REPORT OF MISSION

TO

THE SOMALIA DEMOCRATIC REPUBLIC

QUANTIFICATION OF CONSTRUCTION MATERIALS

FOR COMMUNITY FACILITIES

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June 20, 1980, Mogadishu, Somalia.

MISSION OBJECTIVES

The specific terms of this consultancy were to prepare a list of building materials for the construction of the community facilities in the refugee camps of Somalia. This list would identify the materials that, out of necessity, need to be purchased on the international market.

However, the time available fot this consultancy was too brief to complete the list. Consequently this report demonstrates the procedure to be taken to analyze the material needs and to arrive at the final list.

This list of specific materials could only be based on a set of specific building designs or guidelines. As no such designs or guidelines existed at the beginning of this consultancy it was necessary to prepare the guidelines and make assumptions on availability of local material and construction procedures.

To arrive at the recommendations made in this report it was essential to make an assessment of the existing community facility building stock. This required an on site investigation of each camp to identify, measure, and evaluate the relative permanency of each community facility building.

The community needs of each camp also had to be determined. The basis of that calculation is the Report of Mission to the Somalia Democratic Republic prepared by Babar Mumtaz of UN HABITAT. In it certain standards for facilities for each camp were presented based on camp population. Further development of these Mumtaz standards were necessary in the field of health facilities as there had been modifications made to them since the report was written.

Because of the limitations of time I was only able to make the on-site camp assessments at all of the camps in the Hiran and Corioli region. The UNHCR regional office in Hargesa made the assessment in the Northwest region and the Swiss team in Gedo made it in that region.

This consultancy was carried out from June 6, 1980 to June 21, 1980.

EXISTING CONDITIONS

The assessment of the camps disclosed several important issues of the existing conditions. They had an important impact on the evaluation of the needs for the construction program.

    A. There is wide range of community facilities in place. The new camps have virtually no permanent or semi-permanent facilities. The need for them, especially those related to health care, is extremely urgent. The older camps, on the other hand, have many or most of their facility needs in place. The additional facilities, though, will substantially improve the services to them.

    B. There is a wide range of the quality of construction of the existing facilities. Many are obviously temporary such as the tents and make-shift structures of local materials. Other buildings using corrugated iron (C.I.) roofing and a wood truss structure are well built and, with maintenance will have a long life. There are also some community facilities made entirely of local materials in the traditional manner that are so well built they also appear to have a long life ahead of them. However, a large number of buildings using new C.I. roofing and sawn wood roof framing are so poorly constructed they could likely collapse or require disproportionate maintenance.

    C. There are presently three different expatriot agencies involved in the construction projects. Each has their own approach and philosophy on the building design and method of construction. The needs for the community facilities though are uniform. A coordination of approach to future construction appears to be needed.

DESIGN ASSUMPTIONS

In order to calculate the amount of materials necessary for each type
of building it was necessary to make certain assumptions.
These assumptions included the following:

A. It is necessary to standardize the method of construction among all
    the building types, except for the health centers.

B. All of the buildings types are based on area standards that occur in
    modules of 20 M^2. Therefore, a building bay of approximately 20 M^2 is
    the most practical unit upon which to base a building design.

C. Most of the building types are made up of an aggregation, or adding on,
    of several units. For example, a camp that needs 10 classrooms will
    not build 10 separate buildings each 40 M^2. Instead it is likely to
    build 2 buildings with 5 classrooms each. The shape of these buildings
    in terms of proportion of length to width is very important. The longer
    and more narrow the building is the more exterior wall area is required
    to enclose the space. The shorter and wider the building   the less
    wall area is required.
    For example, if 5 classrooms of 40 M^2 were to be built in one building
    the total area would be 200 M^2. If the building was 4 M wide it would
    be 50 M long. If the walls were 2 M high the building would have
    248 M^2 of interior and exterior walls. But if the building was 7 M wide
    it would be about 28 M long. This building would have only 156 M^2 of
    interior and exterior walls or a savings of 92 M^2 of wall or 37%.
    The cost of the roof and structure is nearly the same
    but the savings in wall area is very important especially because of
    the limited supply or the high cost of building materials.

D. It is necessary to build the building design on a standard of construction
    that will ensure that it will be safe and sound for several years.
    This means that the structure skeleton will have to be based on a well
    built roof truss, tied to sturdy posts firmly set into the ground and
    with diagonal bracing at the corners to resist the strong wind pressures.

E. The materials to be ordered are based on the assumption that all of the
    walls will be constructed from locally available materials. The principle
    materials will be branches for wattle and daub construction and stone.

F. It is important that the building design and the building process be
    as uncomplicated as possible. Therefore, the number of building components
    will be reduced to an absolute minimum.

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They consist of posts, only one size of lumber for the entire roof
structure and wind bracing, roofing sheets, wire to attach the walls
of branches to the posts and cement.
It is theoretically possible to make a savings in the total amount
of wood required to build the roof structure if every length, width
and depth were calculated exactly for its use. In actual practice
there will probably be 26 or more people in charge of supervising
construction. There is little chance that they would all learn the
most efficient and economical use of a variety of wood sizes.

G. For the purpose of making the construction process as simple as
possible the dimensions of the building module, or bay, is exactly
7 M wide. The structural frames are 3 M apart. The exact area of each
module then is 21 M^2 instead of the theoretical 20 M^2 module.

The following method has been employed to determine the required area
needed for each building type and for the amount of materials needed to
build the structures.

A. **Food Stores.** The total required area for food stores is equal
to the population of the camp divided by 1000 and multiplied
by 17 M^2 per 1000. For the number of building units divide
that total by 80 M^2 and round off to the nearest half unit.
For example, 53,000 refugees in one camp, divide by 1000=53
multiply by 17 M^2=901 M^2 divide by 80 M^2/unit = 11.2 or
11 units. If the camp already has 204 M^2 of food stores then the
new construction must be 901 M^2 minus 204 M^2 = 697 M^2.
Divided by 80 M^2/unit we need 8.7 new units, rounded off to
8½ new units of 80 M^2 each.

B. **Health Centers.** It is the intention that each camp shall have
constructed a new health center with a standard of construction
higher than the other buildings. They are all plannned to be
120 M^2 of enclosed space. Therefore, 26 health centers of
these areas will be built.

C. **Health Posts.** It is intended that each sector of each camp have
its own health post. Many camps have already formed these sub-
groupings. Therefore, a camp that is now divided into 4 sections
will have 4 health posts. If a camp has not been so divided
we can use the standard of a health post for every 6,000 in-
habitants.

D. **Classrooms.** The calculation for the number of classrooms is
based on the standards presented in the Mumtaz Report.
It assumes that in each camp 30% of the population is of the
age to attend shool, 7 to 15 years old. At this time we will
build enough classrooms for 25% of that population. It is
assumed that one 40 M^2 classroom will accommodate 40 children
each in two shifts for a total of 80 children. Therefore, to
calculate the total number of classrooms multiply the camp
population by 30%, multiply that figure by 25%, divide that
figure by 80. That number (rounded off to the nearest whole
number) is the number of classrooms needed for the camp.
For example, Lugh Jellow has a camp population of 50,000,
multiply by 30% = 15,000, multiply that by 25% = 3750, divide
that by 80 = 46.8 or 47 classrooms of 40 M^2 each.

E. **Administrative Offices.** The standard adopted from the Mumtaz
Report is for 20 M^2 of office for each 10,000 inhabitants of
each camp. Therefore, to calculate the number of 20 M^2 units
required divide the camp population by 10,000 and round off
to the nearest whole number.

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F. <u>Community Centers</u>. Each camp shall have one 42 M^2 community center.

