

REPUBLIC OF KENYA



MINISTRY OF LOCAL GOVERNMENT

LOCAL AUTHORITY DEVELOPMENT PROGRAMME

TECHNICAL MANUAL

Markets

OCTOBER 1986

CONTENTS	PAGE
INTRODUCTION	2
SECTION ONE : FEASIBILITY	3
what is a market?	
what are the sources of income?	
how big will it be?	
how much will it cost?	
SECTION TWO : THE SITE	30
the site	
site layout	
SECTION THREE : DESIGN	43
detailed planning	
SECTION FOUR : MATERIALS	80
material choice	
SECTION FIVE : MANAGEMENT	89
revenue collection	
construction	
SECTION SIX : APPENDICES	98
specifications	
general notes	
worksheet blanks	

INTRODUCTION

This manual is part of the LADP Guidelines Series and provides detail and assistance to Local Authorities, to help ensure that markets developed by them will work well and generate the maximum income. The manual can be used in any of the following ways:

USE OF THE MANUAL

- * FEASIBILITY To give guidance on how to establish the size and cost of a market when working with Manual Two, Feasibility Studies.
- * DESIGN BRIEFS ... To provide a basis for putting together the information necessary for a design brief and to help identify the component parts of the proposed market.
- * DESIGNING To provide technical information and planning advice on how markets should be designed.
- * CHECKLIST To provide a checklist against which to check any design when it has been submitted for approval.
- * MANAGEMENT To provide some management advice for running a market.

SECTION ONE --- FEASIBILITY

CONTENTS	PAGE
1. WHAT IS A MARKET ?	
1.1 a source of income	4
1.2 a public service	4
1.3 effects of an expensive market	5
1.4 conclusion	5
2. WHAT ARE THE SOURCES OF INCOME?	
2.1 vendors	6
2.2 other revenue sources	6
3. HOW BIG WILL THE MARKET BE ?	
3.1 how to carry out a survey	7
3.2 survey sheet	8
3.3 what the survey will tell you	9
3.4 sorting the survey information	11
3.5 types of marketing accommodation	12
3.6 advertising	14
3.7 planning for growth	15
3.8 sizing the marketing areas	17
3.9 data log	18
4. HOW MUCH WILL THE MARKET COST ?	
4.1 estimating methods	19
4.2 updating estimates	22
4.3 construction cost estimate worksheet - high specification	23
4.4 construction cost estimate worksheet - low cost	24
4.5 cost analysis	25
4.6 loans and repayments	26
4.7 income and expenditure	26
4.8 upgrading	27
4.9 expenditure checklist	28
4.10 capital and maintenance costs	29

SECTION ONE --- FEASIBILITY

1.0 WHAT IS A MARKET ?

Although this might seem too obvious a question to ask, in this context it does help to highlight the priorities when developing a market.

1.1 A SOURCE OF INCOME A market has one main function, and that is to provide the Council with revenue to enable it to develop or maintain other non-revenue earning facilities for the good of the people of the town or district. Therefore, the lower the cost of construction and management of the market the higher the amount of revenue earned.

1.2 A PUBLIC SERVICE The market itself provides a useful facility for the area. The better the facility, the better the chances of success at revenue earning.

In order to maintain a useful produce distribution system around Kenya, people must be able to afford the produce. In order to keep these costs within affordable limits, operating costs of the market must be kept as low as possible.

1.3 EFFECTS OF AN EXPENSIVE MARKET

If the Council builds an expensive market then in order to recover the repayment charges it will have to make higher charges to the vendors using the market. This will have two effects:

- * VENDOR RESISTANCE The vendors will resist using the facility to avoid the higher charges. This will in turn increase the cost of enforcing the Council's regulations and the market may be in danger of standing idle.
- * INCREASED PRICES The vendors will put up the prices of their produce which may well reduce the number of people buying, again reducing the possible income for the vendors.

1.4 CONCLUSION

It follows that the lower the overall cost of the market, including both construction and maintenance costs, the greater the benefit to the Council, the vendors and the people buying produce.

2.0 WHAT ARE THE SOURCES OF INCOME?

We have seen that the market should mainly be regarded as a source of income for the Council. We now must ask the question; "Where does the money come from?"

2.1 VENDORS

The main source of revenue from a market is from the charges made to the vendors for the use of this facility. The Council has to set its charges at such a level that it will receive the maximum possible income from the market without creating vendor resistance.

2.2 OTHER REVENUE SOURCES

- * ON-SITE FACILITIES ... Other possible sources of revenue from markets are rents for kiosks, shops and possibly cafeterias. These facilities are discussed in detail in the Design section, page 43 onwards. The amount of income arising from these facilities will vary considerably from town to town. Local information will have to be sought to assess what rents should be charged.
- * ADVERTISING As a well used public space a market can be a popular area for all sorts of advertisements, and the Council can gain more revenue by leasing advertising space in the market.

3.0 HOW BIG WILL THE MARKET BE ?

The next step to be carried out in assessing the feasibility of the proposed market, or of an extension to an existing market, is to find out what the demand is. There is only one real way to do this, and that is to carry out a survey.

3.1 HOW TO CARRY OUT A SURVEY

People should be sent out around the town to record all the stalls and hawkers selling food produce, small domestic goods, clothing and so on. Each of these selling spaces should also be measured to give an idea of the area required and the volume of goods on sale.

This survey should be carried out on each day of the week, or at least on market days and other days when hawkers are known to be selling around the town.

There is likely to be a difference between market days and other days. It is important to find out the different types of goods for sale on different days and the increase in volume expected on market days.

Where there is already an existing market, the Council should have information on the demand for existing stalls.

A sample of the sort of record to be kept is shown on page 8. A blank copy of this survey sheet is included in appendix three.

3.2 SURVEY SHEET

LOCATION: Ndoto township

SURVEYOR: Brook Ngache, Assistant Market Master
 DATE: 17 August 1986

No.	Location	Area of Stalls	No of Stalls	Type of Goods	Type of Stall
1.	Bunyala St	1mx 1m	1	Oranges	Hawker
2.	"	1mx 1m	1	Tobacco	Hawker
3.	Onyango Rd	2mx10m	5	Vegetables	Covered stall
4.	Behind Bank	10mx40m	25	Clothing	Laid on ground
5.	Bus Park	4mx 5m	10	Vegetables	Covered stall
		2mx 2m	2	Klondos	Stalls
		1mx 6m	3	Plastic Goods	Barrow/Tables
		3mx 3m	3	Clothing	Tables
6.	Existing Market	5mx20m	16	Vegetables	Stalls
8.	Blashara St	1mx 4m	1	Tea, Sugar Sodas, Cigarettes etc.	Kiosk
9.	Spring Valley	3mx 5m	1	Charcoal	Open

This column shows the number of stalls found at each location.

This column shows the area covered by stalls found at each location

3.3 WHAT THE SURVEY WILL TELL YOU

The survey sheet, a sample of which we have seen on page 8, shows where all the vendors have chosen to try and sell their goods. In larger towns the survey may indicate that there are two or maybe three areas where large groups of vendors have set up stalls. In such cases the Council will have to decide whether it would be more useful to have a number of smaller suburban markets rather than a single central market.

If the Council decides to divide the marketing up into suburban markets then the survey must be divided up to give separate survey data for the areas to be served by each of the proposed suburban markets.

The explanations which follow can be applied to each of these markets separately.

- * CURRENT DEMAND Once the survey has been carried out over the selected days, the full survey will give a good indication of the current demand. This will be the demand shown on the day when the maximum number of vendors were recorded. It should be noted that this demand is for the whole survey area.
- * ANTICIPATED INCOME Income can be determined by multiplying the stalls or selling areas by the anticipated charges to be made by the Council. This will give an idea of the total possible income which could be obtained from charges made by the Council authorizing the sale of marketable goods and produce around the town, or each survey area.

- * **STALL SIZES** If there are a number of large stalls around the town selling goods, the Council will have to consider whether to separate the market into wholesale and retail sections.

Recording the number of stalls and the area they cover when carrying out the survey is important because this comparison shows how big each of the stalls in each group are.

The areas covered by the different sorts of goods will give guidance on the sizing of their respective parts of the market.

The individual areas covered by each stall will give guidance on the best market stall sizes for different types of goods.

- * **NUMBERS OF STALLS** The numbers of stalls recorded in the survey give an overall guide as to the number of vendors that the market will have to allow for.

3.4 SORTING THE SURVEY INFORMATION

Having now gathered the field information on the expected demand for the market, a judgement has to be made as to which vendors would be selling in the market. To do this the following factors have to be considered;

- * **MOBILE STALLS** Hawkers generally rely on being able to move a small amount of goods around the town to sell at convenient places where they can find willing buyers. It is unlikely that hawkers will move into the market and so they should not be included in the assessment of space required.
- * **LOCATION SELLING**....Most kiosks, for example, will have been set up in a position that the owner believes is suitable for the sale of the type of goods he has to offer. As this is the rule rather than the exception, the Council should advertise kiosk space in the new market and assess the demand from the replies received, and kiosks counted around the town should not be included in the assessment of space required.

Other types of stall, such as the charcoal vendor, may also be examples of location selling and therefore unlikely to want to move to the new market. If such stalls can be identified then they should not be included in the assessment of space required.

- * **COUNCIL POLICY** The Council must decide what its policy will be towards the vendors who are unlikely to want to move to a new market. They can accept them and issue them with hawkers licences as the means of collecting revenue from them. Alternatively the Council may decide they are a public nuisance and prevent vendors from selling outside the market. In this case the vendors will probably require space in the market as the next best choice.

3.5 TYPES OF MARKETING ACCOMMODATION

Having adjusted the survey data to make allowance for these considerations, the survey data then has to be divided up into the several different types of accommodation required. Further information on how this data should be put together and used is given on page 18.

- * SHOPS The potential shops include both the replies received from the newspaper advertisements and all the kiosks that are fairly central and not obviously located where they are for another good reason. Note the comments on Council policy on page 11.

The total area of these two groups taken from the log, plus 50% for circulation will be the area needed in the market for shops.

- * RETAIL STALLS ... The small stalls of all types that sell on most days of the week can be assumed to require a stall in the retail part of the market. If the market is only to be opened on specific market days then this will also include the stalls that regularly sell on market days. In addition there are the responses to advertising and the Council's information on demand for extra stalls in the existing market. The total area required for all of these will be 3 times the stall area recorded. That includes an allowance for the vendor and circulation.

- * WHOLESALE AREAS There may be stalls which sell in bulk, but it is more likely that the Council will find out about the demand for wholesaling through advertising. Bulk selling stalls and the responses to advertising should be included in the wholesale part of the market. They will need between 1.5 and 2 times their stall area to allow for the vendor and circulation.

- * **OPEN-AIR MARKET** The existence of an open-air market depends to a large extent on when the covered market will be open. If the market is open for most of the week, then all the stalls that appear only occasionally will not be able to afford to rent a permanent stall in the covered market. They will normally sell from an open-air market. If the covered market opens only on market days then there will be less need for an open-air market. There are still likely to be some vendors who will sell only occasionally and in very small quantities. They are usually farmers or smallholders who come to sell some produce whenever they have it to sell. An area of 2 times the total maximum stall area, of these types of stalls, recorded in the survey should be allowed for an open-air market.
- * **OFFICES** In small markets a single office will be sufficient and this should be 10 sq.metres.
- * **CLEANERS** .. Markets need cleaning often. A 2 sq. metre store for cleaning equipment is a minimum requirement, plus a room for cleaners in larger markets. This will vary depending on the size but an allowance of 1.5 sq.metres for each cleaner is a good guide.
- * **OTHER ACCOMMODATION** ... The market may also have public toilets, tea rooms, a cafeteria, loading areas and additional kiosks. These are all discussed from page 43 onwards.

The Ministry will be able to provide comparative information on the size of and the accommodation provided in similar markets around the country.

3.6 ADVERTISING

The survey provides useful information about the vendors already selling goods and produce around the town, but there are other people who will be interested in selling through the market. In order to find out about these people, the Council will have to advertise.

In small towns the most effective form of advertising is likely to be putting up posters around the town. Alternatively, an advertisement could be put in the local newspapers. Advertising should be carried out over a period of about a month.

The advertisements should state that anyone interested in opening a shop, kiosk or stall in the new market should contact the Council with information on the goods they wish to sell and an approximation of the area required. The advertisement should also give an estimate of the likely rental cost of a shop or stall.

3.7 PLANNING FOR GROWTH

* **EXPECTED GROWTH.....**When planning the market it should be remembered that in all probability it will expand with time. As demand is directly related to population it is reasonable to expect an average of 4% per annum growth, which is the current national average. In highly populated and urban areas, which are the areas which concern developments of this nature, this figure may be as high as 6%. In rural and low population areas it may be as low as 2%.

GROWTH TABLE

At a growth rate of; (percent)	to require additional capacity of; (percent)	will take (years)
2	50	21
2	100	35
4	50	10
4	100	17
6	50	7
6	100	12

This indicates that to allow for 10 years usage without expanding, at the national average growth rate of 4%, markets should be 50% oversized.

In high population growth areas, 6% growth rate, the excess capacity should be increased to 100%.

Any other information that is available which might be helpful in making a judgement on the likely growth rate of the area should be used. Examples of such information might be:

- a 5 year development plan,
- a growing satellite town,
- a proposed town by-pass,
- a proposed new industry.

* GROWTH OPTIONS.....Two options are available. Either the market can be built to just meet current demand but with an additional space allowance for expansion when required, or it can be built a little over-sized to cater for some expansion and so delay the need to expand.

If the loan interest rate available to the Council is low then it is better for the Council to plan to build the additional capacity at the time of construction of the market. An example of this is the current government loans, which are offered at 6.25% over a period of 30 years.

On the other hand, if the loan interest rate available to the Council is high, then it is better for the Council to plan to extend the market at some future date. Current examples of this are international loans which are offered at between 11.25% and 15% over a period of 25 years.

Whether or not the Council decides to build, it is important to ensure that the land is available at the proposed site for future expansion to take place.

3.8 SIZING THE MARKETING AREAS

All the information gathered from the survey and the advertising must be put together in a form that will help to show the size of market required. One useful way of doing this is to make out a data log.

Someone needs to sit down and make a series of charts like the sample shown on page 18. Each chart is for one type of accommodation and should contain all the different details gathered in the survey and from the advertising on that one type of accommodation only.

The sample on page 18 shows how this data log might be completed for retail market stalls.

The totals from all of the data log sheets created in this way can then be added together to give a total for all of the marketing areas.

To obtain the full size of the market the other facilities provided (such as public toilets, parking, loading areas, tea rooms, a cafeteria, ticket check booths, washing areas, refuse disposal areas, offices, cleaners and stores) should also be added to this total. Guidance on the sizes of these facilities is given in section three, Design, which starts on page 43.

3.0 DATA LOG

LOCATION: Ndoto township

SURVEY DATE/REF: 17/8/86 DATE: September 1986
 MARKETING TYPE: Retail stalls only

TYPE	Total stall area (sq.metres)	No of stalls	Average stall size (sq.metres)
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SURVEY DATA

vegetables	140	/	58	=	2.4
plastic goods	20	/	10	=	2.0
kiondos	6	/	3	=	2.0
tobacco	2	/	2	=	1.0

PLUS

advertising	10	/	10	=	1.0
existing market	75	/	32	=	2.3
excess demand	27	/	12	=	2.3

Totals	280	/	127	=	2.2
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Total expected area (sq.metres) 280
 Factor for circulation and vendor x 3

Total current demand (sq.metres) 840
 50% addition for future expansion (sq.metres) 420

Total marketing area required (sq.metres) ... 1260

4.0 HOW MUCH WILL THE MARKET COST ?

In trying to decide how much an extension or a new market will cost, the main difficulties are both obtaining accurate costs and making sure the cost figures used are up to date.

4.1 ESTIMATING METHODS

There are several ways of doing this;

- * PREVIOUS PROJECTSOne way is to find out from the Ministry of Local Government what the costs have been for other recently constructed markets elsewhere in the country. A comparison of the sizes and locations of such markets will give a good idea of the necessary budget and the standards of construction that can be considered.
- * BUILDERS ESTIMATEAnother useful way is to put together a summary of the facilities required and ask one of the building contractors who might do this work to give an estimate.

* **BUILDING COST INDEX** This is a figure which has been calculated by adding together the costs at any one time of a set range of materials and services required in building construction. This is the Building Cost Index at that time. Variations in the cost of construction over any period of time are very closely related to variations in the Building Cost Index.

The Central Bureau of Statistics produces such an index from time to time. By checking against previous indexes it can be seen how building costs have varied. By assessing a large range of products they can be very accurate in recording variations.

It is possible to create a simplified version of this Building Cost Index. The most important aspect of this Building Cost Index is the correct balance in the selection of materials and labour so as to make the index vary in the same way that building costs are likely to vary.

A good and simple selection, in which the quantity of each element has been weighted to allow for its likely impact on the cost of a project, is as follows:

Labour; one man for 1month (205hrs)	sh. 880
Mabati; 6 sheets, 26 gauge, 1m wide	sh. 500
Cement; 6 bags, 50kg each	sh. 360
Timber; 15 metres 100x75 mm sawn cyprus	sh. 260
	<hr/>
Total cost. January 1986 Cost Index	sh. 2000
	<hr/>

These prices date from January 1986 in Nairobi, and so also are the prices used in making up the construction cost estimate worksheets on pages 23 and 24.

This makes it fairly simple to make a construction cost estimate whenever it is needed at any time, anywhere in the country.

Firstly, the cost of the items making up the index should be found out in the place where construction is to take place. That is the current Building Cost Index for that place.

Secondly, this current Building Cost Index must be divided by the January 1986 Building Cost index. The resulting figure is the Cost Index Ratio. This relates the current building construction costs (from the place where the prices were obtained) to those in January 1986 (in Nairobi).

Finally, the figures given in the worksheets on pages 23 and 24 should be multiplied by this Cost Index Ratio. The result will be a rough estimate of the expected current cost.

Either the individual rates for each element can be used with the new areas required for the proposed construction, or the total for the whole market can be used. Using the elemental rates will give a more accurate estimate, but may not be appropriate for an early feasibility estimate.

