



**AIR FORCE HANDBOOK 10-222, VOLUME 22
15 JUNE 2000**

REFUGEE CAMP PLANNING AND CONSTRUCTION HANDBOOK



DEPARTMENT OF THE AIR FORCE

**BY ORDER OF THE
SECRETARY OF THE AIR FORCE**

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Operations



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CONSTRUCTION HANDBOOK***

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This handbook describes the range of planning and construction activities associated with contingency refugee operations. It is designed to augment Air Force Instructions, the United Nations High Commissioner for Refugees (UNHCR) *Handbook for Emergencies*, and the United States Agency for International Development (USAID) *Field Operations Guide*. Nothing in this handbook is directive or mandatory, but presents ideas and concepts to consider throughout the initial planning phase and construction phase. This handbook is intended for use by deployed military, civilian and contractor personnel who may be tasked to plan and build a refugee camp.

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INTRODUCTION



Figure 1. Camp Hope, Fier, Albania. A large refugee camp may require extensive infrastructure systems as well as significant perimeter and internal security measures.

References, Abbreviations, Acronyms and Terms. Related publications, references and directives are listed in Annex A. Abbreviations, acronyms and terms used in this handbook are listed in Annex B.

Purpose. As a part of Military Operations Other Than War (MOOTW), humanitarian missions differ markedly from build up and sustainment of combat operations. This handbook addresses actions necessary to most effectively and efficiently establish and develop a refugee camp. It is meant to be used primarily as a field guide by deployed military, civilian, and contract engineer forces in planning and meeting tight construction schedules for refugee camp buildup. It

discusses refugee camp planning, construction including design, and some operations aspects, demobilization, and a range of support activities. It also addresses organizational issues at both field and command levels. This handbook capitalizes on lessons learned during recent operations in the Balkans and builds on experience in Cuba, Haiti and Guam. It presents the material in a format that is usable for future missions. Nothing in this handbook is directive or mandatory. Where appropriate, however, references have been made to Air Force Instructions (AFIs) and other mandatory compliance directives.

Scope. This handbook presents concepts, methods, standards and related considerations for planning and construction and certain operations associated with refugee camps. It is not intended to be a cookbook but rather a document that will inspire additional thought during the planning and construction phases of a refugee contingency operation. The intent is to incorporate the issues and lessons learned during the construction of Camp Hope and Camp Eagle in Albania as part of Joint Task Force (JTF) SHINING HOPE. By using these examples, our future engineering efforts in refugee camp design and construction can be enhanced whether the camp is to be constructed using Air Force, contractor or other personnel and equipment.

Background. In the spring of 1999, Serbian aggression in the Balkans forced hundreds of thousands of ethnic Albanians to flee Kosovo and seek refuge in the neighboring countries of Macedonia, Montenegro and Albania. These countries were neither prepared for nor able to absorb the social and economic impact of the event. Neither could they adequately feed and shelter the constant stream of refugees. As the world focused on the plight of the fleeing Kosovar people, several nations rushed to build refugee camps and tent cities to provide immediate shelter and security. United States Air Forces in Europe (USAFE) was designated the executive agent for construction of

U.S.-funded camps under JTF SHINING HOPE. HQ USAFE/CE, using the Air Force Contract Augmentation Program (AFCAP) contract, planned and built one large camp and started construction on two others before the Serbs signed a peace accord. Initially, all camps were planned and designed to the U.S. Agency for International Development (USAID) standards contained in their Field Operations Guide, Volume 3. Significant changes in camp design were subsequently needed to accommodate the culture of camp inhabitants, various requirements of the Non-Government Organizations (NGOs) charged with operating and maintaining the camps, as well as local conditions. In addition, the USAID standards dealt primarily with construction of refugee camps in Africa and Asia, where the majority of NGO refugee camp experience resides. Almost no standards were given for European refugees where different social and ethnic traits mandated changes in camp planning. Building, securing and operating the camps was a lesson in itself. This publication captures the knowledge and lessons-learned during that project and presents the information in a form that will be useful for future refugee camp projects. While it is understood that every refugee situation is unique, the information presented in this handbook provides a base-line of standard guiding principles and engineering thought.

Assumptions.

- ➔ The United Nations High Commissioner for Refugees (UNHCR) and a number of NGOs will be involved in refugee camp construction and follow-on management and sustainment.

- ➔ Refugee camps housing populations greater than 5,000 refugees will probably be built in increments that allow refugee occupation in stages prior to completion of the entire camp.

- ➔ Refugee camp planning, construction, and sustainment may be accomplished using military forces only, a combination of military

and civilian forces, contract augmentation forces only, or any combination of military, civilian, and contractor forces.

General Planning Considerations.