G. <u>Feeding Centers.</u> In some sections of some camps the supplementary feeding program will be run from part of the health post. In other locations it will be run from a separate feeding center of 42 M^2 of enclosed space adjacent to 100 M^2 of shaded (covered but open) space.

H. <u>Housing for staff</u>. The construction of the staff housing will be contracted out to various agencies. It will, therefore, not be included in this material procurement.

ROOFING

TRUSS

POST

TAMPED EARTH
OR CONCRETE

CONCRETE

frames ocurr 3 meters on center

FIGURE 1

- 7 -
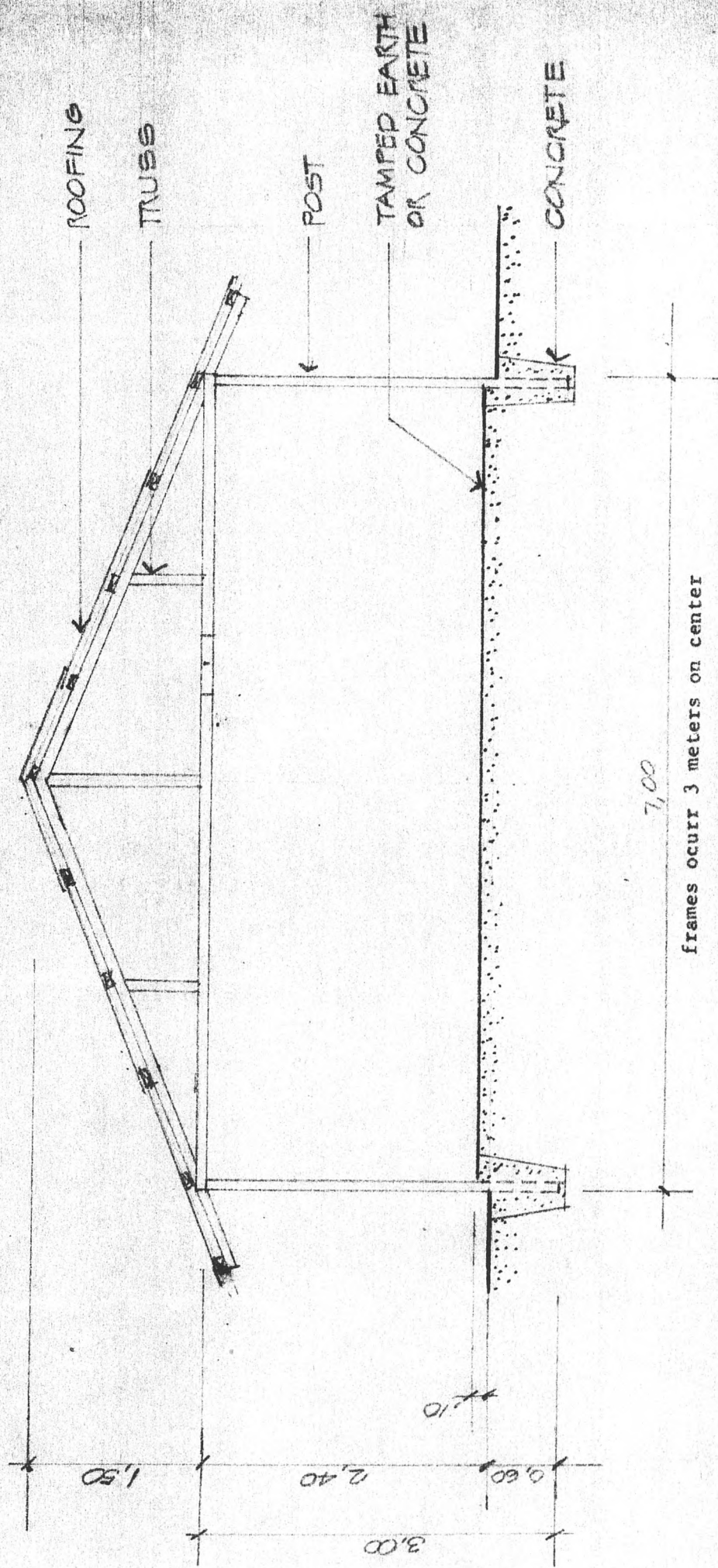
Figure No.1 illustrates the basic building module upon which the calculations for the quantity of materials are based. The following points demonstrate how the total of the materials is calculated for each building type.

A. Each building is comprised of a certain number of modules, each additional module after the first simply consists of adding one frame and roofing for that additional area. The first module, however, consists of two frames and the roofing. Consequently to begin the material calculation for each building it is necessary to first calculate the materials for that first frame. Therefore, each additional module is in every case an additional frame and roofing. This can be referred as the "starter frame". It consists of 2 posts, 4½ pieces of lumber for the truss and 30 lineal meters of wire to tie branches to the frame and ¼ sack of cement for the post holes.

B. The material for each additional module or bay, after the starter frame consists of 2 posts, 4½ pieces of lumber for the truss, 7½ pieces of lumber for the perlins (horizontal roofing supports) for a total of 12 pieces of lumber; 30 sheets of corrugated iron roofing 2,00 x 0,65 M; 20 lineal meters of wire; 1 kg of 6 cm nails and ¼ sack of cement for the post holes.

C. For each 40 M^2 module there will be 3 pieces of lumber for a door frame and one sheet of corrugated roofing and ¼kg of nails.

D. For each entire building there would be 8 pieces of lumber for diagonal wind bracing.

E. At each end wall there would be 30 M of wire to tie the branches to the frame and 30 M at each interior partition separating the rooms.

F. The health centers will be constructed with walls of concrete block or local stone. The roof truss is expected to be the same. The material quantities for one health center are calculated separately.

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G. For those buildings with a concrete floor the following method was used to calculate the cement. Assume a concrete slab thickness of 5cm multiply by module size of 3M x 7M = 1.05 M^3 of concrete. Use 4 sacks of cement per M^3.

The following is the calculations of building materials for each building area of from 21 M^2 to 105 M^2 and for the health centers.

$21 \ M^2$: | starter frame | posts | 2 | units |
| --- | --- | --- | --- |
| | lumber | $4\frac{1}{2}$ | |
| | wire | 30 | M |
| | nails | $\frac{1}{4}$ | kg |
| | cement | $\frac{1}{4}$ | Sack |
| 1 module | posts | 2 | |
| | lumber | 12 | |
| | roofing | 30 | |
| | wire | 20 | M |
| | nails | 1 | kg |
| | cement | $\frac{1}{4}$ | Sack |
| 1 door | lumber | 3 | |
| | roofing | 1 | |
| | nails | $\frac{1}{4}$ | kg |
| bracing | lumber | 8 | |
| end walls | wire | 30 | M |

TOTAL :	posts	4	
	lumber	$27\frac{1}{2}$	
	roofing	31	
	nails	$1\frac{1}{2}$	kg
	wire	80	M
	cement	$\frac{1}{2}$	Sack
if building has concrete floor	cement	4	Sacks

total area of walls and partitions		40	M^2

<u>42 M² :</u> starter frame

starter frame	posts	2	units
	lumber	4½	
	wire	30	M
	nails	½	kg
	cement	½	Sack
2 modules	posts	4	
	lumber	24	
	roofing	60	
	wire	40	M
	nails	2	kg
	cement	½	Sack
door	lumber	3	
	roofing	1	
	nails	½	kg
bracing	lumber	8	
end walls and partitions	wire	30	M