Sample worksheets on pages 23 and 24 show how this information might be set out. A blank copy of this sheet is given in appendix 3. Once these basic prices have been put together they can be checked against the budget and if necessary the sizes and specifications of the various parts can be adjusted.

4.2 UPDATING ESTIMATES

If estimates are old and need to be updated then inflation needs to be considered. Between 1975 and 1985 inflation averaged about 10% each year, but this must be expected to vary, as the range over those years was between 3% and 18%. The Ministry may be able to advise on inflation over recent years, or at least obtain the information from the Works Department of the Ministry of Works, Housing and Physical Planning. Any estimate needing updating should be multiplied by the inflation rate for each year in turn to bring it up to date.

4.3 CONSTRUCTION COST ESTIMATE WORKSHEET - high specification

Design element	Size, Area, No of units		Cost for each unit	Estimated cost
1. roofing - retail	702 s.m	x	547/-	= 384,000/-
wholesale	512 s.m	x	327/-	= 167,400/-
2. offices	9 s.m	x	1,000/-	= 9,000/-
3. cleaners	12 s.m	x	1,000/-	= 12,000/-
4. stores	2 s.m	x	1,000/-	= 2,000/-
5. walling	330 s.m	x	110/-	= 36,300/-
6. fencing	140 l.m	x	190/-	= 26,600/-
7. signs	20	x	1,000/-	= 20,000/-
8. paving - retail	960 s.m	x	350/-	= 336,000/-
wholesale	512 s.m	x	120/-	= 60,900/-
9. stalls	40	x	1,250/-	= 50,400/-
10 public toilets alternatives; (fill in one only)				
flushing	none	x		= nil
latrine	6	x	5,500/-	= 33,000/-
11 washing facilities	1	x	10,000/-	= 10,000/-
12 stormwater drains	189 l.m	x	45/-	= 8,500/-
13 ticket check booth	1	x	10,500/-	= 10,500/-
14 roads/parking alternatives; (fill in one only)				
murrum	none	x		= nil
tar spray	none	x		= nil
premix	none	x		= nil
pcc blocks	285 s.m	x	315/-	= 89,800/-
concrete	none	x		= nil
15 curbs	125 l.m	x	216/-	= 27,000/-
16 loading platform	1	x	30,000/-	= 30,000/-
17 landscaping	20 trees	x	1,000/-	= 20,000/-
18 security lighting	10 lights	x	2,500/-	= 25,000/-
19 kiosks	72 s.m	x	1,000/-	= 72,000/-
20 cafeteria	66 s.m	x	1,500/-	= 99,000/-
21 tea rooms	28 s.m	x	1,500/-	= 42,000/-
22 SUBTOTAL				1,571,400/-
23 Contingency (15%)				235,700/-
24 Contract overheads (10% pa)				157,100/-

25 CURRENT TOTAL CONSTRUCTION COST.....1,964,200/-

This total will only be valid for a few months around the time of preparing the estimate. In order to update it, or to predict the cost at some future date an allowance must be added for inflation.

It is usual to add an inflation percentage. This varies but should be in the region of 10% for every year between drawing up the estimate and work starting on construction.

FUTURE TOTAL CONSTRUCTION COSTS:

26 Inflation	10%	(see 4.2 UPDATING ESTIMATES, p22)
27 After 1 year	; item 25 x $\frac{100 + \text{item 26}}{100}$2,160,600/-	
28 After 2 years	; item 27 x $\frac{100 + \text{item 26}}{100}$2,376,700/-	
29 After 3 years	; item 28 x $\frac{100 + \text{item 26}}{100}$2,614,300/-	

4.4 CONSTRUCTION COST ESTIMATE WORKSHEET - low cost

Design element	Size, Area, No of units		Cost for each unit		Estimated cost
1. roofing - retail	615 s.m	x	327/-	=	201,000/-
wholesale ..	none	x		=	nil
2. offices	9 s.m	x	1,000/-	=	9,000/-
3. cleaners	none	x		=	nil
4. stores	2 s.m	x	1,000/-	=	2,000/-
5. walling	330 l.m	x	110/-	=	36,300/-
6. fencing	140 l.m	x	190/-	=	26,600/-
7. signs	10	x	1,000/-	=	10,000/-
8. paving.. retail	615 s.m	x	120/-	=	73,800/-
.. wholesale ...	none	x		=	nil
9. stalls	40	x	1,250/-	=	50,400/-
10 public toilets alternatives; (fill in one only)					
flushing	none	x		=	nil
latrine	6	x	5,500/-	=	33,000/-
11 washing facilities ...	1	x	10,000/-	=	10,000/-
12 stormwater drains	189 l.m	x	45/-	=	8,500/-
13 ticket check booth ...	1	x	10,500/-	=	10,500/-
14 roads/parking alternatives; (fill in one only)					
murrum	285 s.m	x	52/-	=	14,800/-
tar spray ...	none	x		=	nil
premix	none	x		=	nil
pcc blocks ..	none	x		=	nil
concrete	none	x		=	nil
15 curbs	none	x		=	nil
16 loading platform	none	x		=	nil
17 landscaping	none	x		=	nil
18 security lighting	none	x		=	nil
19 kiosks	6	x	tenant	=	nil
20 cafeteria	none	x		=	nil
21 tea rooms	2	x	tenant	=	nil
22 SUBTOTAL					485,900/-
23 Contingency (15%).....					72,900/-
24 Contract overheads (10% pa).....					48,600/-
25 CURRENT TOTAL CONSTRUCTION COST					607,400/-

This total will only be valid for a few months around the time of preparing the estimate. In order to update it, or to predict the cost at some future date an allowance must be added for inflation.

It is usual to add an inflation percentage. This varies but should be in the region of 10% for every year between drawing up the estimate and work starting on construction.

FUTURE TOTAL CONSTRUCTION COSTS:

26	Inflation	10%	(see 4.2 UPDATING ESTIMATES, p22)	
27	After 1 year ; item 25 x $\frac{(100 + \text{item 26})}{100}$			668,100/-
28	After 2 years ; item 27 x $\frac{(100 + \text{item 26})}{100}$			734,900/-
29	After 3 years ; item 28 x $\frac{(100 + \text{item 26})}{100}$			808,400/-

4.5 COST ANALYSIS

Looking at the figures given for the cost of the market shown in the worksheet, one can see that there are a large range of costs.

It can be seen that the total cost varies from 607,400/- to 1,964,200/-, an increase by a factor of 3.25 from the lowest to the highest price.

This includes an increase in general costs by a factor 3.3 and in the building structure by a factor of 2.9.

The average cost of the roofs makes up 35% of the construction cost of the market. It can be seen from this that the decision concerning the type of roof to be used has a greater effect on the cost of the market than anything else.

The average building structure cost of these markets makes up 65% of their total cost.

4.6 LOANS AND REPAYMENTS

Once a construction cost has been estimated this can be used to establish the size of loan repayments. The methods for doing this are set out in Manual 2, Feasibility Studies.

4.7 INCOME AND EXPENDITURE

A study of income and expenditure is an essential part of any feasibility study. Although more is said about this in Manual 2, Feasibility Studies, a checklist of the expenditure items that require consideration for a market is provided on page 28. The sources of income have already been listed on page 6.

Figures should be put against each of these and a comparison made between income and expenditure. This will also show up elements that are likely to, or actually are, costing more than they should.

4.8 UPGRADING

Upgrading of the market should be considered at every stage of the market's development. As time passes towns tend to grow in size and importance and the country builds up its economic strength.

As this process continues the attitudes of the people will change and they will come to expect higher standards in all areas of their lives, including the public services and facilities.

In addition to these increasing expectations, a growing population will require larger and better equipped facilities. There are many markets around the country that are simple fenced areas with a few kiosks and local farmers selling their produce under the trees. Soon, however, this will not be enough and local traders will buy the produce and will build stalls to sell it from. Then the Council may decide to pave the market area. Later, this market will be covered and then, perhaps, a wholesale market will be required.

This constant upgrading in both size and quality must be anticipated and allowed for in the Council's finances and planning. An allowance of 20% of the income from the market would be a good guide figure for this upgrading.

4.9 EXPENDITURE CHECKLIST

CAPITAL EXPENDITURE

Land purchase
 legal costs
 survey costs

Construction capital cost
 consultants fees

ON-GOING EXPENDITURE

Loan repayments... land
 construction

Management insurance
 advertising
 printing (tickets etc)

Staff manager
 assistant/clerks
 askaris
 cleaners
 toilet attendant

Maintenance..... cleaning materials
 painting
 repairs
 toilet upkeep

Upgrading..... (see 4.8, page 27)

4.10 CAPITAL AND MAINTENANCE COSTS

* CAPITAL COSTS.....It is important that the relatively high initial cost of the market is well spent and the Council can expect the market to last a long time. One way of keeping the initial construction cost down is to build a relatively cheap market by selecting the cheaper options for construction. Once built this will start bringing in revenue. As the lower capital cost will mean smaller loan repayments, some income can be put aside for maintenance and some for future upgrading. This upgrading can be expected to carry on for many years as the town grows.

* MAINTENANCE COSTS.....In order to avoid very costly replacement or rebuilding of parts of the market it is essential to put aside some of the income for maintenance. An allowance of 10% of the income from the market would be a good working figure.

A large proportion of maintenance is part of the day to day upkeep of the market and will normally be done by cleaning staff. General repair work, such as repairing broken windows or doors or repainting buildings, may be done each year or as necessary. This should also include an allowance for cleaning out latrine pits or septic tanks where these systems have been used.

SECTION TWO --- THE SITE

CONTENTS	PAGE
1. THE SITE	
1.1 where the market should be	31
1.2 what the site should be like	32
1.3 access to the site	33
1.4 loading bay diagrams	34
2. SITE LAYOUT	
2.1 orientation	35
2.2 orientation diagrams	36
2.3 general arrangement on site	38
2.4 general arrangement diagrams	39

SECTION TWO --- THE SITE

1.0 THE SITE

Having had a preliminary look at the feasibility of building or repositioning a market, the next consideration is its location. If there is already an existing market which is to be extended or even rebuilt, then the issue does not arise. If, however, the town needs a new market then the question is, "Where should it be?", as the choice of location will have a direct effect on the success of the market.

1.1 WHERE THE MARKET SHOULD BE

Factors to consider include:

- * LOCAL CUSTOM Every town now has its regular marketing areas. It is worthwhile studying where these are as they will almost certainly be in response to a need and following such local customs will increase the attraction of the new facility.
- * THE BUS PARK ... A large proportion of customers are coming to buy or sell goods by public transport - so the market should be next to the bus park. This is traditionally one of the most popular locations and should be rejected only with very good reason.
- * MAJOR ROUTES Many people travel long distances with heavy goods to sell at their local market - so the market should be as central as possible and situated on or near major routes.

1.2 WHAT THE SITE SHOULD BE LIKE

The question of the size of the site has already been discussed on pages 15 to 18, and this must be the first criterion of any choice. There is one other important characteristic that makes an especially good market site, it should be as flat as possible.

If the site is big enough, flat and in the right place, then a good layout for a market can be designed for it. In rare circumstances where the Council has a choice of a number of equally good sites, then the following may be considered;

- * DRAINAGE Areas which are liable to flooding should be avoided. The large flat area created by a market will collect large volumes of water in heavy rain. Unless this can be reliably disposed of it will cause trouble whenever it rains.
- * TREES ... Because people will have to spend some time in the market, a site with a number of established trees will have an immediate advantage. The layout should be designed to use them if at all possible.
- * EXISTING USERS .. If there are already kiosks on the site then it is likely to be a good site from the point of view of following local custom. These vendors should be encouraged to apply for kiosks in the market, and they can be temporarily relocated during construction. If there are other temporary structures on the site the Council must decide if it is willing to relocate them, and if so should start the process early.

1.3 ACCESS TO THE SITE

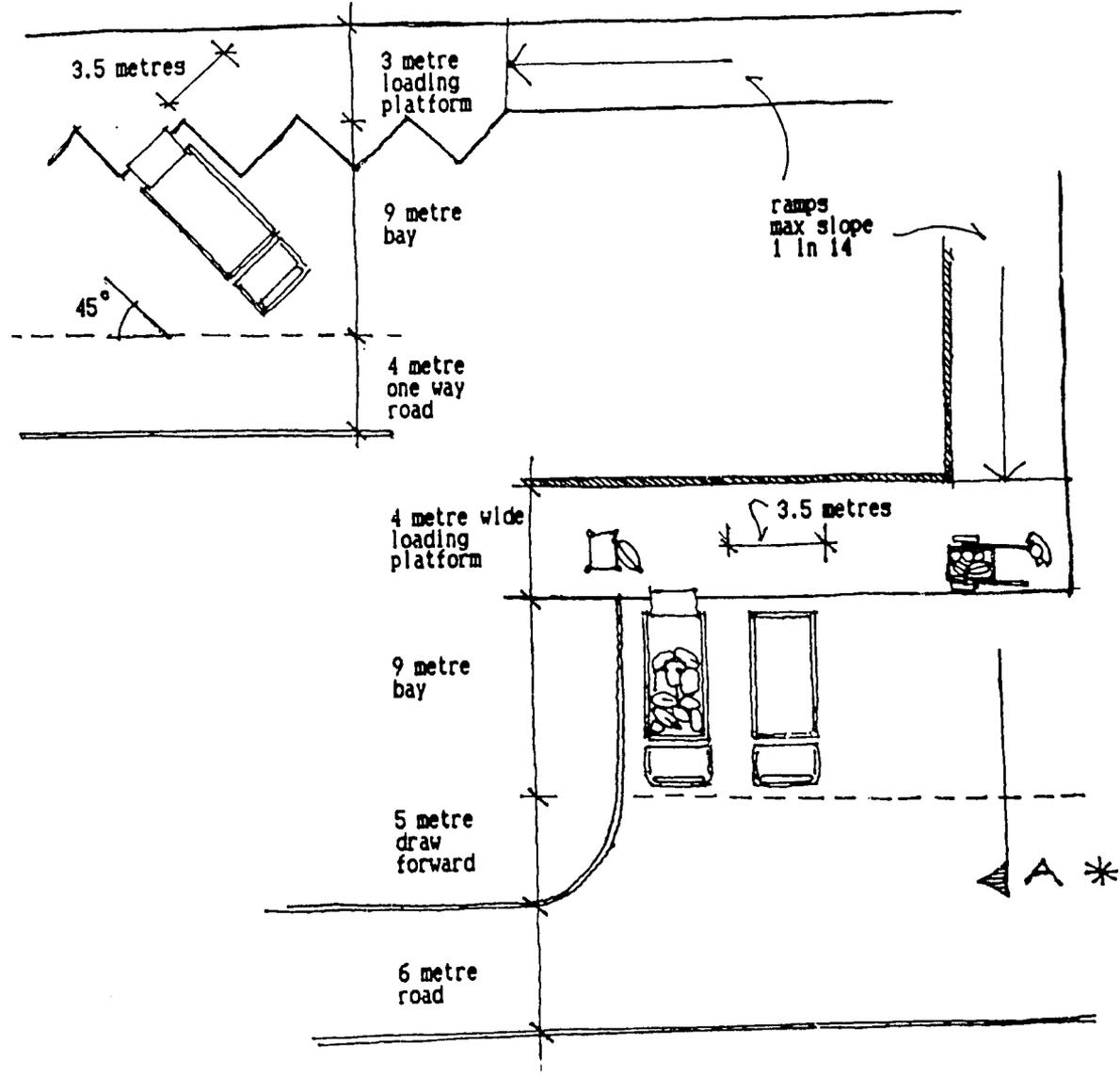
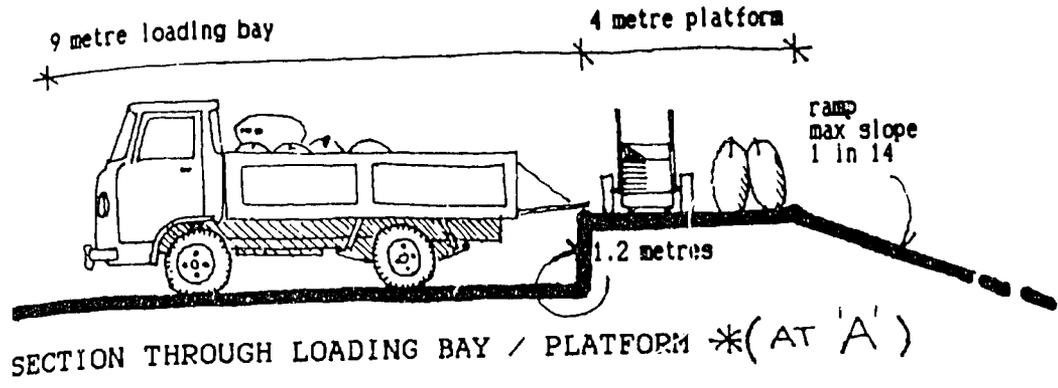
* PASSENGER VEHICLES For the foreseeable future, the majority of market users in small towns will arrive and depart either on foot or by public transport. Parking is unlikely to be a problem. If there are parking spaces on the roads around the site then no additional provision need be made. However, if parking is difficult in that area then 4 or 5 spaces should be sufficient.

* GOODS DELIVERIES The site will need a delivery access because farmers and co-operatives may well be bringing large volumes of produce to the market.

WAITING AREAS These deliveries are normally early in the morning, but as the vehicles may travel a considerable distance they may arrive in the middle of the night. An area needs to be kept clear for parking these vehicles until the market opens.

LOADING / UNLOADING ... Trucks should be able to back up to an unloading ramp or bay which should be 1.2 metres high. Details of how this can be arranged are given in the diagrams on the next page, page 34.

1.4 LOADING BAY ARRANGEMENTS



ALTERNATIVE LOADING BAY ARRANGEMENTS

2.0 SITE LAYOUT

The basic requirements of the site were discussed on page 31. There are an almost infinite number of possibilities for the arrangement of the layout of a market, but there are some critical factors, which, when applied to a site, will set up the basis for a sound design.