MOOTW Principles. Success in any refugee camp operation will depend heavily on the principles expounded in general for MOOTW operations in both Joint Publication 3-07 and Air Force Doctrine Directive 2-3. It is incumbent on the Joint Task Force Commander or other senior command element to define the objective in attainable terms and communicate it to all concerned with the operation. Probably the single most important concept to grasp at the planning stage and carry throughout construction is mission focus or unity of effort toward the objective. Everyone involved with the mission needs to understand and agree to work toward the objective or it won't happen as it should. Unlike combat operations where unity of command impacts military units only, a humanitarian effort will involve disparate civilian organizations. Many of these groups will possess nothing more than a general focus, and unique organizational goals and agendas. Some of these organizations (though well-established with humanitarian aid experience) may not understand nor grasp the fundamentals and importance of streamlined organizational traits and teamwork. At the planning stage, establishing open communications can foster the critical unity of effort necessary for all organizations to be successful. This also sets the stage for clarity of mission and focus during the construction phase. Dynamic military leadership, particularly on the part of the camp commander, at the operations level can promote the needed unity between military units and appropriate civilian organizations. Ineffective leadership at this level can destroy the project and make it impossible to meet the objective. Don't underestimate the need to bring everyone together and focus on the mission.

Time Constraints. Refugee camp planning and construction will very likely be done under intense time constraints to meet very aggressive construction schedule commitments. It is safe to assume that normal military mobilization processes and schedules will be of little use during a refugee crisis. This is due in part to the onset speed and unpredictability of situations such as regional war, natural disaster, and other health endangering situations that can lead to the displacement of whole populations and in part to the amount of involvement by governments and agencies external to the Air Force. Preplanning is critical to avoiding last minute panic, however, planners should expect very little preplanning time.

Flexibility. Another likelihood during a refugee crisis is that “firm” requirements will often change. Like any contingency operation, critical planning factors that are unknown during the planning stage can have significant impacts on the project as the operation progresses. For example, during the construction of one camp in Albania, it became apparent that the site chosen for the camp was part of an artificially flooded former collective farm. The Albanian Government had been opening floodgates on a specified date for fifty years and it had become a habit. The imposed flooding negated the effectiveness of all of the drainage systems that had been carefully engineered to deal with storm water runoff. The solution was relatively simple – negotiate with the local authorities to reduce the irrigation water inflow and increase discharge pumping cycles which route the water out to sea. It is necessary to recognize and act early on problems such as this since negotiations may take some time. This example also illustrates the importance of conducting a proper, thorough site survey early on in the planning process. This particular camp's site survey was conducted in less than a day, and did not incorporate engineering expertise among the participating team members.



Figure 2. Emergency Drainage Ditch. Site drainage (along with potable water and sanitation) is one of the most critical factors for safety and comfort of refugee populations.

Surprises will happen and the resilient planner will learn to expect change and deal with them appropriately. The same is true at the site. Additional planning takes place at the site and is driven by a wide range of variables that were probably unknown when the initial planning was conducted. Refugee camps, as part of contingency operations, require flexibility for mission success. During the process of refugee camp construction, several elements may change, including key personnel (both military and civilian), assigned agency responsibilities, and even entire governments. As a result, design requirements, schedules, material availability, logistics, site access, and other factors may be affected.

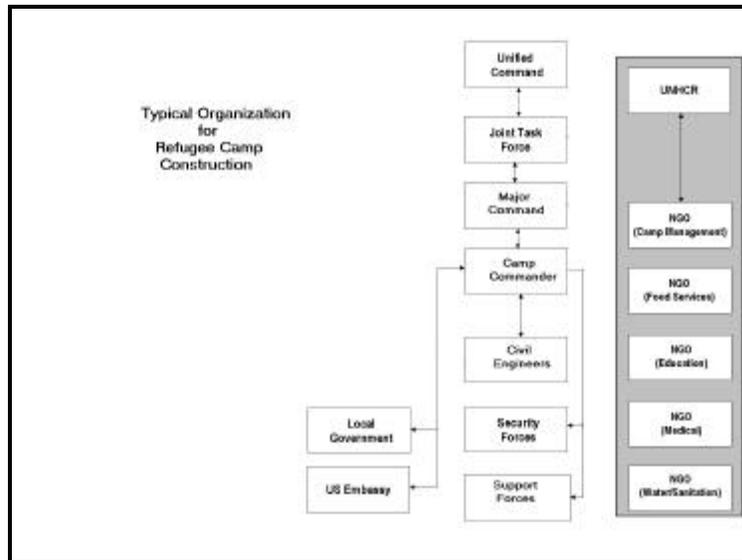


Figure 3. Typical Organization.

Organization, Command and Control, and Authority. Most camp construction operations will occur in a remote location. Consequently, the Air Force and other U.S. military organizations on-site will be critical to successfully carrying out the project. RED HORSE, Prime Base Engineer Emergency Force (BEEF) or other construction units will be sized and equipped to accomplish the construction task at hand. Some examples of the types of tasks required may include specifying material, directing contractor activity, negotiating with the local government, and reporting. The on-site organization and engineer elements will have the most current and intimate knowledge of local conditions – and will be under tremendous time pressure to meet construction schedules and material shipping schedules. Their

authority should be commensurate with their responsibility. The site organization and procedures used if a contractor is involved in planning and constructing the camp are contained in Annex C.