TOTAL :	posts	6	
	lumber	39½	
	roofing	61	
	nails	2½	kg
	wire	100	M
	cement	1	Sack
if building has concrete floor	cement	8	Sacks

total area of walls and partitions   52 M²

63 M^2 :	starter frame	posts	2	units
		lumber	4½	
		wire	30	M
		nails	½	kg
		cement	½	Sack
	3 modules	posts	6	
		lumber	36	
		roofing	90	
		wire	60	M
		nails	3	kg
		cement	1	Sack
	2 doors	lumber	6	
		roofing	2	
		nails	½	kg
	bracing	lumber	8	
	end walls and partitions	wire	60	M

TOTAL :	posts	8	
	lumber	54½	
	roofing	92	
	nails	4	kg
	wire	150	M
	cement	1	Sack
if building has concrete floor	cement	12	Sacks

total area of walls and partitions   78   M^2

84 M^2 :	starter frame	posts	2	units
		lumber	$4\frac{1}{2}$	
		wire	30	M
		nails	$\frac{1}{2}$	kg
		cement	$\frac{1}{2}$	Sack
	4 modules	posts	8	
		lumber	48	
		roofing	120	
		wire	80	M
		nails	4	kg
		cement	1	Sack
	2 doors	lumber	6	
		roofing	2	
		nails	$\frac{1}{2}$	kg
	bracing	lumber	8	
	end walls and partitions	wire	60	M

TOTAL :	posts	10	
	lumber	$66\frac{1}{2}$	
	roofing	122	
	nails	5	kg
	wire	170	M
	cement	$1\frac{1}{2}$	Sacks
if building has concrete floor	cement	16	Sacks

total area of walls and partitions	90	M^2

$105 M^2$:	starter frame	posts	2	units
		lumber	$4\frac{1}{2}$	
		wire	30	M
		nails	$\frac{1}{2}$	kg
		cement	$\frac{1}{2}$	Sack
	5 modules	posts	10	
		lumber	60	
		roofing	150	
		wire	100	M
		nails	5	kg
		cement	$1\frac{1}{2}$	Sack
	3 doors	lumber	9	
		roofing	3	
		nails	1	kg
	bracing	lumber	8	
	end walls and partitions	wire	90	M

TOTAL :	posts	12	
	lumber	$81\frac{1}{2}$	
	roofing	153	
	nails	6	kg
	wire	220	M
	cement	$1\frac{1}{2}$	Sacks
if building has concrete floor	cement	20	Sacks

total area of walls and partitions	130	M^2

120 M^2 : HEALTH CENTER, concrete block

starter frame	lumber	4½	units
	nails	½	kg
8 modules	lumber	96	
	roofing	240	
	nails	8	kg
12 doors	lumber	36	
	roofing	12	
concrete block walls 2400 block	cement	140	sacks
	steel	200	l.m.
cement floor	cement	36	sacks
foundation	cement	50	sacks

TOTAL:	lumber	132	
	roofing	252	
	steel	200	l.m.
	nails	8½	kg
	cement	226	sacks

Note: 1. The Health Center calculations are based on the design illust-
rated in Fig.2. It includes using the basic 7 M truss of the
other buildings which covers a 2 M veranda.
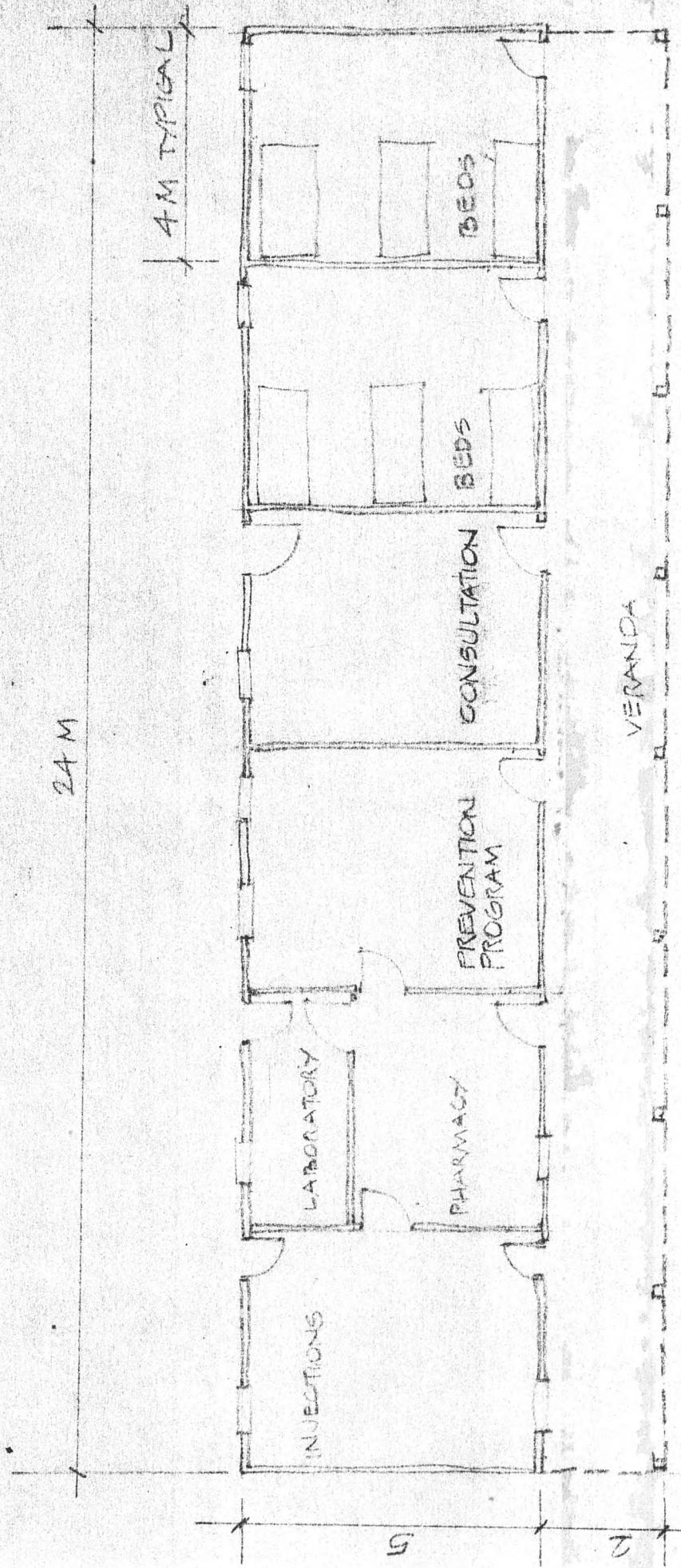The cement sacks are assumed to be 50 kg/sack.

2. Some of the Health Centers will be built of local stone.
For those buildings all of the material quantities will be
the same except cement. Reduce the cement to a total of 105.