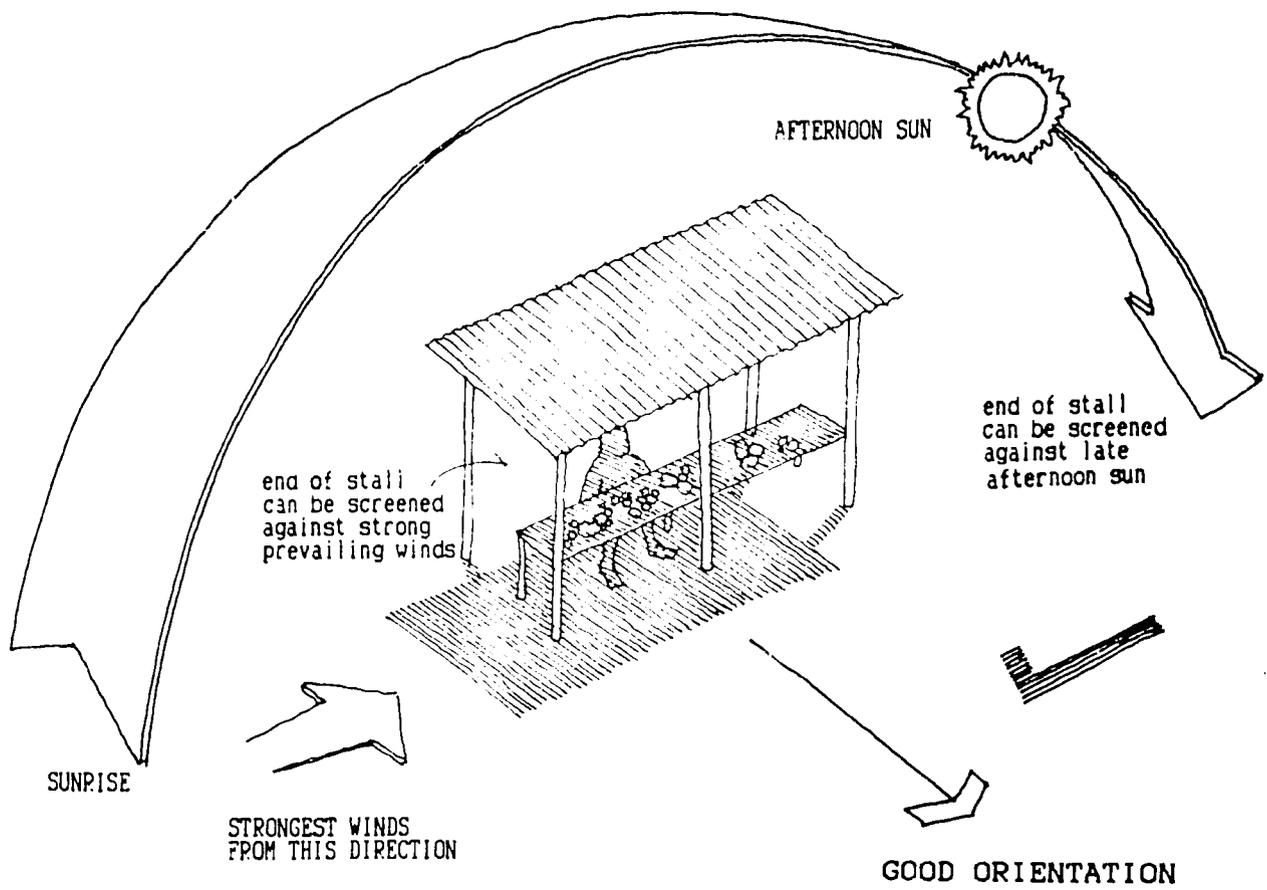
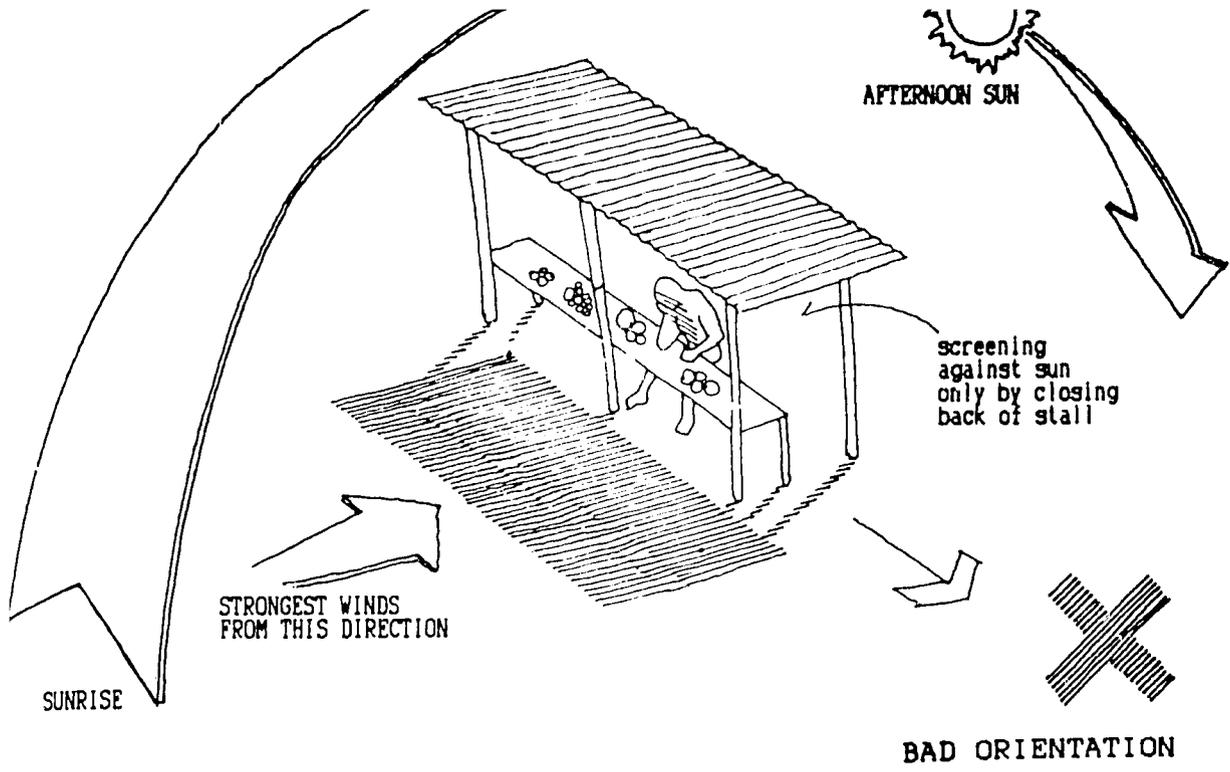
2.1 ORIENTATION

This is a critical factor which affects the market buildings.

- * AFTERNOON SUN The sun rises in the east and sets in the west. This means that during the late morning and for most of the afternoon the sun will shine deep into any buildings or shelters which face east or west. Buildings which face north and south, however, will have the minimum sunshine penetration. This is ideal because the sun is therefore not shining into or through the stalls or shops, for example, during the hottest parts of the day, and all the buildings are giving the maximum possible shelter to the occupants.
- * PREVAILING WINDS In addition the prevailing winds in Kenya are almost always from the north east or south east. Although this is not nearly as important, during the windier periods of the year it does mean that the buildings will also provide better protection from the wind when they face north or south.

2.2 ORIENTATION DIAGRAMS

The influence of these factors is explored in the diagrams on the next page, page 37.



2.3 GENERAL ARRANGEMENT ON SITE

We have now studied access to the site and how the buildings should be orientated. Before moving on to the detailed planning of the site, we must look at the priorities in planning the site.

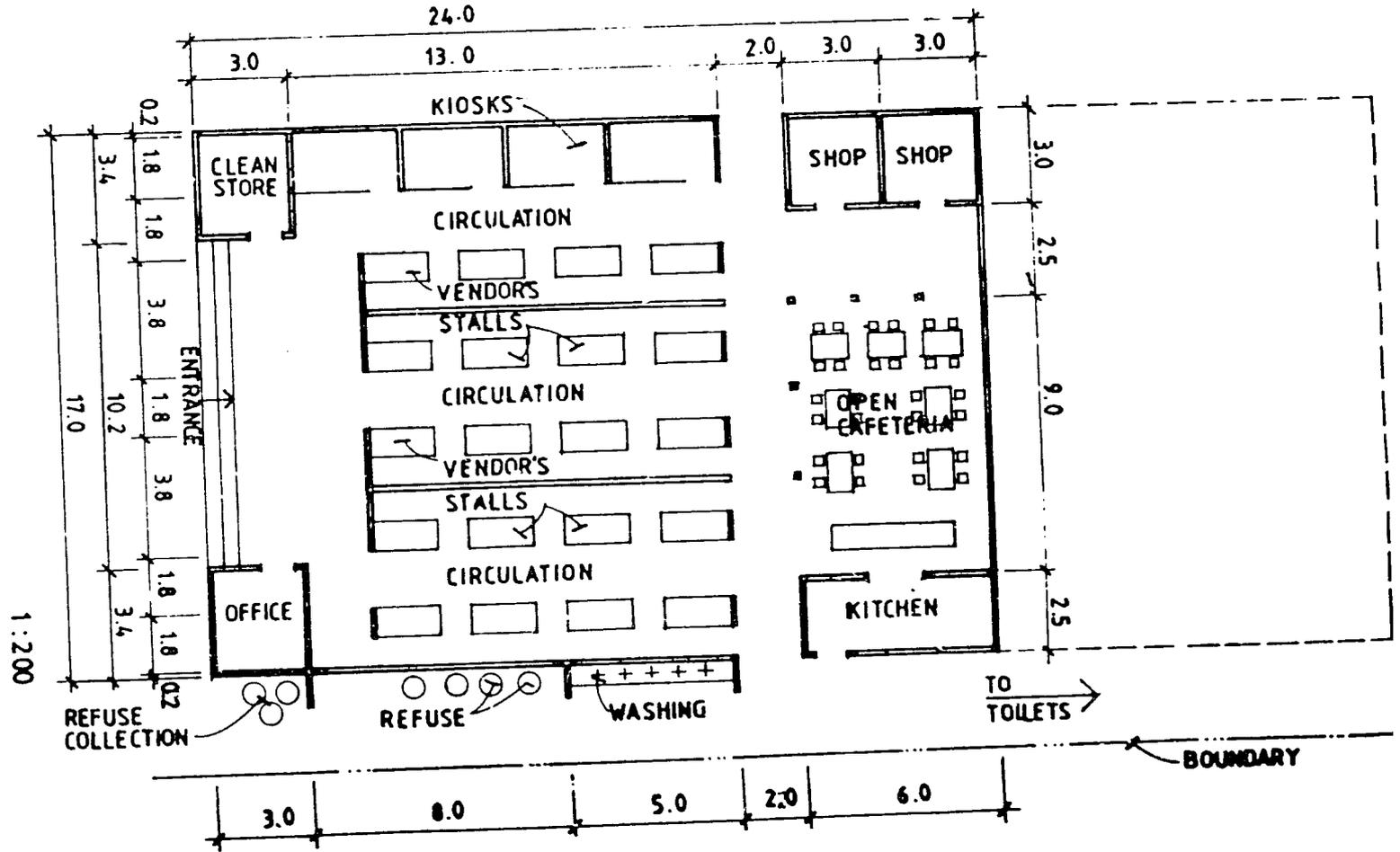
- * CIRCULATION A successful market should be compact and easy to move around in. On entering, the layout should be clear and, as far as possible, equal priority given to all areas. Poor circulation in one area will result in stalls in that area being unpopular and they could stand empty.
- * PEDESTRIANS ... People on foot need to have easy access to all the facilities on the site. As a market is a predominantly pedestrian facility, vehicle movement is unlikely to be a problem. However, the lines of movement of vehicles and pedestrians should be kept separate, or, in other words, vehicles should be kept out of the market.
- * FACILITIES With the exception of the public toilets, all the facilities need to be grouped together. A prospective buyer should be able to see and have access to all the different types of goods in the market all the time. Separate halls for different goods will not be successful. The only exception to this is the separation of wholesale and retail areas.
- * PUBLIC TOILETS For privacy and hygiene the public toilets should be set apart from the rest of the facilities, particularly as markets are largely involved with food. Since the prevailing winds are from the east, the risk of offensive smells across the market can be avoided by positioning the toilets on the western side. However, some attention should be given to what surrounds the market as this may well influence the location of the toilets as well.

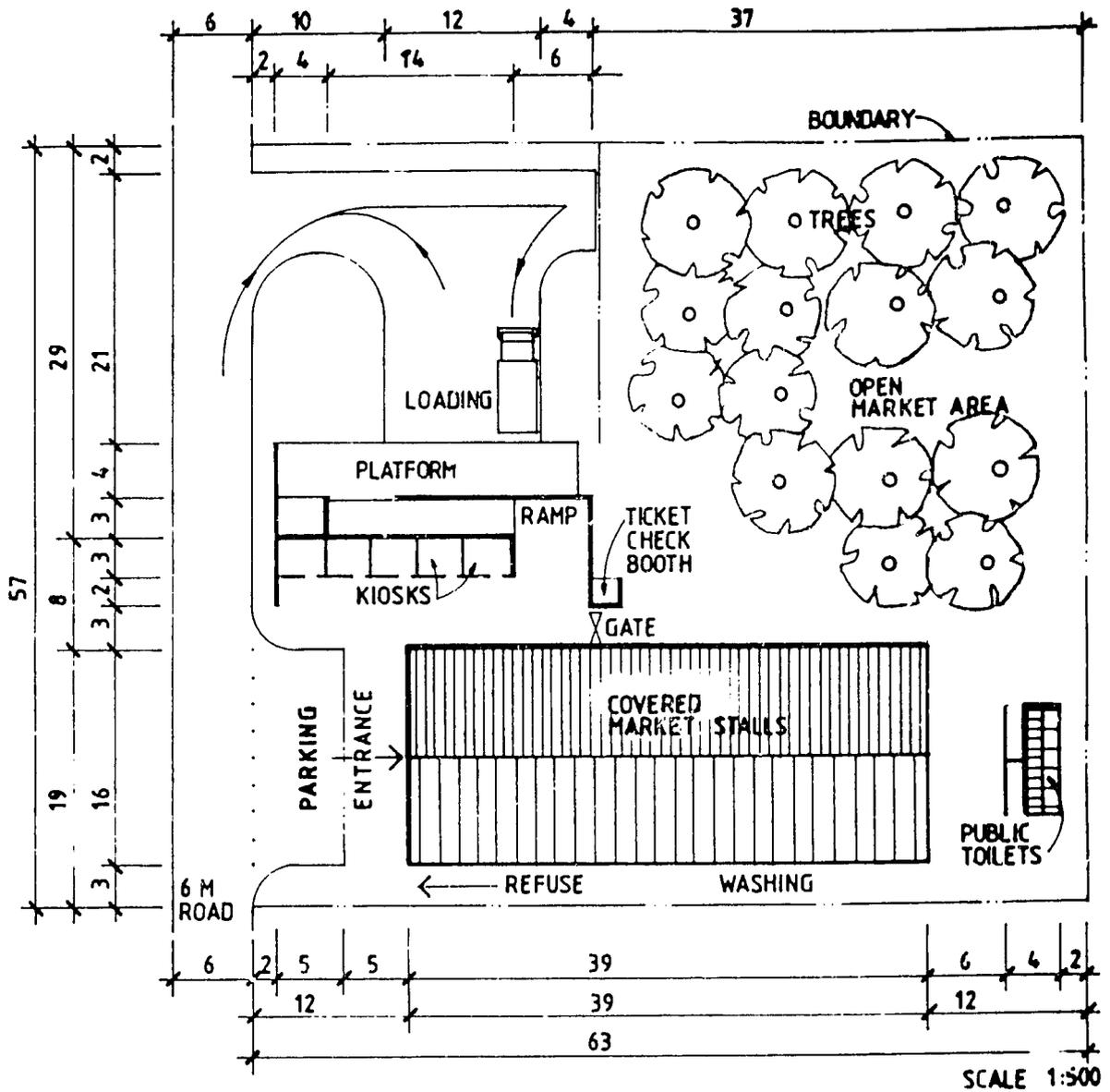
2.4 GENERAL ARRANGEMENT DIAGRAMS

The diagrams which follow on pages 40 to 42 show some model layouts to give an idea of good general arrangements.

