS OF TANK ROOM TO BE DETERMINED BY OPERATOR TO POSSIBLE CHANGE OF BULK AND BUFFER TANKS.
18. PLANT ROOM WITH:
    CONDENSING UNITS.
    COMPRESSOR UNIT.
    REFRIGERANT DRYER AND FILTERS.
    MAINS ELECTRICAL DISTRIBUTION PANEL.
19. DAIRY/GENERAL STORE.
20. MERLIN AMS UNIT (RIGHT HAND).

ALL DIMENSIONS ARE IN MILLIMETRES.

TWIN UNIT STAINLESS STEEL 'MERLIN' AUTOMATIC MILKING SYSTEM WITH ASSOCIATED FACILITIES.

FULLWOOD
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A Member of the Fullwood Packo Group of Companies

Drawn: M.H. Scale: 1:75
Checked: M.H. Date: 2.07.03

DRAWING NUMBER.