REGION/CAMP	Design Population (thousands)	Food Stores (84 m²)				Health Centres (125 m²)				Health Posts (42 m²)				Classrooms (42 m²)				Administrative Offices (27 m²)				Community Centers (42 m²)	Feeding Centers (42 m²)
		Total units needed	Existing semi-permanent units	Units under construction	Units to be started	Total units needed	Existing semi-permanent units	Units under construction	Units to be started	Total units needed	Existing semi-permanent units	Units under construction	Units to be started	Total units needed	Existing semi-permanent units	Units under construction	Units to be started	Total units needed	Existing semi-permanent units	Units under construction	Units to be started	Units to be started	Units to be started
NORTH - WEST	195																						
Damka	45	9.5	2.5	-	7	1	-	-	1	5	-	-	5	42	3	-	39	5	-	-	5	1	1
Agabar	45	9.5	2	4	3.5	1	-	-	1	4	2	-	0	42	3	6	36	5	-	-	5	1	1
Arabsio	3	1	1	-	0	1	-	-	1	1	1	-	0	3	2	-	1	1	1	-	0	1	1
Tug-wajale	2	1	1	-	0	1	-	-	1	1	1	-	0	2	-	-	2	1	1	-	0	1	1
Saba'ad	60	13	-		2	1	-	-	1	8	-	8	0	56	-	6	50	6	-	-	6	1	1
Las Dhure	40	8.5	-	6	2.5	1	-	-	1	6	-	6	0	37	-	-	37	4	-	-	4	1	1
HIRAN	208																						
Crash Programme	10	2	1	1	0	1	-	-	1	1	-	-	0	5	-	-	5	1	-	-	1	1	1
Lugh Jellow	40	8.5	2.5	3	3	1	0.75	-	0.25	6	1	-	5	46	4	-	42	6	-	-	6	1	1
...galow	15	3	1.5	2	0	1	-	-	1	3	-	-	3	18	4	-	14	2	-	-	2	1	1
...okane	40	8.5	-	2	5.5	1	-	-	1	4	-	-	4	33	-	-	33	3	2	-	1	1	1
Amalo	18		1	1	2	1	-	-	1	2	-	-	2	10	-	-	10	1	-	-	1	1	1
Jalalogse I	40	8.5	4	-	4.5	1	-	-	1	7	-	-	7	38	-	-	38	4	-	-	4	1	1
Jalalogse II	45	9.5	1	1	7.5	1	-	-	1	4	1	-	3	42	4	-	38	4	-	-	4	1	1
CORIOLI	52																						
Camps I, II, III	52					3	-	-	3	10	5	1	4	50	5	4	41	8	5	-	3	3	3
GEDO	335																						
Doriolei	20	4	-	-	.4	1	1	-	1	3	-	-	3	19	-	-	19	2	-	-	2	1	1
Ali Matan	45	9.5	1.5	-	8	1	1	-	1	8	4	-	4	42	-	-	42	5	-	-	5	1	1
Halgan	30	6.5	1.5	-	5	1	.5	-	.5	5	1	-	4	28	8	-	20	3	2	-	1	1	1
Horseed	40	8.5	1.5	-	7	1	1	-	1	7	1	-	6	37	5	-	32	4	1	-	3	1	1
Halba I,II	60	13	2	-	11	1	1	-	1	10	1	-	9	56	6	-	50	6	-	-	6	1	1
Bur Dhubo	45	9.5	3.5	-	6	1	.5	-	.5	8	3.5	-	4.5	42	8.5	-	33.5	5	-	-	5	1	1
Suriya	30	6.5	3.5	-	5	1	1	-	1	5	1	-	4	28	-	-	28	3	-	-	3	1	1
Malka Hidey	40	5.5	-	-	5.5	1	1	-	1	7	2.5	-	4.5	37	2.5	-	34.5	4	-	-	4	1	1
Mageney	25					1	1			4			4	23				3	-	-	3	1	1

TOTAL :

HEALTH CENTER

24 M

4 M TYPICAL

BEDS

BEDS

INJECTIONS

LABORATORY

PHARMACY

PREVENTION PROGRAM

CONSULTATION

VERANDA

PLAN 1/100

Figure 2.

MATERIAL SPECIFICATIONS

Wood posts. The wood posts shall be completely impregnated to resist termite infestation. Creosote is not an acceptable treatment. The actual, not nominal, dimension of the posts shall be approximately 9cm x 9cm x 3 M or 10cm in diameter x 3 M or 3½ inches x 3½ inches x 10 feet or 4 inches in diameter x 10 feet.

Lumber. The dimensional lumber shall be completely impregnated to resist termite infestation. Creosote is not an acceptable treatment. The specie and grade of wood shall have a flexural stress value in moment bending of at least $f = 800$ pounds/in^2 or its metric equivalent. The lumber may be rough sawn or planed.
The actual, not nominal, dimensions of the lumber shall be 4cm x 9cm x 4,50 M or 1½ inches by 3½ inches x 16 feet. The width and depth of the lumber may vary by 10%, the lenght by 5%.

Corrugated iron roofing. The roofing sheets shall be completely galvanized iron. The dimensions shall be 2,00 M x 0,65. The gauge shall be at least 28. Thirty or 32 gauge is acceptable.

Wire. The wire shall be provided in rolls of medium gauge approximately 12 to 14 gauge and galvanized.

Steel. The steel shall be 8mm diameter deformed reinforcing bars. They shall be rust free.

Cement. The calculations for cement are based on sacks containing 50 kg each.

Nails. The nails shall be 6cm common nails.

The construction of several hundred separate buildings in 26 different camps in as short a time as possible obviously will require considerable managerial, logistical and supervisory skills and manpower. The following is an outline of recommendations of how some of these skills should be implemented.

Management. It will be critical to assemble a team of people that will assume the management functions. This team should be hired as soon as possible to initiate the construction program. They should be assigned to the National Refugee Office.

The duties of the central manager, working in Mogadishu, will include coordination of all construction projects, receiving the materials into the country, arranging for storage of materials in Mogadishu and the regions, directing the distribution of the building materials, establishing priorities of workload.

There should be regional supervisors in each of the four regions. They will be liaison with the central manager and implement his directives. They also need to be responsible for the quality control of all construction projects in their respective region and provide the supervision of the camp construction supervisor.

Each camp should be assigned a construction supervisor. The exceptions might be those camps that have very little urgent construction needs and where two camps are very close together and may be served by one person. The construction supervisor would be in charge of hiring the construction laborers, overseeing the quality of their work and responsible for construction materials. If buildings are to be built out of stone or concrete block, the construction supervisor needs to be skilled in that type of construction as well.

It is important that the central manager and the regional supervisors work as a cohesive unit with mutually agreed upon objectives, procedures, and standards. The importance of this can not be over emphasized. Consequently, it seems advisable to contract all five positions from a single source, perhaps a volag. It is also essential that they all had a related experience of managing construction in a third world country.

Camp Planning. There is a need for camp planning. The ad hoc camp development has resulted in communal facilities located in very inconvenient and inefficient places. The administration and livability of the camp would be greatly improved through planned siting. This process has already been begun in Gedo with the work of an architect on the Swiss team.

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Recommendation: Hire an architect or planner immediately. His duties would be to analyze all of the camps that have not yet been planned; identify all new construction that needs to be started within this program; identify the site of each of these community facilities. The analysis of the needs for community facilities made by this mission are generally adequate. They are inadequate in terms of a satisfactory knowledge of the size and distribution of health posts and feeding centers. This analysis is a high priority item .

Procurement. The need for the community facilities is very great. Proceding to construct them can only be regarded as a matter of urgency. This urgency must necessarily be extended to the process of procuring the materials.

Recommendation. UNHCR HQ should immediately contract a consultant who is a specialist in the procurement of construction materials on the international market. This person should be able to locate sellers capable of supplying the type and amount of materials available for delivery to a port by a prescribed date. The consultant should also make all the logistical arrangements necessary for the actual purchase of the materials, their delivery to a port, contracting for their shipment to Mogadishu (with the possibility of a partial delivery in Berbera), and ancillary "red tape" matters.

LOGISTICS

Providing direction to the procedure to get the construction materials
to the building site is beyond the scope of this mission. However, I
shall make certain recommendations or observations regarding these
logistics.

A. Health Centers. At the present anticipated schedule it is
unlikely that any building materials ordered in Europe by UNHCR
Headquarters will arrive before November 1. It will then take
at least two months to bring to completion the first buildings
constructed with these materials. For the camps that presently
are without a health center and have no other prospect of
obtaining one before January 1, 1981, an intermediate solution
should be made.