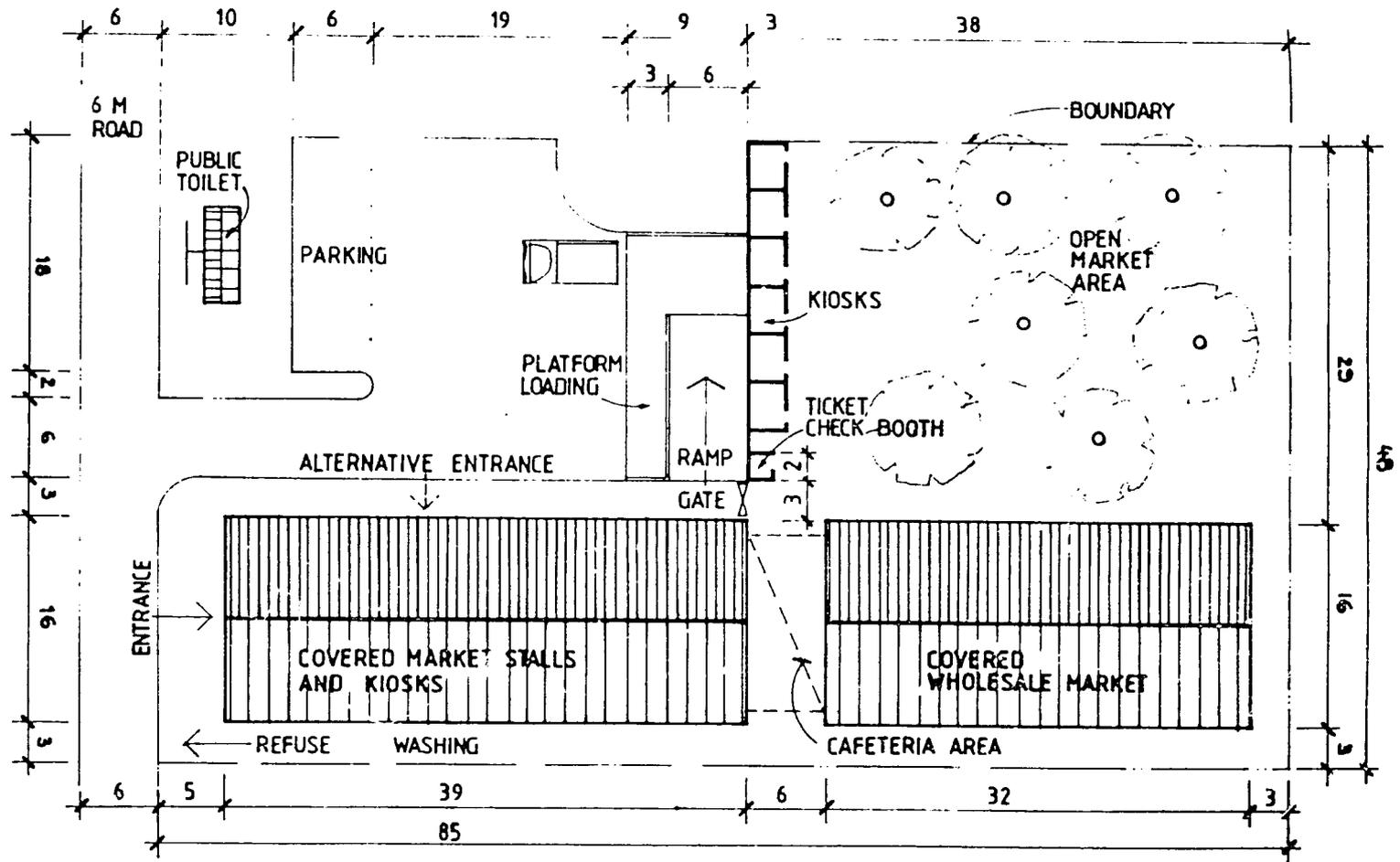
LAYOUT - COVERED RETAIL MARKET

40





SITE LAYOUT - RETAIL MARKET WITH OPEN-AIR MARKET



SCALE 1 : 500

SITE LAYOUT - RETAIL, WHOLESALE AND OPEN AIR MARKETS ON ONE SITE

SECTION THREE --- DESIGN

CONTENTS	PAGE
1. DETAILED PLANNING	
1.1 circulation	45
1.2 selling areas	46
1.3 stalls diagrams	47
1.4 roofs / shelter	49
1.5 roof designs	50
1.6 shelter diagrams	52
1.7 administrative areas	54
1.8 office diagram	55
1.9 washing area	56
1.10 washing area diagrams	57
1.11 tea rooms and cafeterias	58
1.12 tea room diagram	61
1.13 kiosks and shops	62
1.14 kiosk diagram	64
1.15 refuse disposal	65
1.16 refuse bin diagram	66
1.17 storm water drains	67
1.18 storm water drain diagrams	70
1.19 public toilets	71
1.20 public toilet diagrams	75
1.21 signs	76
1.22 signs checklist	78
1.23 fencing	79
1.24 lighting	79
1.25 landscaping	79

SECTION THREE --- DESIGN

1.0 DETAILED PLANNING

Now that we have set up the framework for the layout of the market, we are in a position to start the detailed planning. In this section we look, in turn, at each of the components that make up the market.

There are three types of marketing, each of which has to be considered separately because of differing design requirements:

- * RETAIL ... The retail market sells usually small quantities of goods to the general public, having first bought them from a farmer or wholesaler. The market area is usually covered and made up of small stalls.
- * WHOLESALE The wholesale market is usually made up of farmers or co-operatives selling goods in bulk, or comparatively large quantities. The area may often be left uncovered and usually does not have any stalls.
- * OPEN-AIR The open-air market is a less developed form of the retail or wholesale market, and is usually made up of a mixture of the two types. Any stalls that are built will be self-built by the stall-holders. The rest of the goods will be laid out on the ground.

Remember that the orientation of all the structures mentioned in this section is important for their success, and details of that are in the previous section. Wherever no mention is made of this in the following descriptions, it is because it is assumed that the general orientation guidelines given above are applicable.

1.1 CIRCULATION

- * ENTRY .. As the market will cover a fairly large area it is important to make the entrance clearly visible, and as convenient as possible from the surrounding town. There should only be one entrance for the public and one entrance for deliveries. They should not be near each other and should have good secure gates.
- * CUSTOMERS Circulation around the market is one of the keys to success. The most popular stalls or areas will be those nearest to the public entrance because they get the maximum exposure. The market should be laid out in an open way so that prospective buyers can find what they need easily. The layout system should also be clear and simple. Using rows or a grid will be found to be best.
- * RETAIL GOODS The general retail trade deals in fairly small quantities of many types of goods. In the cases of the shops and durable goods stalls these may be permanent displays which just require some additional items brought in from time to time. Hand carrying or small trolleys for these is all that is required. The fruit and vegetable stalls may involve more goods, but these are generally hand carried also.
- * WHOLESALE GOODS ... Markets often have wholesale areas. The retailers may well buy off the wholesalers to sell small amounts retail. Deliveries of wholesale goods will generally require handcarts. The provision of a raised delivery bay will prevent a lot of damage to produce.

1.2 SELLING AREAS

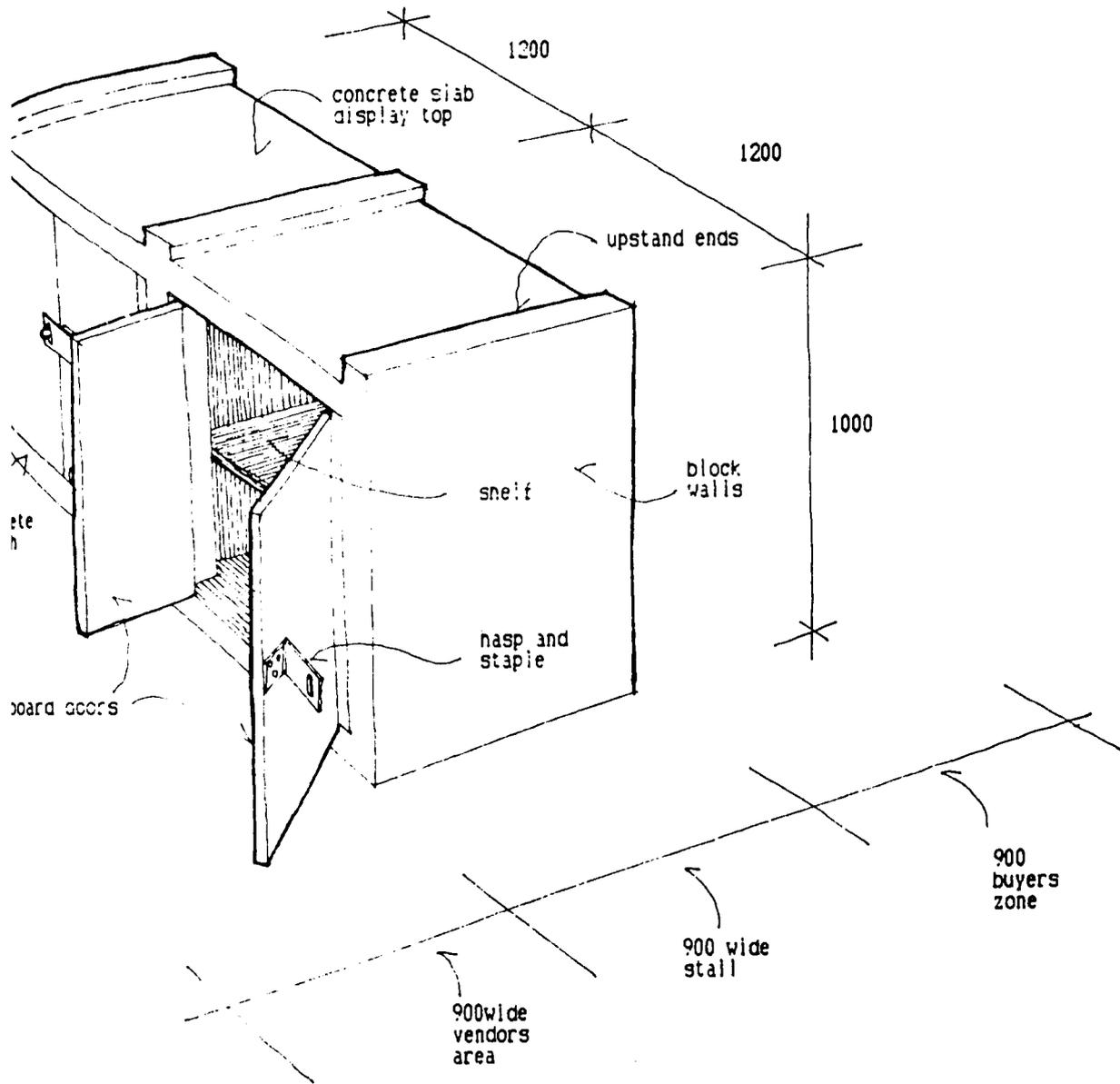
The needs of the different selling areas of the market are reflected in the different designs of the stalls.

- * **RETAIL STALLS** A good market stall for a retail vendor is the same height as a low shop counter, that is 0.9 metres, has a concrete slab top on blockwork walls and a lockable cupboard underneath. Stalls should be kept small so that the rental can be kept to a minimum. If vendors require more space then they can take two or more stalls.

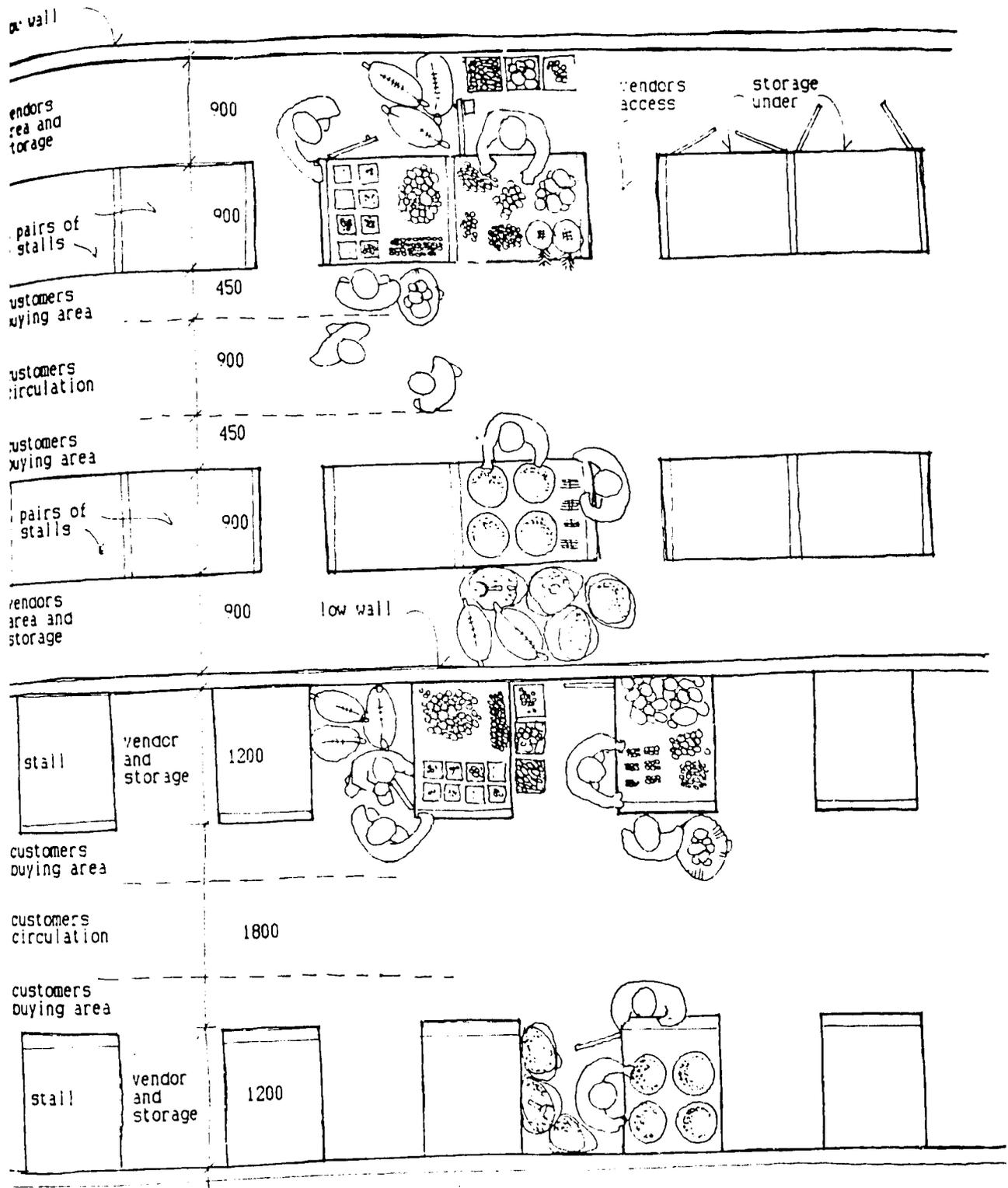
A good stall size would be 1.2 x 0.9 metres. The vendor should be given the same amount of space beside his stall to store additional goods and from which to serve his customers. Another equal area next to the stall should be provided on the customers side for circulation and standing while buying. Different ways of doing this are shown in the diagrams on pages 47 and 48.

- * **WHOLESALE** The wholesale area has to be treated in a totally different way from the retail area. It is quite common in wholesale areas to find a smallholder selling a single debe of, say, tomatoes next to a farmer selling several sacks of, say, potatoes. Whether the area is covered or not, the best way of dealing with this range is to simply allow the wholesalers to take up the required floor or ground space. This will need to be marked out for selling areas and circulation. See also the comments on page 92.
- * **OPEN-AIR STALLS** These are usually built by the vendors. As we noted on page 44 there may well be a mixture of wholesale and retail sales being carried out. The balance between these two types will dictate the balance of stall types, and the only requirement would be for sufficient space. This balance should be clear from the survey.

STALLS DIAGRAMS



EW OF PAIR OF STALLS



PLANS OF TWO ALTERNATIVE
 TYPES OF STALL LAYOUT
 FOR DIFFERENT MARKETS

1.4 ROOFS / SHELTER

By their nature open-air markets do not have roofs. If they are within built-up urban areas, are walled in or have trees planted around and within them, then they will offer a degree of shelter.

This is a cheap and fairly common form of market and in drier areas is likely to be all that is required. With a number of trees providing shade this can be a successful form of market.

Perishable goods do, however, deteriorate very quickly when exposed to moisture, heat or bright light, particularly in sunlight or rain.

All perishable goods areas of the market should therefore preferably be sheltered from sun and rain. In dusty or windy areas a wall provides shelter from dust as well, and this is important. The relatively dark and cool environment provided in a traditional covered market is, in fact, ideal.

- * RETAIL AREAS It follows that retail areas should have a permanent roof construction. As the areas to be covered are large, some form of lightweight sheeting is an obvious choice. Concrete roofs have been used, and attractive spaces created with them, but they cannot be justified on grounds of cost.
- * WHOLESALE AREAS .. In many markets the wholesale areas are not covered. If funds and economic feasibility permit, a roof over an otherwise open floor area makes a very useful space and will increase the popularity of the market with both the vendors and public. An alternative would be to use trees for shade. This could be upgraded by providing paving to cut out dust, though this will still not resolve the problem of rain.

1.5 ROOF DESIGNS

Roofs are the most important aspect of a covered market and, while planning the market, the way it will be roofed should be a prime consideration.

The guidance given on stall sizes and circulation spaces gives rise to a basic design module or bay arrangement of 5.5 or 6 metres which includes 2 rows of stalls, circulation between them and vendor space behind. This is an economical grid for most structural materials. How this arises is shown in the diagrams on pages 52 and 53.

The principle choice is between either a single roof that covers the whole area or a series of smaller roofs covering parts of the market with uncovered areas between these roofs.

These two choices of roof type are discussed below:

- * A SINGLE ROOF ... This provides the most compact and trouble free solution. The entire space under the roof is useful and planning is at its most flexible both at the design stages and in use. A possible disadvantage is that the roof will be larger and will require more careful structural design. It is not essential that the entire area be free of columns so the structure need not necessarily be more expensive. Orientation is also much less important with single rather than multiple roofs.

- * **MULTIPLE ROOFS** .. If multiple roofs are required then the optimum width of roof needs to be matched against the stall sizes, including allowances for generous overhangs. The most economical way of doing this is for each roof to cover 2 rows of stalls with the pedestrian circulation between them. This also gives a 5.5 to 6 metres span as a basic module.

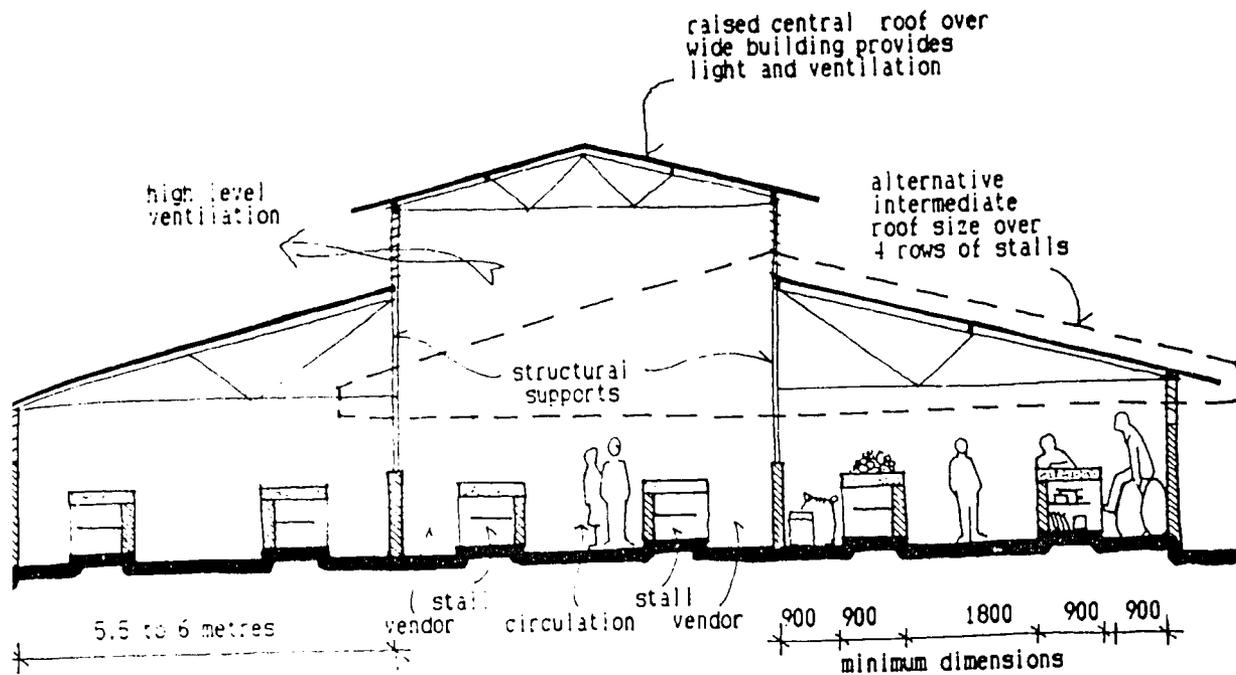
The overhangs should be sufficient to keep rain and sun off the stall, the vendor, his stores and prospective buyers moving around the circulation areas. The unroofed spaces can be kept to a minimum and used as a service area for movement of sales goods.

The minimum height at the edges of these roofs should be 2.1 metres. The angle of sun and wind-blown rain, taken as about 65 degrees from the horizontal, requires an overhang of at least 0.6 metres beyond the required covered area.

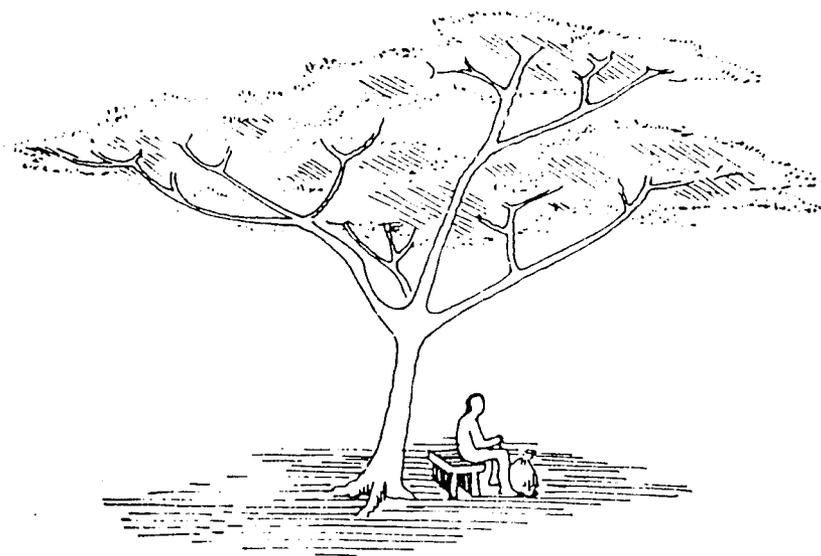
The uncovered areas between the roofs should not be considered as part of the usable market space. They should contain large drains to collect rain water. However, people will cross these areas so there should not be any barriers to pedestrian movement, or any obstructions that will restrict the view of the rest of the market.

- * **OVERHANGS**Roof designs should provide for an overhang of between 0.6 and 1.0 metres all around the building. If the overhang is all to the outside of the market, gutters and downpipes are unnecessary. If, however, an overhang is within the market area, gutters and downpipes are essential.

6 SHELTER DIAGRAMS



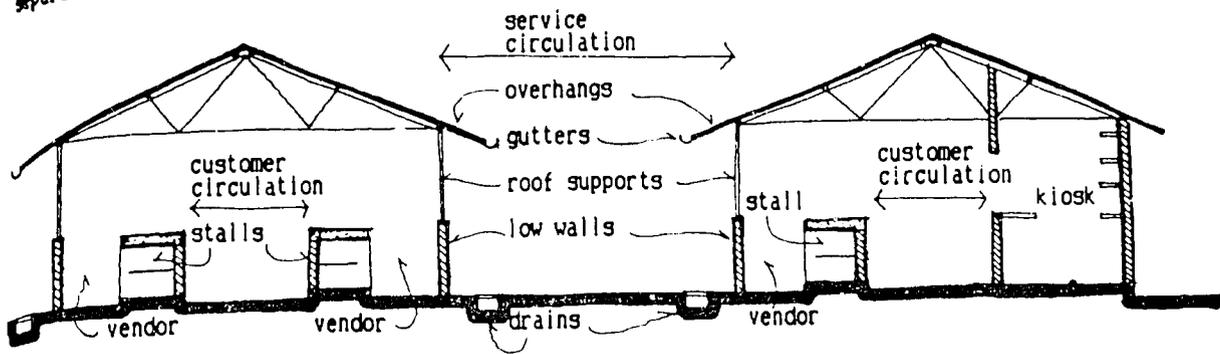
ALTERNATIVE SINGLE ROOF ARRANGEMENTS



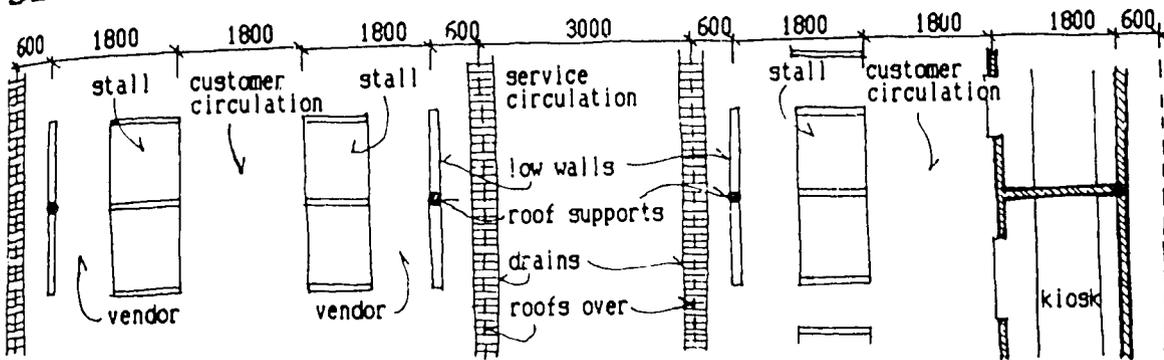
A CHEAP AND DURABLE FORM OF SHELTER

ALTERNATIVE ARRANGEMENTS FOR STALLS UNDER MULTIPLE ROOFS

OPTION 1: Customers circulation under the centre of each roof, with vendors having direct access to service circulation in open areas between roofs. This allows better protection for customers and separates service and customers circulation

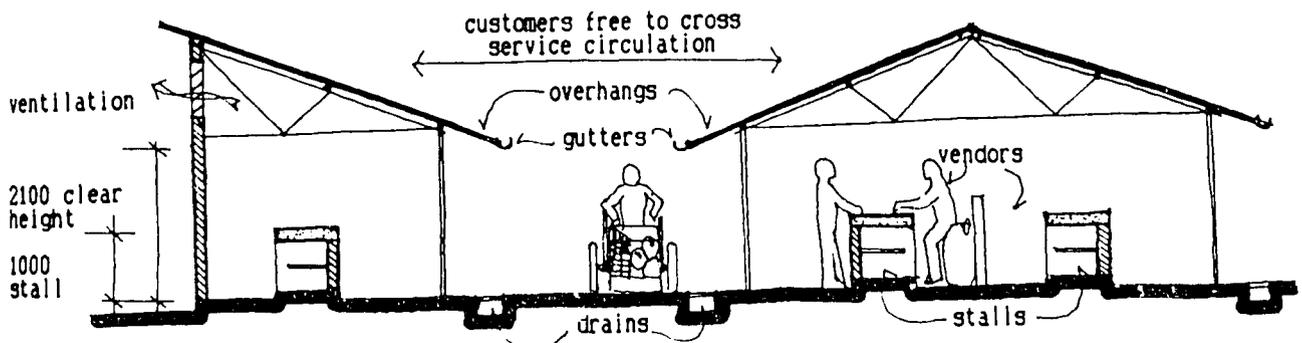


SECTION - OPTION 1

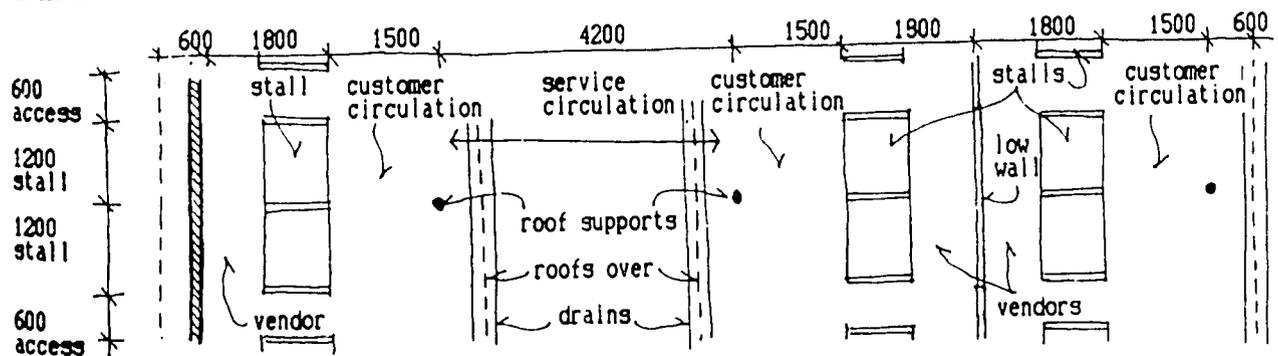


PLAN - OPTION 1

OPTION 2: Vendors and their storage under the centre of each roof, with the customers and service circulation mixed around the open areas. This allows more freedom of movement for the customers but does have mixed circulation



SECTION - OPTION 2



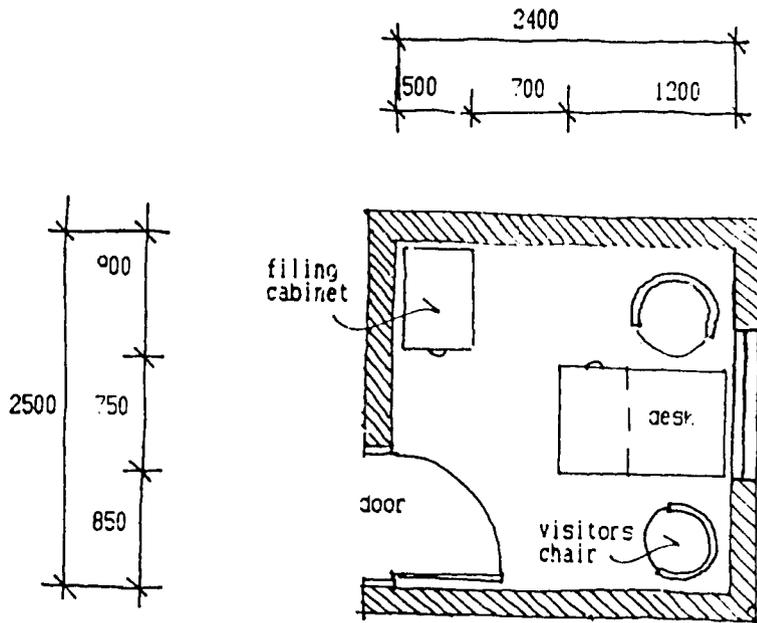
PLAN - OPTION 2

1.7 ADMINISTRATIVE AREAS

Most types of market will require an office. The diagram on page 55 shows how the space described below can be set out.

- * SIZES .. An office should have a minimum area of 6.5 square metres, that is 2.5 x 2.5 metres, or allow 3.5 square metres minimum per occupant. A common room for cleaning staff should allow a minimum of 1.5 square metres for each expected occupant.
- * TOILETS If there are any staff working full time at the market then a staff toilet should be provided. This may be connected to the public toilets but should be lockable. The number of toilets will depend on the staff but a minimum of 1 toilet and basin for every 15 staff members is a good guide.
- * STORES ... Cleaners should have a store room for their equipment and this will need a low sink with its top level at 0.4 metres and with a tap at 0.8 metres. This allows a cleaning bucket to be put on a grate over the sink and is not too high for the cleaner to lift away a full bucket of water.

8 OFFICE DIAGRAMS



MINIMUM OFFICE LAYOUT

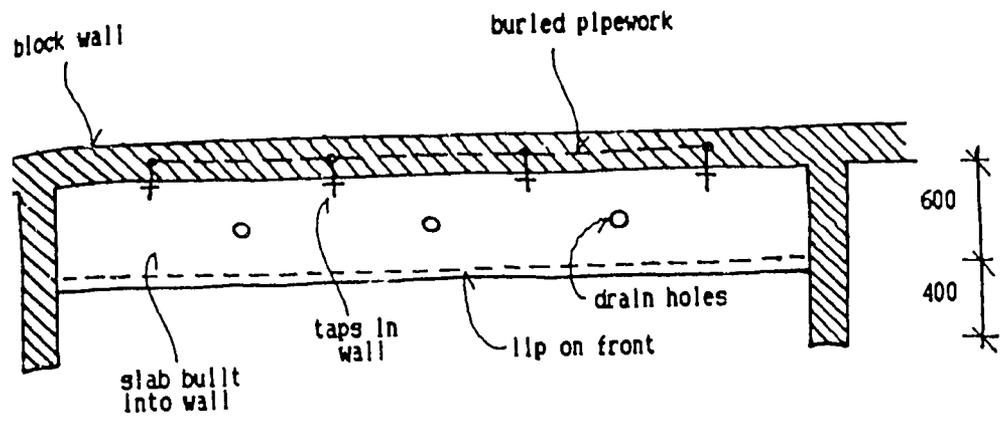
1.9 WASHING AREA

It is common for vendors selling relatively small amounts of fresh produce to want to wash some of the goods before display.

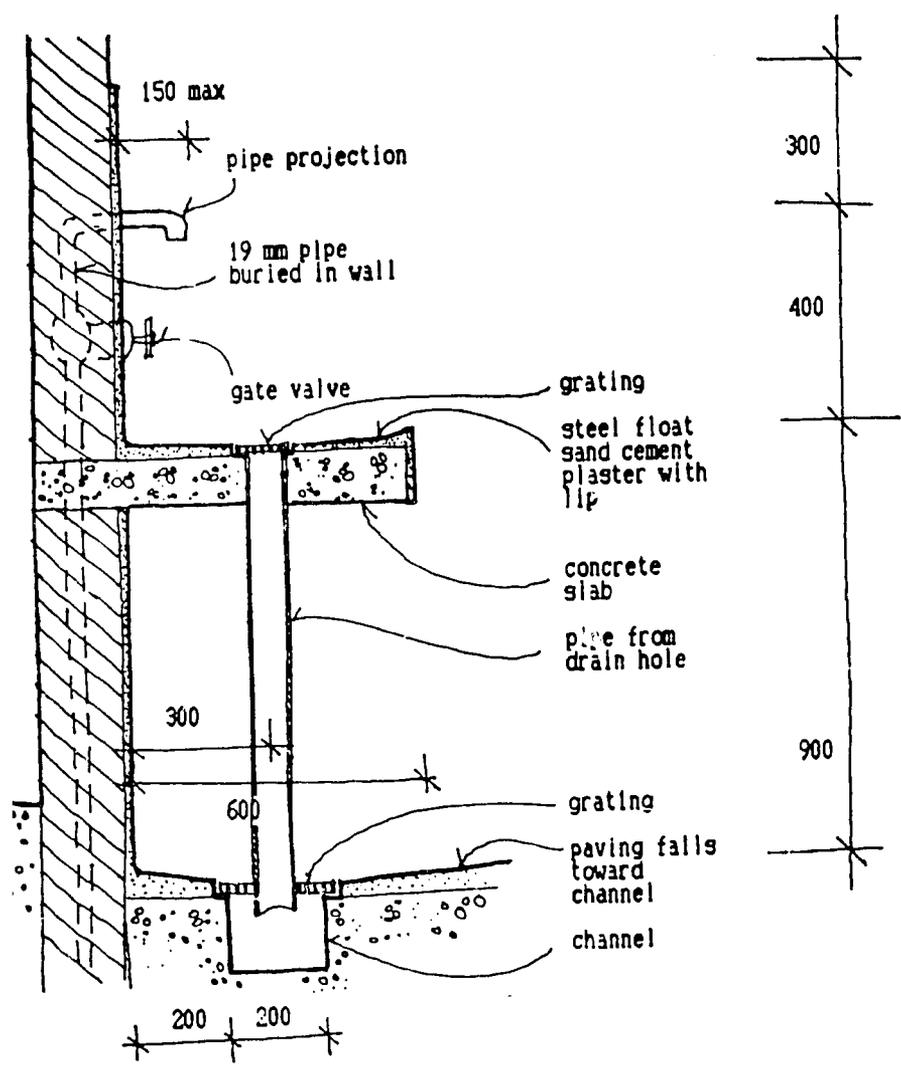
- * LOCATION An area away from the toilets and the main public circulation areas should be supplied with water and a drain as a produce washing area.
- * COVERED MARKETS ... The washing area should have a long counter, 0.5 metre deep, 1 metre high and with taps above it. Under the counter there should be a drain channel to collect the water. The channel should be covered with a grating to prevent discarded bits of produce from blocking the drains. The most convenient arrangement for this is to build the washing area against an appropriate length of wall.
- * OPEN-AIR MARKETS As these will not usually have an appropriate length of wall, either one has to be built or a concrete base and standpipe should be provided.
- * PIPEWORK ... In either case it is essential that the pipework is well supported. This means building it into the wall, if there is one, or attaching it to a 75 x 75 mm steel angle, one end of which must be buried at least 0.6 metres into the ground.
- * TAPS / VALVES .. The problem with taps in public use is that the heads are tightened too much too often and the seating washers wear out too quickly. Either the Council has to be prepared to replace these washers often, or they should use gate valves instead of taps. Gate valves can be fixed into the wall (or onto the steel angle support) and have a simple pipe spout arrangement (very much like a shower).

Details of these suggestions are shown in the diagrams on the next page, page 57.