Recommendation. Make a purchase of the materials necessary for
an 84 M^2 building for each camp in urgent need of a health center.
These materials should be purchased immediately from either
Nairobi, Jedda or Djibouti. By implementing this purchase and
construction process as soon as possible it is reasonable to
expect to reduce the time when these vital buildings will become
available by three months. For so few buildings the possible
higher cost for the materials is a small proportion of the entire
budget.
The remaining element of this recommendation is that these buil-
dings would only provisionally be used as the health center.
As the main body of construction materials arrives, the higher
quality more permanent health center will be built.

The provisional health center will be converted to another use.

B. **Local Materials.** As outlined elsewhere in this report the
materials to be ordered by UNHCR HQ do not include any
materials for the wall construction. The walls are intended
to be built from local materials. The actual amount of this
wall construction is very large. If the buildings are const-
ructed with the recommended 7 M wide bays the total area of
wall construction will be approximately 46,000 M^2. If the
buildings were built of the more common width of 4 M the
total wall area could reach 63,000 M^2. This represents
a very large amount of material. In the case of branches for
wattle it is increasingly scarce. The Swiss team reports that
in Gedo people have to go further and further from their camp
to find it. In Hiran, the Deputy Commissioner of the Regional
Refugee Commission reported that all branches need to be trucked
to each camp, from a single source, for a distance of 30 km,
to the closest camp to 100 km from the furthest.

There are, however, alternatives to branches. A good quality
quarried stone is available in Hiran and Gedo and field stone
is available in the North-West. Another, but less desirable
option is concrete block.

Recommendation: An assessment needs to be made in each region
of the quantity of available branches for wattle-and-daub
construction. If there is a shortage of branches it may be
necessary to use large quantities of stone. In fact, the cost
effectiveness of branches versus stone should be examined.
Considering the much longer life of the stone construction
it may prove very desirable.

In any case for those buildings that utilize branches or stone the acquisition of that material should begin as soon as possible. All the branches and stone should be at the building site before the other construction material arrive.

C. <u>Transportation.</u> Preliminary calculations indicate that the amount of materials to be imported will require approximately 60 trips utilizing 20 Ton trucks from the port. As these materials will be distributed to about 26 camps, even more trips may be necessary. There will also be a very large number of trips necessary to transport the branches and stones at the local level.

<u>Recommendation:</u> Make arrangements at this time for all of the trucking requirements.

D. <u>Cement.</u> It is possible some buildings will be constructed of concrete block. Others may be built of stone using cement mortar. These buildings may have concrete floors.
It is further possible that cement may be readily available from Nairobi, Jedda or Djibouti. Even if it would cost more than cement purchased through a central order in Europe it is more important to initiate construction as soon as possible and, therefore, use the regionally available cement.

<u>Recommendation:</u> Minimize the shipment of cement by boat as much as possible because of the deteriorations effects of the moisture. Time the delivery to the construction site to ensure a constant supply. However, the supply should not be so great that the shelf-life of the cement would be reached before it was used.

BUDGET

The budget in the UNHCR Somalia Programme Plan of Operation, 1980 identifies US$4,750,000 for construction of community facilities. From that budget contracts have already been negotiated for the following amounts.

Swedish Disaster Relief Unit	US$ 80,000
Swiss Disaster Unit	250,000
Association Francaise des Volontaires du Progres	280,000
TOTAL:	US$ 550,000

UNHCR is in the process of subcontracting the construction of the staff housing. US$200,000 will be deducted for that purpose. This leaves US$4,000,000 for all remaining construction.
Of the remaining amount, US$700,000 from the Islamic Development Bank shall be spent on the construction of about 26 health centers and 100 health posts, and will be handled by the Ministry of Health under separate contract.

A further amount of US$195,000 has been designated for the purchase of pre-fabricated structures. At this time it is not known if such a purchase has been made. If it has not, it is recommended that it not be made but rather diverted to the purchase of local materials.

It is not possible to calculate exact costs for the purchase of materials, their transport and the other costs involved in this program. For the purpose of assembling a purchase order the following unit prices have been estimated and are used.

Materials

impregnated wood	US$ 345	M^3
corrugated iron roofing	10	sheet
nails	75	100 Kg
wire	60	100 kg
cement	100	M T

Shipping

wood -	125	M^3
corrugated iron roofing	125	M T
other	125	M T

Port handling	5	M T
Transport to camps	400	trip
Labor for health facilities	10	M^2
Labor for general construction	5	M^2
Warehouse rental	- -	

Contingency $\pm$ 15% of US$ 3,300,000 = 495,000

As the final work in this planning was being done, the Government of Somalia reduced the number of classrooms by roughly half, thus considerably reducing the amount of materials required.

Based on the preceding unit costs the following is the proposed budget and purchase order.

Item	Unit Cost	Units	Total
Wood posts	345 M^3	125 M^3	43,125
Lumber	345 M^3	548 M^3	189,060
Corrugated iron roofing	10 sheet	46,084 sheets	460,000
Nails	75-100 kg	1,909 kg	1,432
Wire	60-100 kg	3,208 kg	1,925
Cement	100 M.T.	501 M.T.	50,100
Shipping			
Wood	125 M^3	673 M^3	84,128
Roofing	125 M.T.	276 M.T.	34,500
Other	125 M.T.	506 M.T.	63,250
Port handling	5 M.T.	1,455 M.T.	7,275
Transport to camps	400 per trip	180 trips	72,000
Labor for general construction	5 M^2	40,694 M^2	203,470
Warehouse			25,000
Contingency			495,000
		TOTAL US$	1,731,102

EXPLANATION OF SURVEY OF EXISTING and NEW COMMUNITY FACILITIES FOR 1980

The design of the survey may need some clarification as to how I actually used it.

In the left margin is listed each facility type followed by an area in M^2. This is the standard size as recommended in the Mumtaz report. The total number of these units required in each camp is identified in the far right hand column.

For the purpose of calculating the materials to be purchased for the remaining construction to be started with the 1980 budget I used the following procedure:

1. Calculate the total area of the existing semi-permanent construction and its equivalent number of standard units.

2. Calculate the total area of the buildings under construction and its equivalent number of standard units.

3. Calculate the total number of units required to meet the standards. The total area required has sometimes been noted in pencil in the right hand margin.

4. Subtract the total of the existing semi-permanent construction and the buildings under construction from the total required units.
   This total of units remaining to be built by the 1980 budget is noted in the column "Number of units to be started" in the "Facilities planned by other agencies" section.
   The "dimension meter x meter" box shows the typical size of one unit. In small numbers in the lower right hand corner of that box is noted the total area, that is, required units x dimension of that unit.
   At the bottom of that column is the total area to be built in the camp. It is divided into the $100M^2$ of open shelter and another number for enclosed shelter.

5. The abbreviation C.I. is used for corrugated iron roofing and usually indicates a building that is rated as OK. That is, however, not always the case.

Notes on Building Materials Worksheets

Coming into the process cold with no overlap with Paul Thompson it was necessary to make a few assumptions. He left behind some very good documents which made the follow-up easier.

After reading through his draft report I then proceeded using the Chart on page 17 "Location and Number of Facilities" as my working document. It was necessary, however, to complete the chart with information from Gedo Region and update the information from the North-West Region.

Using this information and Thompson's list of materials for the various sizes and types of buildings I then calculated and posted on a chart for each camp the materials needed for that camp. This was then consolidated on a summary sheet for each Region and finally summarized for the entire projected Construction Program. I then added 10% to the lumber totals and 15% to the cement totals to cover damage in shipment, cement being particularly vulnerable.