WASHING AREA DIAGRAMS



CROSS SECTION



CROSS SECTION

1.11 TEA ROOMS AND CAFETERIAS

Although these two facilities provide very much the same service - hot refreshments - they are quite different in character and need to be treated in different ways. Tea rooms provide the cheapest possible refreshments without any extras and thereby appeal to the broadest range of users, and are typically tenant built. The cafeteria attempts to provide a wider range of refreshments of a slightly more sophisticated nature in more comfortable surroundings, and are likely to be an integral part of the market.

TEA ROOMS are essential because they are a very popular facility and so provide an important service to the public passing through the market.

- * CONSTRUCTION In order to be successful the rental must be kept low because an acceptable price for a cup of tea is virtually fixed. This tends to mean such facilities are best built by the prospective owner on rented space and not by the Council. Care must be taken to ensure that the Council has the right of eviction in cases of non-payment.
- * LOCATION .. The question of the provision of tea rooms only really arises in connection with wholesale or open-air markets. The location within the market is very much open to choice, but they will be more popular and successful if they can look out over the activity of the market.
- * SIZE AND NUMBER .. Tea rooms are generally about 4 metres wide and 7 metres long, so a plot size of 6 x 10 metres should be adequate. Estimating the number of tea rooms that are likely to be required is difficult because their popularity varies in different areas of the country. As a guide, a tea room for every 40 stalls in the market will be sufficient.

* SANITATION For public health reasons, adequate sanitation must be provided for the tea room and must include toilet, washing and washing-up facilities.

STAFF TOILET This should be provided, including a water supply and drains. If this makes the construction of the tea room too expensive for it to be profitable the public toilets could be used instead.

WASHING Whether a toilet is provided or not, some form of staff hand-washing facility is essential. This could be a basin, but a stand-pipe is more likely to be successful.

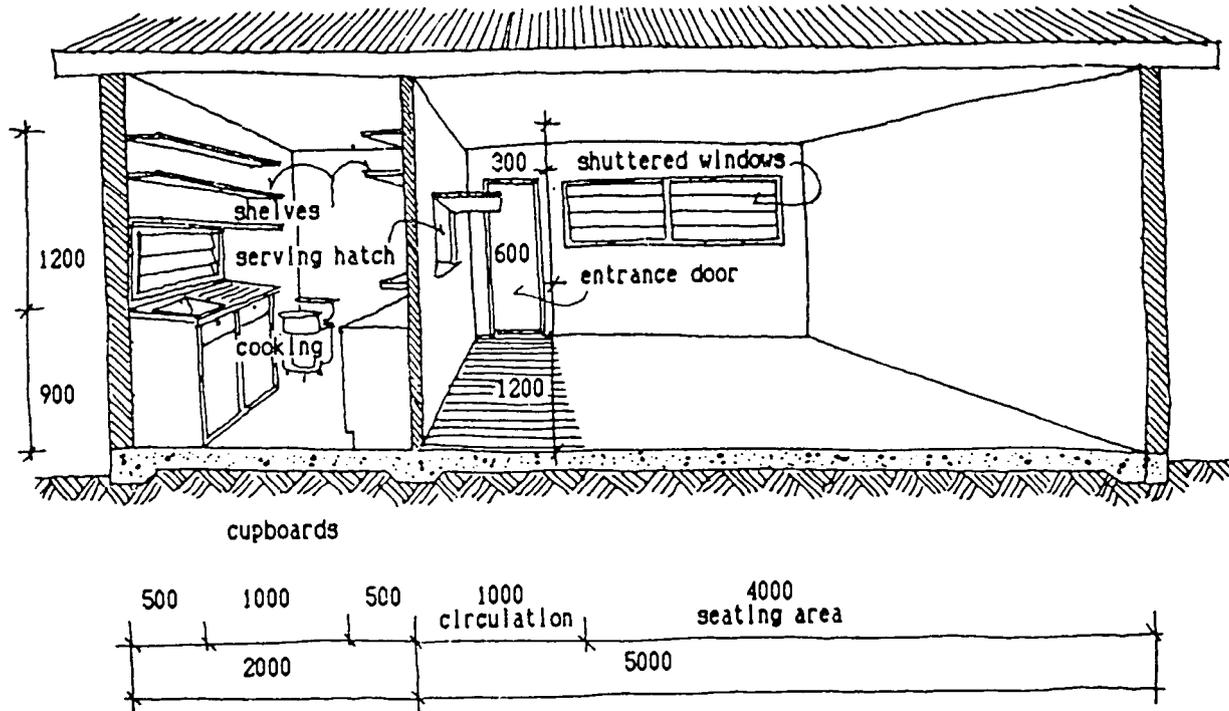
WASHING UP Will have to take place, and to be hygienic it requires hot water. As charcoal or paraffin stoves are the most common form of heating used in tea rooms, and a fixed water heater is unlikely to be practicable, water heated in a bowl is the most likely compromise. In order to try and ensure that hot water is used, the Council should make sure that some provision, in the lease (or licence) for the tea room, is made insisting that the issue of the lease (or licence) is conditional upon the use of hot water for washing-up.

CAFETERIAS, appealing to a more limited range of customers, are more speculative. Some towns have them and some do not.

- * CONSTRUCTION .. If the Council is going to build a cafeteria they need to be sure they have a potential tenant, have a good idea how large it should be and what facilities it should contain to prepare what will eventually be for sale. This is difficult to estimate and will vary a great deal. On the other hand, the provision of a cafeteria will probably bring in more income and improve the facilities of the market. It may also help avoid the need for tea rooms in situations where they are considered to be undesirable.
- * LOCATION This is again open to choice. As a better quality facility, there are even less constraints on this than on the tea rooms. The cafeteria will probably also be more popular if it looks out over the market areas.
- * SIZE As there is only likely to be one cafeteria in a market, the size is far more variable and depends on the size of the market itself. As a guide, the cafeteria should provide 1 seat for every 10 vendors in the market, when it is at its busiest.
- * SANITATION ... The cafeteria should have its own toilets for the staff and for the public. For every 15 seats in the cafeteria there should be a toilet cubicle or a urinal and a hand wash basin, and the number of facilities equally divided between men and women.
- * KITCHENS The kitchen area of the cafeteria is the most difficult to estimate because it will depend entirely on the range of goods to be sold. However, when planning for a kitchen area, an allowance of 20% of the seating area should be adequate for most needs. If a tenant can be identified at an early stage then it would be wise to check this with them.

CUTAWAY VIEW THROUGH SIDE OF TEA ROOM

1.12 TEA ROOM DIAGRAMS



1.13 KIOSKS AND SHOPS

In covered markets there will generally be a need for small shops, and this has already been discussed on page 12. Kiosks, on the other hand are generally associated with wholesale and open-air markets because of the lack of any permanent structure to accommodate them. In fact they serve the same purpose and have the same design requirements but have obvious differences in construction.

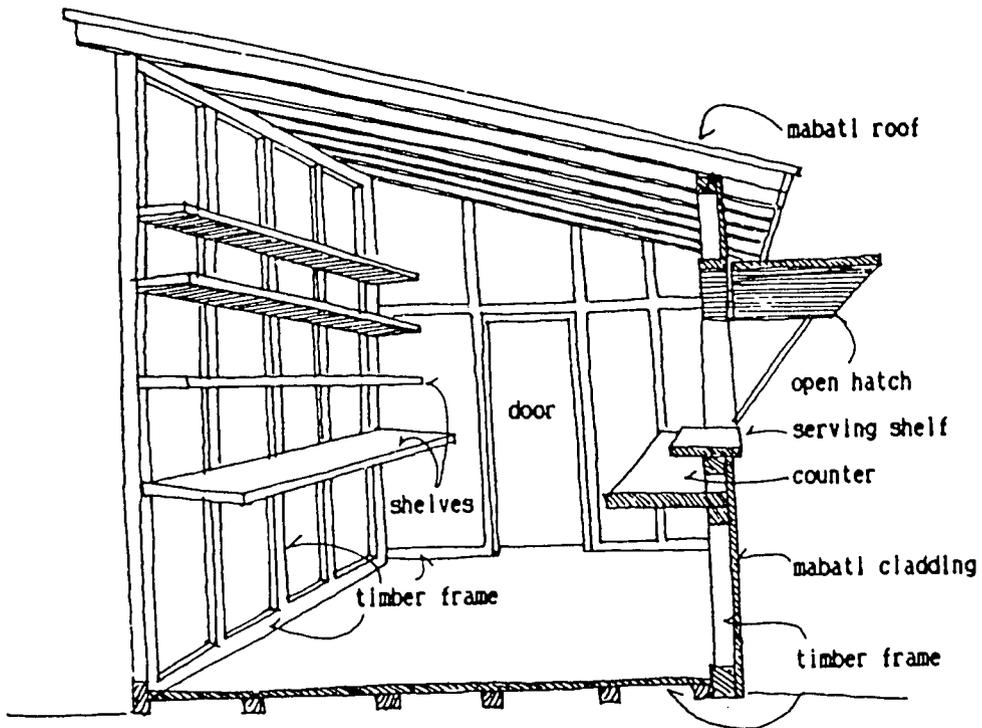
To avoid unnecessary repetition in this section, it is assumed that when reference is made to kiosks it is referring to both kiosks and shops.

Kiosks are very simple in design and do not require any water supplies or drains. They will compete with the tea rooms for the sale of refreshments, but only selling soft drinks, sweets and cakes. The important features of a kiosk are discussed below and there is a diagram on page 64.

- * LOCATION ... Kiosks should be close to the sales areas but about 3 metres should be left in front of the kiosks, to avoid obstruction around the stalls areas.
- * SIZE AND NUMBER A kiosk is about 3 metres wide and 4 metres long. This may well vary, but since the unit is so small it is relatively easy for the Council to deal in multiples of the basic unit. A minimum space allowance should be made for 4 kiosks in an open market, plus 2 more kiosks for each proposed tea room. The number of shops which may be required has already been discussed on page 12.
- * ORIENTATION This is not so important for a kiosk because it has an outward opening hatch which will provide the necessary shade for the occupants.

- * COUNTER The counter is across the front of the kiosk and just behind the hatch. This should be 0.6 metres wide and 1.1 metres high. The space under the counter is used for storage. A single drawer under the counter should be provided. The working space behind the counter should be 1 metre wide.
- * SHELVING A bottom shelf is required at 0.8 metres high and 0.4 metres wide. Upper shelves, starting 0.4 metres higher, should be 0.3 metres wide and spaced at 0.3 metres vertically. The space under the bottom shelf is also used for storage.
- * BUTCHERIES Some markets will have a small butchery, which will have different requirements from other shops or kiosks. These will all relate to sanitation and public health and will be dictated by the Council's Public Health Officer and by-laws.

1.14 KIOSK DIAGRAM



CUTAWAY VIEW THROUGH SIDE OF KIOSK

1.15 REFUSE DISPOSAL

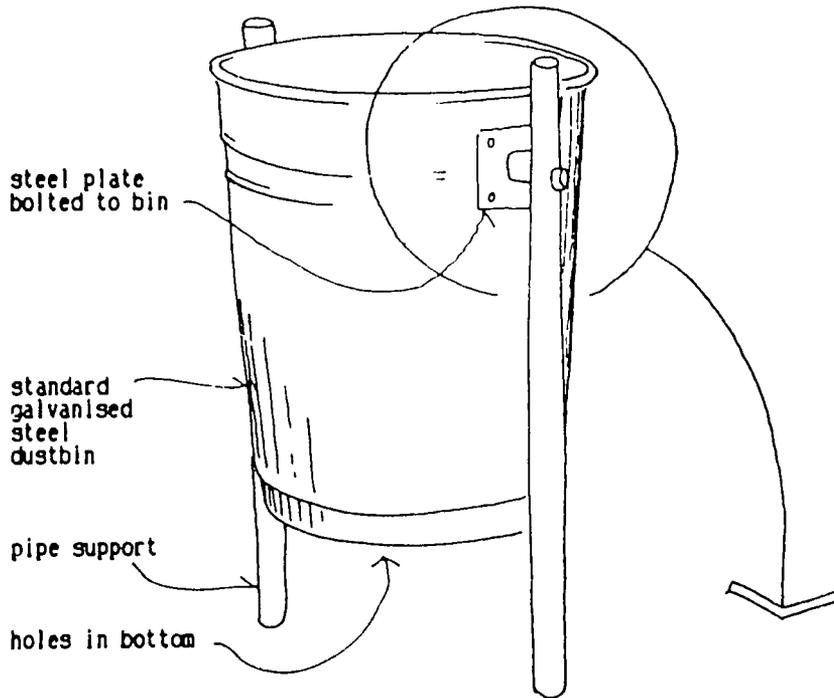
Markets always generate large quantities of rubbish which have to be disposed of. For successful refuse disposal, the following rules must be followed .

- * COLLECTION BINS Refuse collection bins must be positioned at regular intervals among the stalls and by kiosks and tea rooms. The greater the number of bins, the greater the likelihood that they will be used.
- * CLEANING STAFF No matter how many bins are provided, there are many people who will not use them. A full time cleaning staff should be employed to sweep up and keep putting the refuse in the bins.
- * BIN DESIGN If the bins are too small they will fill up too quickly, and if they are too large they will be very difficult to handle. The best size and type of collection bin is the domestic galvanised steel bin. This design needs modifying in two ways, which are also shown in the diagrams on page 66.

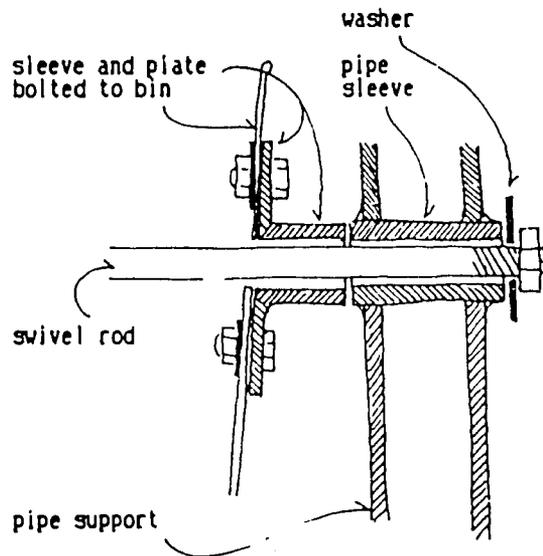
SWIVEL .. If the bin is fixed onto galvanised steel posts by a galvanised steel rod about 150 mm from the top so that it swivels, it cannot be overturned by dogs scavenging and does not then need a cover. However, the bin can be tipped over for emptying into another bin when the refuse is collected by the Council.

DRAINING As decomposing fruit is acidic and will corrode the bottom of the bin, it is important to keep the contents of the bin as dry as possible to reduce this corrosive action to the minimum. Several holes punched in the bottom of the bin will ensure that rainwater or any other liquids can quickly drain away. Frequent emptying and regular washing out will also help.

1.16 REFUSE BIN DIAGRAM



DETAIL OF FIXING OF BIN TO SUPPORT



1.17 STORM WATER DRAINS

This is a specialist subject and detailed designs should be carried out by an engineer. The notes that follow are intended only as a guide to help the designer ensure that the correct principles are followed from the early stages of the design, and to help check designs when submitted for approval.

- * **STORM WATER RUN-OFF** During periods of heavy rainfall most of the water which falls onto the ground cannot soak into the ground and so either runs off downhill, where it can, or collects in pools, where it cannot. This problem is generally worse in towns because a large proportion of the area is either buildings or hard surfaces which will not allow any water to soak in. The objective of storm water drainage is to collect and control this run-off before it can do any damage.
- * **CUT-OFF DRAINS** .. Very often a major storm water run-off problem is created by poor drainage around the market and results in large volumes of water rushing onto open market areas from the surrounding ground. To prevent this it is essential to provide large storm water drains across the upper sides of the site as cut-off drains. The size of these drains should vary according to the catchment area above them.
- * **ROOF DRAINAGE** All the water falling on the roof of the market will have to be disposed of. Undersized gutters often cause flooding into buildings during heavy rainfall. All gutters flood in heavy rainstorms because it is impractical to design gutters large enough even for a once a year storm. If the roofs slope inwards, when the gutters flood the water will flood into the market. So, if at all possible, roofs should be designed to avoid internal gutters.

* ON SITE COLLECTION Having diverted the run-off from the surrounding areas, we must ensure that all the run-off from the site is collected and disposed of. If possible any roads and paving should be sloped in the same direction as the site itself slopes. As far as possible they should also slope towards the outside of the market area. The run-off from these areas should then be collected in sufficiently large drains to cope with this quantity of water. It is often a good idea to use shallow channels across the open area to collect the run off. These do not require gratings and can be very cheaply constructed.

* SLOPES FOR DRAINAGE As a rule, paved areas should be sloped with a gradient of 1 in 50 to prevent areas collecting water in localized ponding. This is quite a steep gradient but does make allowance for the difficulties in setting out and constructing an evenly draining surface.

Slopes in the drains, however, can be kept as low as 1 in 400 because they can be constructed more accurately and localised ponding is not a serious problem.

* DISPOSAL OFF SITE There must also be somewhere for all these drains to lead to for final disposal. When beginning to set out the drainage on and around the site it is essential that the designer knows where and how the water will be disposed of. Lack of thought can cause serious problems for nearby plots, and the Council may have to consider taking the storm water drains a considerable distance to avoid such problems.

* DRAIN DETAILS It is preferable to use lined drains, but this is not essential. There are more important places to spend the money if a low cost is necessary.

* **DRAIN SIZING** The following data gives a guide for sizing these drains.

RAINFALL When considering the amount of rainfall to be allowed for in a particular situation, it is really only possible to deal with probable frequencies of storms of a particular intensity rather than certainties. The probable frequency will vary considerably all over the country. For the wetter parts of Kenya, a storm with an intensity of 75mm of rainfall in an hour and lasting more than half an hour will probably only occur once in fifty years. This would be acceptable as a design standard. To cater for this storm, the drains would be sized from the following formula;

Sectional area (sq.mm) = 13 x catchment area (sq.m)

This formula assumes that the drain will be approximately twice as wide as it is deep, which will give it the best flow characteristics. It can be used equally for roof gutters and drain channels.

* **DRAIN GRILLES** One area that is often under-designed is the grilles over drains. A good grille should be made up from 50mm x 50mm steel angle, 6mm thick and 50mm x 6mm flat steel bar, all welded together as shown in the diagram on page 70.

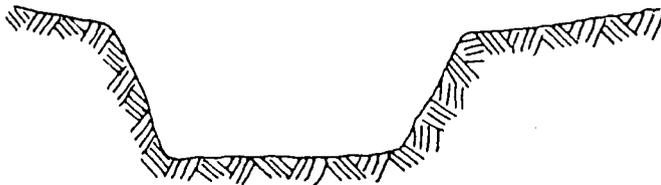
* **MAINTENANCE** It is important to ensure that the drains in and around the market are kept clear of any build-up of dirt, especially if they are unlined drains. Once every six months the cleaning staff should be given the job of clearing out the drains.

Storm water drain diagrams are given on the next page, page 70.

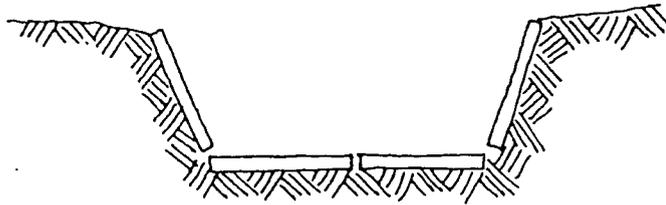
1.18 STORM WATER DIAGRAMS

PROFILES Good profiles for storm water drains; note their 2 unit width to 1 unit depth.

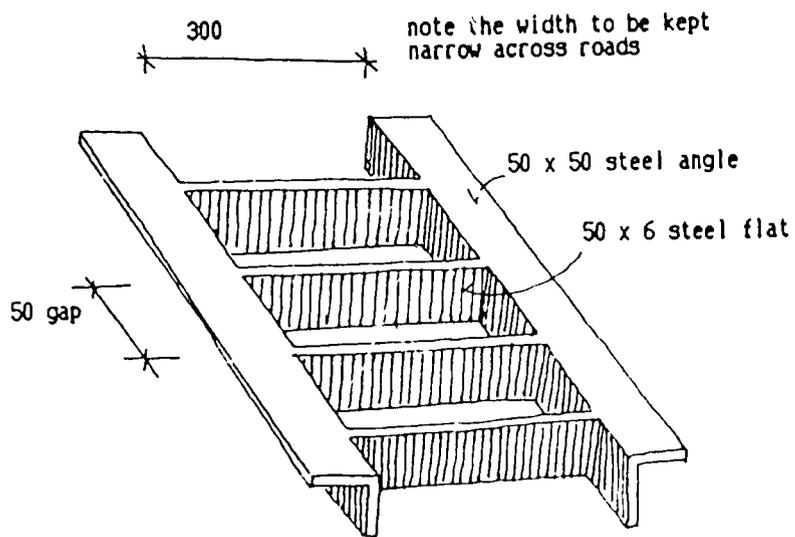
UNLINED



LINED



DETAIL. OF DRAIN GRILLE



1.19 PUBLIC TOILETS

Public toilets are one of the most difficult facilities for any Council to deal with. The successful solutions found to this problem seem to be at the two extremes. At one extreme they need to be highly sophisticated with a continuous and high level of supervision and maintenance and expensive finishes. At the other extreme the very simplest facility requiring almost no maintenance can be made to work well.

It is generally agreed that the expensive solutions are not appropriate. It is also clear that the ordinary domestic type of modern installation gets broken, damaged, blocked or abused fairly quickly. The main problem with ordinary flushing toilets is that they are easily fouled, easily blocked, and totally dependant on a good water supply. Even with a good water supply, as soon as the cistern is unable to refill before the toilet is used again the toilet will quickly block and become exceptionally unpleasant and unhygienic.

This leaves the cheap and simple facility as the solution most likely to succeed. A lot of work has been done on this and the result is the Ventilated Improved Double-Pit Latrine with Soakaway. This is illustrated on page 75.

* PIT LATRINES These have the benefit of requiring no water and no drains. All the excreted material is collected in a pit dug in the ground. A pit, measuring about 2.0 x 1.5 metres at the top and tapering down to 2.0 x 0.2 metres at its full depth of 1.8 metres, can be expected to last up to 2 years. Once full the pit should be sealed and left and within a further year the material will have decomposed to a fine, dry, odourless and hygienic powder which is very much like compost.

DOUBLE PITS The problem with single pits is that the toilets have to be relocated every 2 to 4 years. The double pit allows the toilet to continue in use with a second pit while the material in the first pit decomposes. Once decomposed, this can be cleared out by hand or machine and the first pit is ready for re-use while the material in the second pit decomposes, and so on, indefinitely.

- * VENTILATION Pit latrines have traditionally only been ventilated through the toilet itself. By adding a secondary ventilation pipe to the pit, it has been found that smells and insects can be controlled. This pipe acts like a chimney and discharges the smells above the toilet by drawing air through the toilet. Any flies that are attracted into the pit are drawn by the light at the top of the pipe and are trapped by the gauze cover.
- * ORIENTATION .. It has been found that facing the door towards the prevailing wind has the greatest effect on the performance of the vent pipe system. It is helpful, but not essential, for the external vent pipes to face west so that they receive the maximum sunshine to assist the ventilation.
- * LIGHTING The cubicles should be kept fairly dark, but well ventilated. Louvre blocks at high level are a good way of doing this.

- * **CLEANING** .. There are three aspects to this; the type of pan used, the disposal of cleaning water, and the cleaning itself.

TOILET PAN If an eastern style, or squatting pan is used then the toilet can be scrubbed or hosed down quite easily and this is a big advantage for ensuring that a very unpopular job is done properly.

WATER DISPOSAL This idea of washing down the toilet presents a problem in that the pit latrine is essentially a dry system, and quantities of water will upset its operation. This water must be disposed of, and this is done by putting in a soakaway connected to the toilet pit.

WASHING The floors should have a slope down towards the toilet pan of about 1 in 50 to ensure good drainage. Washing out should be a daily or twice daily requirement.

- * **FINISHES** .. If at all possible it would be worth having a tiled finish to walls and floors because, no matter how well designed the toilets are, there will be accidents. Cement type finishes are slightly absorbent with the result that over a period they will become permanently smelly.

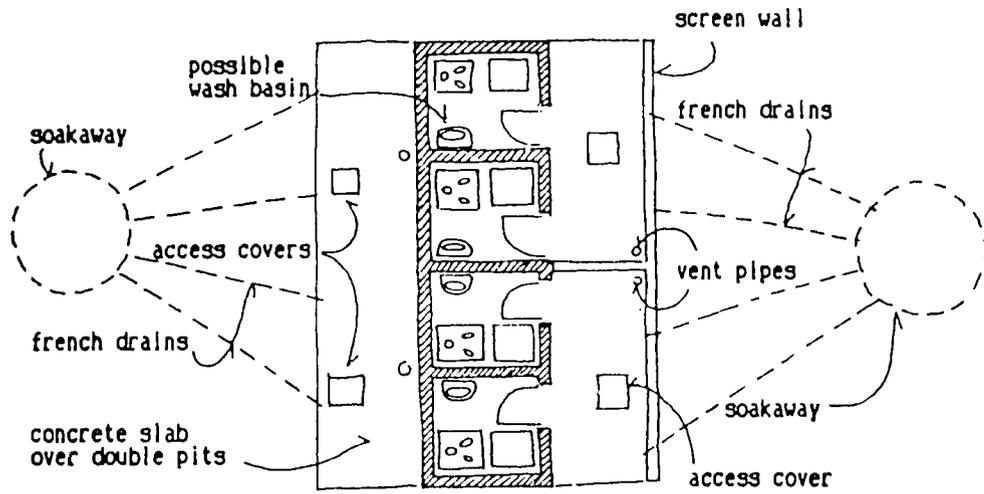
- * **ATTENDANTS** It has been found that by employing an attendant for the toilets damage and abuse is dramatically reduced. This will save the Council money, even over a fairly short period.

- * MULTIPLE TOILETS There are added design planning problems with the double pit arrangement when more than one cubicle is required. A suggested layout is shown on page 75.
- * URINALS .. It is not advisable to instal urinals with pit latrines because the urinals require regular flushing. This produces too much water for the pit to cope with.
- * SIZE AND NUMBER Each double pit latrine requires space for two pans, and so is nearly twice as large as a normal toilet cubicle. Each cubicle needs to be 1.4 x 1.4 metres minimum.

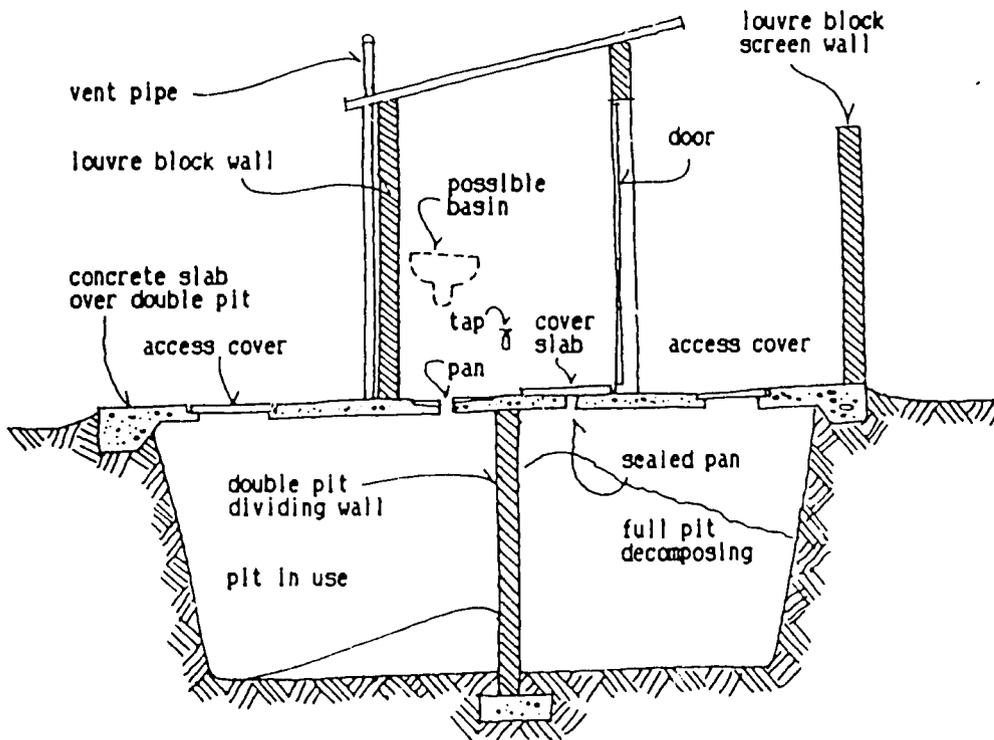
In any market these should be a minimum of two cubicles each for males and females. In markets with more than 60 stalls, for every 30 stalls there should be 1 cubicle each for male and females.

1.20 PUBLIC TOILET DIAGRAMS

Plan of set of latrines with double pits



Section through double pit latrine



1.21 SIGNS

Signs are one of the most difficult areas of design to carry out successfully, and are very often forgotten altogether. This section deals with the general aspects of the design of signs and the more detailed aspects of the different types of signs that are required in a market. When designing signs, the following considerations should be remembered:

- * **SIZE** The size of a sign must be related to the function it has to perform. Signs are generally made too small, particularly in outdoor situations. As a guide, the letter height, measured in millimetres, should be 8 times the distance from which they may need to be read, measured in metres.
- * **HEIGHT** .. It must be remembered when positioning a sign that, when the market is busy, there are many possible obstructions in the reader's way. It is important, therefore, to position the signs as high as possible to avoid the obstructions. In pedestrian areas, signs over doors will probably be visible, and signs beside doors may not.
- * **CLARITY** As signs are intended to be read, they must be clear, well set out and coloured in contrast to their background.
- * **DURABILITY** Signs should be designed to last as long as the building or function they are advertising. This will make most signs far more expensive than expected. If it is not considered worthwhile putting up a good, durable sign, then it is probably not worth putting up the sign at all. Cheap signs, that require either regular painting or are made of materials that will not last, will simply look scruffy in a relatively short time and are unlikely to convey information over the necessary distances.

When considering the different types of sign that are required around the market, this aspect of durability is the main criterion. This divides the signs into three distinct types.

- * SIGNS ON PAVING .. These can be painted onto the paving surface with road paint. As this is an easily repeatable exercise, this is a useful way of marking out areas around the market.
- * UNPROTECTED SIGNS Where signs are not protected from the weather they must be made of permanent materials. These include materials such as aluminium or brass, which are very expensive, or enamelled steel as used on many road name signs around the country, or letters carved into stone or cast in concrete. Painted or wooden signs should not be considered.
- * PROTECTED SIGNS Where signs are not exposed to the weather a wider range of materials can be used. The common ones that are likely to be satisfactory include engraved plastic, plastic laminates , or aluminium. Unless they are engraved wood signs should be avoided, and also any kind of painted signs.

1.22 SIGNS CHECKLIST

MAIN ENTRY -

market Name

MARKET HALL

retail
wholesale
fresh produce
chicken
domestic goods
tobaccos
clothing
etc.

ROADS

parking
no parking
loading area

BUILDINGS

public toilets
male and female toilets
office - private
door numbers
litter here
kiosks
refreshments
cafeteria

1.23 FENCING

The purpose of the fencing is to prevent theft of the goods on sale and to ensure that goods coming into the market can be monitored. In markets where the Council charges on the basis of the goods for sale, if there is no control on the site boundary, it is easily possible to bring unrecorded goods into the market and thereby avoiding paying the market charges.

To be effective the fence must prevent people easily climbing over or through it. An ordinary stranded fence will rarely be sufficient for this. The only commonly used fence that is likely to be effective is the chain link fence, and this should be at least 1.5 metres high. The fencing needs to be along all the sides of the market.

1.24 LIGHTING

Large open and unlit public spaces are often the cause of crime. It is important that the open market areas are sufficiently well lit at night to make the entire area clearly visible. Usually this can be done using bulkhead lights attached to the buildings around the site, but care must be taken to ensure that all the potentially dark areas between buildings are properly lit or they will make ideal hiding places for criminals.

1.25 LANDSCAPING

This has already been discussed on pages 32 and 49.

Planting trees around the site will make it much more attractive as a place to be and will also provide useful shelter at a very low cost. An allowance for planting of 15% of the cost of construction of an open-air market, or 5% of the cost of construction of a covered market would be of real benefit.

SECTION FOUR --- MATERIALS

CONTENTS	PAGE
1. THE CHOICES	
1.1 building types	82
1.2 paving materials	84
1.3 roofs	86
2. PERMANENT CONSTRUCTION	88
3. COST EFFECTIVE DESIGN	89

SECTION FOUR --- MATERIALS

1.0 THE CHOICES

The first decisions to be made when considering a market design are the choices of materials for the paving, and for the walls and roofs of the buildings. These decisions set the level of the final construction cost, the amount of maintenance required, the overall appearance of the market and how well it stands up to the test of time.

These choices are vital to the Council because they will affect the success of the market in terms of its revenue earning ability in an unalterable way.

1.1 BUILDING TYPES

The first area of choice is for building types. It is generally assumed that some form of permanent construction is necessary for all buildings, but this is not necessarily true.

* COST COMPARISONS When the likely earnings from all of the market facilities are considered, the capital cost of building in concrete blocks with concrete floors and sheet roofing is relatively high even though this is likely to be the cheapest form of permanent construction.

* ALTERNATIVES If it can be accepted that kiosks and tea rooms are built using wooden frames and mabatl in the traditional manner, the land in the market can be rented out to the prospective stall owners who must build their own kiosks. The development is then free to the Council and so nearly the whole income will be useful revenue.

There are alternatives between permanent construction and fully self built construction. These may include either of the following:

STANDARD DESIGNS The Council may decide to use a standard design. They will then insist that any kiosks, tea rooms or other buildings constructed in the market are built following these standard designs.

STANDARD UNITS The Council may build standard units for rent. These units maybe in a cheap form of construction but at least they will all look the same.

No particular financial advantage is seen in either of these because the cost to the Council will be higher. The Council is unlikely to be able to charge sufficiently higher rents to cover this extra cost.

- * ESSENTIAL SERVICES If the Council accepts the alternative of tenant built buildings, the only costs that will have to be incurred, apart from the land, will be for the water supply and drains to plots for tea rooms.
- * CONTROLS All the facilities, with the exception of offices and public toilets, can be provided in any of these alternative ways. An aspect that may concern Councils is the amount of control they require over the appearance of the development. Apart from supplying the units or restricting designs as described above, there is little the Council can do to control what the development will look like. This is part of the choice that has to be made between these alternative systems of development.

1.2 PAVING MATERIALS

As far as paving surfaces are concerned there are several options and these are discussed below in rising order of cost. Each alternative has a cost factor which shows how their costs compare with each other. A life factor is not included because in pedestrian areas under normal circumstances paving can be expected to last indefinitely.

- * MURRAM Cost factor ; 1.0
Can be a good and reasonably durable surface but it will become dustier in dry seasons and muddier in wet seasons as time goes on, particularly if it is not maintained properly. It can also be quickly washed away if drainage is not carefully considered. Murram can be improved with a cover of stone chippings to keep the dust down and this can make a very good and easily repairable surface. This is suitable for areas of non-perishable goods but is difficult to keep clean.
- * CONCRETE PAVING SLABS Cost factor ; 1.5
A common paving option for all types of areas restricted to pedestrians only. They must be laid carefully to avoid ponding and edges over which people may trip. They are easily cleanable, and fairly easily repairable.
- * TAR SPRAY AND CHIPPINGS Cost factor ; 2.7
This is not a good option because the very coarse surface makes it difficult to clean off any squashed and rotting vegetables.

- * INTERLOCKING CONCRETE SLABS .. Cost factor ; 3.3
 Because the slabs are small and loose jointed they are unlikely to break. They can easily be replaced if they do break or re-laid if the surface becomes too uneven over time. The large number of joints makes them slightly more difficult to clean than paving slabs but the smoother surface makes them easier than premix.

- * PREMIX Cost factor ; 4.0
 This is better than tar spray and chippings because it is thicker and stronger. Like tar spray and chippings the surface is still comparatively rough and difficult to clean but the use of fine aggregates can improve this considerably.