You will note two totals given for cement, one for the formulations and one for the floors. This, It seems is the first point to cut back if needed. Some of the buildings could probably serve with tamped earth floors, but some, like Health Centers should have cement floors. Therefore, the low figure assumes no cement floors and the high figure assumes all floors being cement. Adjustments can easily be made working from the data on the Camp worksheets on an item by item basis.

I hope that the above is clear to whomever is charged with follow-up.

July 8th, 1980   H.D. Swartzendruber

ADJUSTMENT	POSTS 4x9cm x 3M	LUMBER 4x9 cm x 4.50 M	C.I. SHEETS	NAILS (kg)	WIRE (Meters) 12-14 gauge	CEMENT (50kg) BAGS	CEMENT	REBAR
REQUEST PER WORKING PAPERS	6,700	47,468	68,945	2,799	101,240	15,938	1,296	435
ADD 35 COMMUNITY CENTER TO 60	+35	210	1,382	2,135	87	3,500	.35	345
REDUCE CLASSROOMS TO 400	-306	-1,836	-18,666	-765	30,600	-306	-2,142	
REDUCE BY ALL HEALTH CENTRES TO 60 HANDLED SEPARATELY	-35	3,300 6,300	-212	—	-5,650	—		
NEW TOTAL	5,074	53,463	76,084	1,909	74,140	10,017	5399	—
	125 M3	548 M3		19.4T	3,208 kg	501 4T		

To Calculate M3 Lumber.

5074 ÷ 21 X 3 = 125 M3
33463 ÷ 7.475 X 450 = 548 M3

SQUARE FEET OF CONSTRUCTION

Coriolei	51 x 42	=	2142
Kokane			1890
Crash			336
Lugh Jellow			2436
Sigalow			882
Amalo	17		714
Jalalogse I	56		2352
" II	55		2310
Damka	58		2436
Agabar	47	·	1974
Arabsio	3		122
Tug Wajale	4		168
Saba'ed	60		2520
Las Dhure	48		2016
Coriolei	40		1680
Ali Matan	60		2520
Halgan	32		1344
Horseed	50		2100
Halba I & II	78	.	3276
Bur Dhubo	50		2100
Suriya	40		1680
Malka Hidey	50		2100
Hageney	38		1596

$$M^2$$

40,694 ~~Sq. ft.~~

x   5

$ 203.470

SUMMARY of BUILDING MATERIALS to be ORDERED

Region:	POSTS 9cm x 9cm x 3M (or 10cm) 3½"x3½"x 10" (w x D)	LUMBER (pieces) 4cm x 9cm x H/50H 1½"x3½" x 16' (actual)	C.I. SHEETS 2.0m x 0.65m 28-32 gauge	NAILS (kgs) 6cm common	WIRE (meters) 12-14 gauge	CEMENT (Bags 50 kgs)		RE-BAR 8mm deformed (rust-free) (meters)
NORTH-WEST	1,352	9,729	15,430	627	22,860	3,180	1,576	1,000
HIRAN	1,617	11,505	18,329	244	29,225	3,598	1,668	1,250
CARIOLI	318	2,493	3,960	157	5,340	1,070	330	660
GEDO	2,804	19,426	31,198	1,271	45,815	6,011	2,370	1,500
TOTAL	6,091	43,153	68,915	2,299	101,240	13,859	6,344	4,350
+10%	6,700	47,468				15,938		
+15%						9,296		

	No. To Be Built	Posts	Lumber	C.I. Sheets	Nails kg	Wire M.	Cement (Found.) Back	Cement (Floor) Back	ReBare
FOOD STORES (84 M²)	1	1	1	1	1	1	1	1	609
HEALTH CENTERS (120 M²)	3	—	396	936	25.5	—	678 include floor	—	
HEALTH POSTS (42 M²)	4	24	158	214	10.	400	4	7	
CLASS ROOMS (42 M²)	41	246	1619.5	2501	102.5	4100	41	287	
DRUG OFFICES (21 M²)	3	12	82.5	93	3.75	240	.5	3.5	
COMMUNITY CENT. (42 M²)	3	18	118.5	163	7.5	300	3	21	
FEEDING CENT. (42 M²)	3	18	116.5	183	7.5	300	3	21	
TOTAL		318	2493	3960	156.75	5340	929.5	339.5	609
								1070	

REGION: HIRAN

CAMPS:	POSTS	LUMBER (PIECES)	C.I. SHEETS	NAILS (KG)	WIRE (M)	CEMENT	RE-BAR
CRASH PROGRAM	46	436	710 / 910	281 / 28	780	287 / 234	200
LUGH JELLOW	348	2333	3604	149	5890	521 / 113	50
SIGALOW	122	938	1473	59	2060	386 / 246	200
KOKANE	203	2066	3333	135	4915	631 / 274	200
AMALO	108	846	1381	55	1820	365 / 235	200
JALALOGSE I	351	2446	3912	159	5865	702 / 283	200
JALALOGSE II	349	2440	3914	159	5895	706 / 283	200

	No. To Be Built	Posts	Lumber	C.I. Sheets	Nails	Wire	Cement (Found.)	Cement (Floor)	Re: 840
Food Stores (84 m²)	5.5	55	366	671	27.5	935	8.5	80	
Health Centers (120 m²)	1	1	132	252	8	1	226 includes floor		
Health Posts (42 m²)	4	24	158	244	10	400	4	28	
Class Rooms (42 m²)	33	198	1303.5	2013	82.5	3300	33	231	
Admin. Offices (21 m²)	1	4	27.5	31	1.5	80	.5	3.5	
Community Cent. (42 m²)	1	6	39.5	61	2.5	100	1	7	
Feeding Cent. (42 m²)	1	6	39.5	61	2.5	100	1	7	
TOTAL	29.3		2066	3333	135	4915	274	356.5	631

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS kg	WIRE m	CEMENT (FOUND) Octa	CEMENT (FLOOR) Octa	R. Bar
FOOD STORES (84 M²)	1	—	—	—	—	—	—	—	
HEALTH CENTERS (120 M²)	1	—	132	252	8.5	—	226 include floor		
HEALTH POSTS (42 M²)	—	—	—	—	—	—	—	—	
CLASS ROOMS (42 M²)	5	30	197.5	305	12.5	500	5	35	
ADMIN. OFFICES (21 M²)	1	4	27.5	31	1.5	80	.5	3.5	
COMMUNITY CENT. (42 M²)	1	6	39.5	61	2.5	100	1	7	
FEEDING CENT. (42 M²)	1	6	39.5	61	2.5	100	1	7	
TOTAL	716	436	710	26.5	480	233.5	5215	287	800

REGION: HIRAN

CAMP: LUGH JELLOW

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)	Re-Bar
FOOD STORES (84 m²)	3	30	199.5	366	15	510	4.5	43.5	
HEALTH CENTERS (120 m²)	.25	-	33	63	2.5	-	5615 purchased		
HEALTH POSTS (42 m²)	5	30	197.5	305	12.5	500	5	35	
CLASS ROOMS (42 m²)	42	252	1659	2562	105	4200	42	294	
ADMIN. OFFICES (21 m²)	6	24	165	186	9	480	3	21	
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7	
FEEDING CENT. (42 m²)	4	6	39.5	61	2.5	100	1	7	
TOTAL		348	2333	3604	149	5890	113	4075	582

Region: HIRAN   Camp: SIGALOW

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)	Re Bar
FOOD STORES (84 M²)	1	1		1	1	1		1	
HEALTH CENTERS (120 M²)	1	—	132	252	8.5	—	22 (sprinkled floor)	1	
HEALTH POSTS (42 M²)	3	18	118.5	183	7.5	300	3	21	
CLASS ROOMS (42 M²)	14	84	553	854	35	1400	14	98	
ADMIN. OFFICES (21 M²)	2	8	55	62	2.5	160	1	7	
COMMUNITY CENT. (42 M²)	1	6	39.5	161	2.5	100	1	7	
FEEDING CENT. (42 M²)	1	6	39.5	161	2.5	100	1	7	
TOTAL		122	9375	1473	58.5	2060	246	140	200
								380	200