- * CAST CONCRETE Cost factor ; 6.0
 Concrete cast on site is expensive and requires careful control but the end product is very good. It is possible to lay concrete with an integral topping or smooth trowelled surface, but it is generally finished with a sand and cement screed to give as smooth a surface as possible.

1.3 ROOFS

The importance of the roof over a covered market has already been discussed on pages 49 to 53. For the construction of this roof we have also noted that some form of lightweight sheeting is the most appropriate. The materials available for roof covering are discussed in more detail below.

These notes are intended as a guide only. They do not include details of all the different variants (such as gauge, profile, colour, thickness, width and length) available in each of the different categories. They should only be used for a qualitative assessment of the materials' merits.

The life factors of these materials have not been included because they can all be considered to have a useful life of at least 25 years in normal use. This is not true in coastal areas for mabati.

* PROFILED STEEL Cost Factor3.0

There are several different profiles available in profiled steel sheet and they are supplied with a factory applied colour coating. The sheet can be supplied in very long lengths if necessary and this is useful for large roof spans as it avoids jointing down the slope of the roof. The colour coating is attractive, can be supplied in a range of colours and, as it is very durable, does not require any maintenance. As the sheets are comparatively light in weight and a 50 mm deep profile can span up to 1.8 metres, they can be supported on an economical structure.

* MABATI Cost Factor1.0

Strictly known as corrugated galvanised steel sheet, mabati is the cheapest form of roofing available. It is not very attractive and can be painted to improve its appearance, but this is not recommended because it creates a regular maintenance problem. The sheets are more flexible than profiled steel sheets, requiring supports at 1.0 metre spacing.

* ASBESTOS CEMENT Cost Factor2.0

Asbestos cement sheet comes in a number of different profiles, each of which has different strength characteristics. The deep profile sheet can be compared with profiled steel and the shallow profile sheet can be compared with mabati for strength. Asbestos cement is widely used as a roofing sheet and is locally manufactured. The standard grey colour is not very attractive but is less obtrusive than shiny mabati.

Asbestos cement has two main drawbacks. Firstly, the sheets are brittle and so can be broken if mistreated, either being handled in construction, or if someone walks carelessly on the roof for maintenance, or if subjected to vandalism. Secondly, asbestos fibres have been identified as a health hazard if inhaled. Although this does not directly affect the Council, it should be remembered that the use of asbestos products is being phased out in many countries and markets may be considered particularly sensitive areas.

* TILING Cost Factor4.0

There are several types of tiles available for roofing but they all have the same principle characteristics. Tiles are much heavier than roofing sheets and so require a stronger and therefore more expensive structure to support them. They are also more attractive than sheets and should be given serious consideration where the appearance of the roofs is of importance.

2.0 PERMANENT CONSTRUCTION

Having looked at the alternatives discussed on page 82, the Council may decide that the more permanent forms of construction are required. There is also the question of the construction of the public toilets and the offices, which will almost certainly require permanent construction. For these buildings, the following should be considered.

- * SPLASHING Because of inevitable splashing of rain around the building it is worth either including a splash plinth in the design (a dark band up to about 0.8 metres) or making sure the walls have a band of paving or gravel beside them of 0.6 metres minimum width. If this paving reaches just beyond the edge of the roof overhang then this is ideal.
- * VENTILATION Standard louvre blocks are an excellent way of providing security, privacy and ventilation and can be useful in public toilets, offices and tea rooms.
- * WINDOWS These should be of the louvred type because they are very much cheaper and provide 100% ventilation area when open. Louvre blade widths can go up to a maximum of 0.9 metres. If additional security is required then 19mm diameter steel bars should be built into the frames at the same distance apart as the louvre blades.
- * ORIENTATION This has been mentioned previously on page 35. Those recommendations should be followed.

3.0 COST EFFECTIVE DESIGN

In making these choices the comments in the introduction about the purpose of the facility and the balance between cost and revenue should be remembered.

- * OBJECTIVE It is worth repeating that the objective is to maximise the usable income for the Council. This serves the best interests of the community by providing the finance which can then be used for other projects which will enhance the town's amenities and appearance.
- * EFFECTIVENESS To make the market effective, the design choices at every stage must be made with the purpose of achieving this objective. An unnecessarily expensive choice, or a choice that will require frequent maintenance, will make the market less effective.
- * UPGRADING ... A programme of steady upgrading is self financing may avoid the need for further borrowing.

SECTION FIVE --- MANAGEMENT

1. REVENUE COLLECTION	
1.1 retail markets	91
1.2 wholesale or open-air markets	92
1.3 collusion	93
1.4 avoidance	95
2. RECORDS	96
3. PERIODIC CHECKS	97
4. CONSTRUCTION	98

SECTION FIVE --- MANAGEMENT

1.0 REVENUE COLLECTION

Remembering that one of the main objectives of markets is to generate revenue for the Council, the question of revenue collection is clearly very important. There are two basic types of market which have different revenue collection requirements.

1.1 RETAIL MARKET

The retail market is made up of stalls and shops. These stalls are rented on a regular basis by tenants and so the income is precise and payment can be easily recorded. It is common practice for stalls to be rented by persons or groups who then sublet the stalls to farmers or other local agencies. The danger with this system is that stalls can stand empty. It is important to ensure that regular use of the stall and regular payments are conditions of any rental agreement.

1.2 WHOLESALE OR OPEN-AIR MARKETS

All the remaining market vendors will need to be treated as wholesalers. There are true wholesale vendors who are selling in bulk, often to regular stall holders. The remainder are farmers who only come to sell when they have produce and could not rent a stall on a regular basis. The only fair ways to charge these groups are:

- * STANDARD RATES The Council fixes rates for a kiondo, kikapu, ndoo, and sack.
- * ESTIMATED VALUE The Council collectors will estimate the value of the produce being brought in and charge a percentage of that value as the rental.
- * SPACE .. The Council sets up basic areas and the vendors are charged a dally ground rent for those areas. To work properly it is usual to mark out basic spaces on the floor and the vendors are charged for multiples of the basic space.

Revenue collection in the wholesale market is the area where many Councils seem to have the most difficulty. There could be an increase in income of as much as 100% when estimated from the quantities of goods and stalls recorded in surveys.

There are several reasons for incomplete revenue collection, but the most common is collusion between collectors and vendors. The second most common reason is avoidance of the market by the vendors.

1.3 COLLUSION

- * COLLECTION STAFF .. Problems with collection are often related to the size of the collection staff. With a small staff there are no checks on their performance. The small payments as bribes by vendors once they are familiar with a collector loses the Council a regular income.

To avoid this, it is necessary to establish what income may be expected and provide checks to see that it is collected. By improved collection methods the income can be increased by a large amount .

Staffing costs for a market are very low in comparison with the income. In situations where the Council finds it is not collecting as much revenue as it expects, increased staffing will generally improve collection.

- * COLLECTION The council has two options. Ticketing for both options is the only way of ensuring full collection.

ENTRY Collection can be made on entry to the market. This tends to cause difficulties with small farmers who will often protest that they do not have the money to pay until they have sold some goods.

ROVING Collection can be made by collectors moving around the wholesale area. This avoids the objection of having no money at the time of entry but it is a more difficult system to operate and check.

* ENTRY ... By operating an entrance ticket sale point and checking vendors' tickets, the difficulties of collusion are doubled. This requires at least a collector and an inspector on duty at one time, and they should be regularly changed (say once a month).

* RANDOM CHECKS To reduce the chances of collusion, inspectors should carry out random checks of the operation, including checking tickets within the wholesale area.

Another check that needs to be carried out every now and then is a simple survey of the produce on sale in the market. This is similar to the survey required to estimate the size of market on pages 7 to 9.

* TICKETING The tickets sold to the vendors should be dated and show the quantity or value of produce. They should be duplicated and one of kept for the records. The tickets should be in numbered books and issued to the collectors who should be responsible for them. The vendor's half of his ticket should be destroyed on departure to avoid re-use.

These provisions are simple to operate and provide the material for checking. If it is then made clear that checks will be carried out, it will be extremely difficult for operators to avoid paying the dues to the Council by collusion with the market staff.

1.4 AVOIDANCE

- * ASKARIS A few askaris should be on duty around the town to enforce the requirement that other hawkers and small vendors use the market. These askaris should also be changed around to avoid collusion.
- * BY-LAWS One of the biggest difficulties encountered with revenue collection is the lack of by-laws to enforce them. It is essential that the Council has the means to enforce its requirements. Some Councils find they cannot change their charges because they are detailed in the by-laws. Others find the by-laws do not give them the authority to penalise hawkers or vendors who refuse to use the market.

2.0 RECORDS

It is common practice to combine all the town cleaners or askaris together, to record all the maintenance expenses under one head or even to combine markets with other non-revenue earning facilities such as parks and open spaces. This is not good practice. As the market is an important revenue earning facility it is essential to keep its records separate from others.

By keeping all the market finances together it is possible to be quite clear about the income from the market and the cost of maintenance and other expenses, such as the loan repayments.

3.0 PERIODIC CHECKS

- * SURVEYS It is important that surveys are carried out from time to time to confirm original predictions of demand, to check revenue against what is actually being sold in the market and to give guidance on where re-allocation of funds can most usefully be made.
- * COLLECTION Another useful check that senior Council staff, or even special inspectors can make is to visit the market unannounced and take over the job of revenue collection for a day. In this way it is possible to see exactly how many vendors are using the market. This is a direct check on whether or not the collected income for that day relates to the average daily intake.

4.0. CONSTRUCTION

- * MANAGEMENT The management of construction contracts is a specialist's job and must be handled with caution because of the legal implications of contract law. In circumstances where the Council wishes to organise the documentation and manage the contract, reference should be made to the manual on the Management of Construction Contracts.
- * CONSULTANTS ... This manual on the Management of Construction Contracts also contains advice on the procedures and checks that should be carried out when supervising or checking other consultant's work.

SECTION SIX --- APPENDICES

1. SPECIFICATIONS

1.1	standard paving specifications	100
1.2	standard roofing specifications	102

2. GENERAL NOTES

2.1	black cotton soils	104
2.2	drainage	104

3. WORKSHEET BLANKS

3.1	survey data sheet	106
3.2	data log sheet	107
3.3	construction cost estimate	108

APPENDIX ONE --- SPECIFICATIONS

1.0 CAUTION

These specifications are not intended to be and should not be used as complete items for construction documentation. They will only give a guide to the expected type and standard of construction.

1.1 STANDARD PAVING SPECIFICATIONS

Standard specifications for the pavings described in the manual are noted below. These can be used for obtaining prices and checking against design proposals.

- * MURRAM Strip off 150mm top soil. If soil is poor then stabilize surface by digging up top 75mm, mixing with 3% max lime or cement, wet and compact. Cover with 150mm murrum compacted with a 12 ton roller.
- * TAR SPRAY AND CHIPPINGS Strip off 150mm top soil. Lay 200mm deep hand packed stone and blind with stonedust. Spray with binder as seal coat. Spray one coat tar, spread chippings, spray second coat tar and spread chippings.
- * PREMIX (TARMAC) Strip off 150mm top soil. Lay 200mm deep hand packed stone and blind with stonedust. Lay and roll premix in two layers. First layer 25mm coarse aggregate and second layer is 15mm fine aggregate premix.

* CONCRETE SLABS Strip off 150mm top soil. If soil is poor then stabilize surface by digging up top 75mm and mixing with 3% max lime or cement, wet and compact. Cover with 50mm sand. Lay 50mm thick blocks.

* INTERLOCKING CONCRETE BLOCKS ... Strip off 150mm top soil. If soil is poor then stabilize surface by digging up top 75mm and mixing with 3% max lime or cement, wet and compact. Cover with 50mm sand. Lay 80mm thick blocks.

Note: It is essential that curbs are used with interlocking concrete blocks.

* CAST CONCRETE Strip off 150mm top soil. Lay and compact 150mm hardcore or murrum. Lay 150mm concrete in maximum 3m x 3m bays reinforced with A193 mesh (2 layers on poor soil). Fill joints with sand/bitumen mix.

1.2 STANDARD ROOFING SPECIFICATIONS

- * CORRUGATED GALVANISED STEEL (GCI) Fix 900mm wide, 3000mm long, 24 gauge gci sheet onto 150mm steel zed purlins at 1000 mm centres with ms hook bolts on the second roll of each sheet. Sheets to have single roll side laps and 150 mm end laps. Fixings to have plastic sealing washers. Zed purlins to be supported at maximum 6 metre centres. Ridges and abutments to be flashed with 24 gauge gi sheet flashings lapped 150 mm at all joints.
- * CORRUGATED ASBESTOS CEMENT Fix 900mm wide, 3000mm long, corrugated asbestos cement sheet to 150mm steel zed purlins at 1000mm centres with ms hook bolts on the second roll of each sheet. Sheets to have single roll side laps and 150mm end laps. 2 diagonally opposite corners are to be cut to allow flush seating at end laps. Fixings to have plastic sealing washers. Zed purlins to be supported at maximum 6 metre centres. Ridges and abutments to be flashed with standard asbestos cement fittings lapped 150mm at all joints.
- * PROFILED ASBESTOS CEMENT Fix 900mm wide, 3000mm long, deep profiled asbestos cement sheet to 150mm steel zed purlins at 1500mm centres with ms hook bolts on the second roll of each sheet. Sheets to have single roll side laps and 150mm end laps. 2 diagonally opposite corners are to be cut to allow flush seating at end laps. Fixings to have plastic sealing washers. Zed purlins to be supported at maximum 4 metre centres. Ridges and abutments to be flashed with standard asbestos cement fittings lapped 150mm at all joints.
- * PROFILED STEEL SHEETS Fix 900mm wide, 24 gauge, colour coated, deep profiled steel sheets in single lengths to 150mm steel zed purlins at 1500mm centres with ms hook bolts on the second roll of each sheet. Sheets to have single roll side laps and 150mm end laps. Fixings to have plastic sealing washers. Zed purlins to be supported at maximum 6 metre centres. Ridges and abutments to be flashed with similar steel sheet flashings lapped 150mm at all joints.

- * SINGLE LAP TILING Lay concrete interlocking single lap tiling to broken joints on 38x38mm tiling battens at approx 300mm centres fixed to 100x50mm rafters at 600mm centres supported on 175x50mm purlins at 1500mm centres. Tiles to have matching ridge pieces neatly bedded in cement mortar. At all verges standard half tiles are to be used to align courses. 500 gauge polythene sheet is to be laid over rafters parallel with the eaves and with 150mm overlaps down the slope. Every fourth course, the ridge and eaves courses, and all verge tiles are to be nailed to the battens.

- * DOUBLE LAP TILING Lay clay plain nibbed double lap tiling to broken joints on 38x50mm tiling battens at approx 175mm centres fixed to 100x50mm rafters at 600mm centres supported on 175x50mm purlins at 1500mm centres. Tiles to have matching ridge pieces neatly bedded in cement mortar. At all verges standard one and a half tiles are to be used to align courses. 500 gauge polythene sheet is to be laid over rafters parallel with the eaves and with 150mm overlaps down the slope. Every fourth course, the ridge and eaves courses, and all verge tiles are to be nailed to the battens.

- * PANTILES Lay clay plain pantiles reversed in alternate rows on 38x50mm tiling battens at approx 300mm centres fixed to 100x50mm rafters at 600mm centres all supported on 175x50mm purlins at 1500mm centres. Tiles to have matching ridge pieces neatly bedded in cement mortar. Align rows so that pantiles are laid hogsback fashion at all verges. 500 gauge polythene sheet is to be laid over rafters parallel with the eaves and with 150mm overlaps down the slope. Every hogsback pantile in each fourth course, the ridge and eaves courses, and all verge pantiles are to be nailed to the battens.

APPENDIX TWO --- GENERAL NOTES

2.1 BLACK COTTON SOILS

Note that on black cotton soils it is essential that at least 600mm depth is removed and replaced with a good soil (red soil) to provide a stable base for any paving material.

Buildings constructed on black cotton soils should be built with raft foundations. This is a specialist's job and should only be designed by qualified structural engineers.

2.2 DRAINAGE

All road surfaces should be laid with a 1 in 50 slope to ensure adequate drainage and prevent ponding on the surface.

APPENDIX THREE --- WORKSHEET BLANKS

1. SURVEY SHEET
2. DATA LOG SHEET
3. CONSTRUCTION COST ESTIMATE WORKSHEET

SURVEY SHEET

LOCATION:

SUPERVISOR:

DATE: REFERENCE:

No.	Location	Area of Stalls	No of Stalls	Type of Goods	Type of Stall
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

CONSTRUCTION COST ESTIMATE WORKSHEET -

REFERENCE DATE
 LOCATION BY

Design element	Size, Area, No of units.	Cost for each unit.	Estimated cost
1. roofing - retail		x	=
wholesale ..		x	=
2. offices		x	=
3. cleaners		x	=
4. stores		x	=
5. walling		x	=
6. fencing		x	=
7. signs		x	=
8. paving - retail		x	=
wholesale ..		x	=
9. stalls		x	=
10 public toilets alternatives; (fill in one only)		x	=
flushing		x	=
latrine		x	=
11 washing facilities		x	=
12 stormwater drains		x	=
13 ticket check booth		x	=
14 roads/parking alternatives; (fill in one only)		x	=
murrum		x	=
tar spray		x	=
premix		x	=
pcc blocks ..		x	=
concrete		x	=
15 curbs		x	=
16 loading platform		x	=
17 landscaping		x	=
18 security lighting		x	=
19 kiosks		x	=
20 cafeteria		x	=
21 tea rooms		x	=
<hr/>			
22 SUBTOTAL			
23 Contingency (15%)			
24 Contract overheads (10% pa)			
<hr/>			
25 CURRENT TOTAL CONSTRUCTION COST			
<hr/>			
FUTURE TOTAL CONSTRUCTION COSTS:			
26 Inflation	%	(see 4.2 UPDATING ESTIMATES, p22)	
27 After 1 year ; item 25 x $\frac{(100 + \text{item 26})}{100}$			
28 After 2 years ; item 27 x $\frac{(100 + \text{item 26})}{100}$			
29 After 3 years ; item 28 x $\frac{(100 + \text{item 26})}{100}$			

100