REGION: HIRAN   **CAMP: AMALO**

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)
							Rs. Bag	Rs. Bag
FOOD STORES (84 m²)	2	20	133	244	10	340	3	29
HEALTH CENTERS (120 m²)	1	—	132	252	8.5	1	226 include floor	
HEALTH POSTS (42 m²)	2	12	79	122	5	200	2	14
CLASS ROOMS (42 m²)	10	60	395	610	25	1000	10	70
ADMIN. OFFICES (21 m²)	1	4	29.5	31	1.5	80	.5	3.5
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7
FEEDING CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7
TOTAL		108	846.5	1381	55	1820	234.5	130.5
								365

REGION: HIRAN   CAMP: JALALOGSG I

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS Kgs	WIRE H.	CEMENT (Found.) *Pcs* / *Ka Bac*	CEMENT (Floor) *Pcs*
FOOD STORES (84M²)	45	45	299.5	549	22.5	765	5.5	62
HEALTH CENTERS (120 M²)	1	1	132	252	8.5	–	226 includes floor	
HEALTH POSTS (42M²)	7	42	276.5	427	17.5	700	7	49
CLASS ROOMS (42 M²)	38	228	1501	2318	95	3800	38	266
ADMIN. OFFICES (21 M²)	4	24	158	244	10	400	4	28
COMMUNITY CENT. (42 M²)	1	6	39.5	61	2.5	100	1	7
FEEDING CENT. (42 M²)	1	6	39.5	61	2.5	100	1	7
TOTAL		351	2446	3912	1558.5	5865	2822.5	477

REGION: HIRAN

CAMP: JALALOGSE II

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)	Re Bar
FOOD STORES (84 m²)	7.5	75	499	915	37.5	1875	11..	109.15	
HEALTH CENTERS (120 m²)	1	—	132	252	8.5	—	226 includes floors		
HEALTH POSTS (42 m²)	3	18	118.5	183	9.6	300	3	21	
CLASS ROOMS (42 m²)	38	228	1501	2318	95.0	3800	38	266	
ADMIN. OFFICES (21 m²)	4	16	110	124	5	320	2	14	
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	9	
FEEDING CENT. (42 m²)	1	6	39.5	61	2.5	100	1	9	
TOTAL	34g	349	2439.5	3914	169.5	5895	282	424	200

Region: NORTHWEST

CAMPS:	POSTS	LUMBER (PIECES)	C.I. SHEETS	NAILS (Kg.)	WIRE (M)	CEMENT	RE-BAR
DAMKA	366	2552	4007	166	6190	726 / 285	200
AGABAR	286	2039	3213	131	4880	615 / 273	200
ARABSIO	18	251	435	16	300	250 / 229	200
TUG-WAJALE	24	290	496	19	400	258 / 230	200
SABA'AD	356	2484	3854	158	6020	698 / 284	200
LAS DHURE	300	2115	3365	137	5070	633 / 275	200
TOTALS	1352	9729	15430	627	22,860	3720 / 1576	1200

REGION: NORTH-WEST   CAMP: DAMKA

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)		Od6	(Re-Bar)
FOOD STORES (84m²)	7	70	465.5	854	35	1190	10.5	10.5			
HEALTH CENTERS (120m²)	1	-	132	252	8.5	-	226 includes floor/plan				
HEALTH POSTS (42m²)	5	30	197.5	305	12.5	500	5	35			
CLASS ROOMS (42m²)	39	234	1540.5	2379	97.5	3900	39	273			
ADMIN. OFFICES (21m²)	5	20	199.5	155	7.5	400	2.5	17.5			
COMMUNITY CENT. (42m²)	1	6	39.5	61	2.5	100	1	7			
FEEDING CENT. (42m²)	1	6	39.5	61	2.5	100	1	7			
TOTAL		366	2552	4067	164	6190	265	441			726

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)
							300	Re 15/Bar
FOOD STORES (84 m²)	475	410	266	488	20	680	6	58
HEALTH CENTERS (120 m²)	1	—	132	252	8.5	—	226 includes gtrs	1
HEALTH POSTS (42 m²)	—	—	—	—	—	—	—	—
CLASS ROOMS (42 m²)	36	216	1422	2196	90	3600	36	252
ADMIN. OFFICES (21 m²)	5	20	137.5	155	7.5	400	2.5	17.5
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	?
FEEDING CENT. (42 m²)	1	6	39.5	61	2.5	100	1	?
TOTAL	288		2036.5	3213	131	4880	272.5	341.5
						6151		300

REGION: NORTH WEST   CAMP: ARABSIO

	No. To Be Built	Posts	Lumber	C.I. Sheets	Nails	Wire	Cement (Found.)	Cement (Floor)	Rc Rm
FOOD STORES (84 m²)	1	1	1	1	1	1	1	1	200
HEALTH CENTERS (120 m²)	1	1	181	252	318	1	226	226 metric tons	1
HEALTH POSTS (42 m²)	–	–	–	–	–	–	–	1	
CLASS ROOMS (42 m²)	1	6	39.5	61	2.5	100	1	7	
ADMIN. OFFICES (21 m²)	–	–	–	–	–	–	–	1	
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7	
FEEDING CENT. (42 m²)	1	6	39.5	61	2.5	100	1	2	2
TOTAL		18	250.5	435	16	300	229	250	200

Region: NORTHWEST

CAMP: TUG-WAJALE

	No To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found)	CEMENT (Floor)	R.Bk
FOOD STORES (81m²)	1	—	—	—	—	—	—	—	—
HEALTH CENTERS (120m²)	1	—	132	252	8.5	—	2.26 bundles filled	—	—
HEALTH POSTS (42m²)	1	—	—	—	—	—	—	1	1
CLASS ROOMS (42m²)	2	12	29	122	5	200	2	14	—
ADMIN. OFFICES (21m²)	1	—	—	—	—	—	—	—	—
COMMUNITY CENT. (42m²)	1	6	39.5	61	2.5	100	1	7	—
FEEDING CENT. (42m²)	1	6	39.5	61	2.5	100	1	7	—
TOTAL	28	290	464	185.5	400	230	28	208	2.08

REGION: NORTH-WEST   **CAMP:** SABA'AD

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found)	CEMENT (Floor)	Re-Bar
FOOD STORES (84 m²)	2	20	133	244	10	340	3	29	
HEALTH CENTERS (120 m²)	1	-	132	252	8.5	-	226 includes floor		
HEALTH POSTS (42 m²)	-	1	-	-	-	-	-	1	
CLASS ROOMS (42 M²)	50	300	1975	3050	125	5000	50	350	
ADMIN. OFFICES (31M²)	6	24	165	186	9	480	3	21	
COMMUNITY CENT. (42M²)	1	6	39.5	61	2.5	100	1	2	
FEEDING CENT. (42M²)	1	2	39.5	61	2.5	100	1	2	
TOTAL		356	2484	3854	1575	6020	284 / 698	414	900

Region: NORTH-WEST   CAMP: LAS DHURE

	No. To Be Built	Posts	Lumber	C.I. Sheets	Nails	Wire	Cement (Found)	Cement (Floor)	ReBar
Food Stores (84 m²)	5	50	332.5	610	25	850	7.5	72.5	
Health Centers (120 m²)	1	-	132	252	8.5	-	226 schedule flow		800
Health Posts (42 m²)	-	-	-	-	-	-	-	-	
Class Rooms (42 m²)	37	222	1461.5	2257	925	3700	37	259	
Admin. Offices (21 m²)	4	16	110	124	6	320	2	12	
Community Cent. (42 m²)	1	2	39.5	61	2.5	100	1	7	
Feeding Cent. (42 m²)	1	6	39.5	61	2.5	100	1	7	
TOTAL	300	2115	3365	137	5070	2174.5	357.5	800	

CAMPS:	RE-BAG	CEMENT		WIRE (T)	NAILS (Kg)	C.I SHEETS	LUMBER (PIECES)	POSTS
DOKIOLEI	200	489	257	3240	982	2216	1401	192
ALI MATAN	200	759	289	6560	176	4311	2698	388
HALGAN	100	518	260	3530	100	2479	1519	210
HORSEED	200	670	278	4530	148	3639	2260	382
HALBA I, II	200	962	811	8960	240	5867	3688	500
BUR DHUBO	—	550	165	5420	143	3455	2184	382
SURIYA	260	558	266	4150	113	2785	1757	346
MALKA HIDEY	200	946	279	5350	146	3610	2243	322
MAGENEY	200	559	263	4075	113	2776	1726	242
TOTALS	1500	8011	21370	45,515	1,271	31,198	19,426	2804

REGION: GEDO   CAMP: DORIOLEY

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)	ReBar
FOOD STORES (84 m²)	4	40	266	488	20	680	6	5'8	
HEALTH CENTERS (120 m²)	1	—	132	252	8.5	—	226 include floor		800
HEALTH POSTS (42 m²)	3	18	118.5	183	9.5	300	3	21	
CLASS ROOMS (42 m²)	19	114	7505	1159	47.5	1900	19	133	
ADMIN. OFFICES (21 m²)	2	8	55	62	3	160	1	6	
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7	
FEEDING CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7	
TOTAL		192	1401	2266	91.5	3240	257	232	300
							469		800

REGION: GEDO   CAMP: ALI MATAN

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found)	CEMENT (Floor)	Re Bar
FOOD STORES (84 M²)	8	80	532	976	40	1360	12	116	
HEALTH CENTERS (120 M²)	1	-	132	252	8.5	-	226 includes floor		
HEALTH POSTS (42 M²)	4	24	158	244	10	400	4	28	
CLASS ROOMS (43 M²)	42	252	1659	2562	105	4200	42	294	
ADMIN. OFFICES (21 M²)	5	20	137.5	155	7.5	400	2.5	17.5	
COMMUNITY CENT. (42 M²)	1	6	39.5	61	2.5	100	1	2	
FEEDING CENT. (42 M²)	1	6	39.5	61	2.5	100	1	2	
TOTAL		38K	2697.5	4311	176	6540	288.5	4692.5	259 000

REGION: GEDO **CAMP: HALGAN**

	No. To Be Built	Posts	Lumber	C.I. Sheets	Nails	Wire	Cement (Found)	Cement (Floor)	Rt Bar
Food Stores (84 m²)	5	50	332.5	610	25	850	7.5	72.5	100
Health Centers (120 m²)	.5	1	132	252	8.5	1	226 include floor		
Health Posts (42 m²)	4	24	158	244	10	400	4	28	
Class Rooms (48 m²)	20	120	790	1220	50	2000	20	140	
Admin. Offices (21 m²)	1	4	22.5	31	1.5	80	.5	3.5	
Community Cent. (42 m²)	1	6	39.5	61	2.5	100	1	7	
Feeding Cent. (42 m²)	1	6	39.5	61	2.5	100	1	7	
TOTAL		210	1519	2479	100	3530	260	258	100

REGION: GEDO   **CAMP: HURSEED**

	No To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)	Re Bar
FOOD STORES (84 m²)	7	70	465.5	854	35	1190	10.5	10.5	
HEALTH CENTERS (120 m²)	1	1	132	252	8.5	–	226 nichols glan		20 20
HEALTH POSTS (42 m²)	6	36	237	366	15	600	6	42	
CLASS ROOMS (42 m²)	32	192	1264	1952	80	3200	32	224	
ADMIN. OFFICES (21 m²)	3	12	82.5	93	7.5	240	1.5	10.5	
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	1	
FEEDING CENT. (42 m²)	1	6	39.5	61	2.5	100	1	1	
TOTAL		322	2260	3639	148	4530	278	392	208
							620		

REGION: GEDO   CAMP: HALBA I, II

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found)	CEMENT (Floor)	Re Bar
FOOD STORES (84M²)	11	110	931	1708	70	2380	21	203	
HEALTH CENTERS (120M²)	1	—	132	2.52	8.5	—	226 whole floor		
HEALTH POSTS (42M²)	9	54	355.5	549	22.5	900	9	63	
CLASS ROOMS (40M²)	50	300	1975	3050	125	5000	50	350	
ADMIN. OFFICES (21M²)	6	24	165	186	9	480	3	21	
COMMUNITY CENT. (42M²)	1	6	39.5	61	2.5	100	1	2	
FEEDING CENT. (42M²)	1	7	39.5	61	2.5	100	1	2	
TOTAL		500	3637.5	5867	240	8960	311	651 962	

REGION: GEDO   CAMP: BUR DHUBO

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found)	CEMENT (Floor)
FOOD STORES (84 m²)	6	60	399	732	30	1020	9	87
HEALTH CENTERS (126 m²)	.5	1	66	126	4.5	—	113 include floor	
HEALTH POSTS (42 m²)	4.5	28	178	276	11.5	450	4.5	31.5
CLASS ROOMS (42 m²)	33.5	202	1324	2044	84	3350	33.5	234.5
ADMIN. OFFICES (21 m²)	5	20	137.5	165.5	7.5	400	2.5	17.5
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7
FEEDING CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7
TOTAL	38.2	383	2163.5	3455	142.5	5420 / 5550	164.5	384.5

REGION: GEDO   CAMP: SUKIYA

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)	Re Bar
FOOD STORES (84M²)	3	30	199.5	366	15	510	4.5	43.5	
HEALTH CENTERS (120M²)	1	–	132	252	8.5	–	226 included	floor 300	
HEALTH POSTS (42M²)	4	24	158	244	10	400	4	28	
CLASS ROOMS (42M²)	28	168	1106	1708	70	2800	28	196	
ADMIN. OFFICES (21M²)	3	12	82.5	93	4.5	240	1.5	10.5	
COMMUNITY CENT. (42M²)	1	6	39.5	61	2.5	100	1	2	
FEEDING CENT. (42M²)	1	6	39.5	61	2.5	100	1	2	
TOTAL		246	1757	2785	113	4150	266	292	200

REGION: GEDO

CAMP: MAGENEY

	No. To Be Built	POSTS	LUMBER	C.I. SHEETS	NAILS	WIRE	CEMENT (Found.)	CEMENT (Floor)	Re. Bar
FOOD STORES (84 m²)	5.5	56	366	672	27.5	935	8.5	80	
HEALTH CENTERS (120 m²)	1	-	132	252	8.5	-	226 individuals plan		200
HEALTH POSTS (42 m²)	4	24	156	244	10	400	4	28	
CLASS ROOMS (42 m²)	23	138	908.5	1403	57.5	2300	23	161	
ADMIN. OFFICES (21 m²)	3	12	82.5	93	4.5	240	1.5	10.5	
COMMUNITY CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7	
FEEDING CENT. (42 m²)	1	6	39.5	61	2.5	100	1	7	
TOTAL	242	1726	2786.5	4075	113.0		265	293.5	200

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