Coordination with Other Interested Parties. Within the military, clear lines of authority will be established and communicated by written orders. Coordination with civilian contractors and NGOs through contracts, formal agreements, preliminary planning meetings and on-site coordination meetings is essential to ensure that all parties stay focused on the mission goals as well as understand each others' roles and responsibilities.

Operations and Maintenance (O&M). The Air Force may be required to assume total responsibility for the operation of the camp, as was the case in Cuba. In that event, all normal support activities associated with running a large tent city must be provided. Considerations such as security, feeding, sanitation, water supply, distribution and wastewater management, electric power production and distribution, facilities maintenance, and fire prevention become of paramount importance and must be figured into continuing planning.

However, the Air Force may not be involved in sustained operations and maintenance of refugee camps. In this case, Non-Government Organizations under the general management of the United Nations High Commissioner for Refugees will probably assume these responsibilities. Responsibility for O&M should be included in the initial orders and procedures developed simultaneously with camp buildup. Typically, within the NGO community, no single organization will be "in charge." Understanding the functions, responsibilities and interrelationships between separate NGOs may also prove challenging due to the number and diversity of NGOs worldwide. The Union of International Associations (UIA) (<http://www.uia.org>) currently lists more than 5,200 organizations throughout the world selected from a list

of more than 24,000 international non-government organizations. There are “specialist” organizations that deal with particular social issues and will specialize in camp O&M functions; such as water/sanitation, food programs, medical, education and general management. Various NGOs are active only in certain regions of the world.

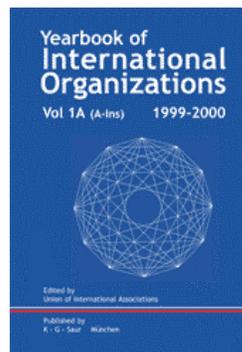


Figure 4. International Organizations. The UIA Annual Yearbook contains more than 6,200 pages of detailed NGO information.

Roles and Responsibilities.

Camp Commander – The camp commander is in charge of all military personnel assigned to the site and is primarily responsible for the military operational aspects of the project, liaison functions, overall coordination between activities and units, and focus on the project objective from a support and facilitation posture. This individual is also responsible for establishing rules of engagement in accordance with a host nation Status of Forces Agreement (SOFA) or equivalent Memorandum of Agreement (MOA). The

camp commander should be a senior officer with operations experience. This individual is the primary interface between all interested parties and should possess good leadership, management and personal skills to bring the diverse groups together for a common cause.

Civil Affairs (or Civil-Military Affairs) – This group is the principal liaison between the local civilian population and deployed military units. This group may augment public affairs, Host Nation Government liaison, and coordination with the NGOs and Host Nation/contractor relationships. This unit may also be referred to as the Civil Military Operations Center (CMOC).

Security – Contingency operations in foreign areas normally require force protection measures throughout the period of construction. This will be true whether the operations are conducted in a hostile zone or simply in an area remote from a significant U.S. force presence. The security issues present during refugee camp construction include protection for U.S. forces and equipment, protection of contractor personnel and resources, and protection of refugee populations. Threat potential may range from hostile enemy action to common thievery of equipment and supplies. Security concerns may include perimeter protection, operation of traffic control points and site access control, intelligence, counter intelligence, and communications security (COMSEC) and operations security (OPSEC). Security operations will be guided by established rules of engagement in accordance with applicable SOFAs or MOAs.



Figure 5. Observation Post. Local features can provide advantages for extended security operations – in this case, an elevated position for Marine sniper teams assigned to the perimeter of Camp Hope, Fier, Albania.

Other Official Interested Parties This group includes other units in the area of responsibility, headquarters activities that are not in the direct command and control structure, political groups, Congressional or Executive Department agencies, and host nation government offices, not directly involved in the project:

Unified Command – Refugee contingency operations will occur in a unified command. The unified commands include United States European Command (USEUCOM), United States

Southern Command (USSOUTHCOM), Joint Forces Command (JFCOM), United States Central Command (USCENTCOM), and United States Pacific Command (USPACOM). Joint operations may be carried out in one or more unified commands. In these cases, the Air Force role may be one of participation in a joint task force, working with security, transportation, or Air Force engineer units such as Prime BEEF or RED HORSE.

Joint Task Force (JTF) – The unified commander may form a joint task force whose mission includes camp construction. In that event, the JTF becomes the focal point for all camp construction coordination.

USAF Major Command (MAJCOM) – The USAF MAJCOM in whose area of operations the camp is to be built will provide the Air Force civil engineering oversight of the project.

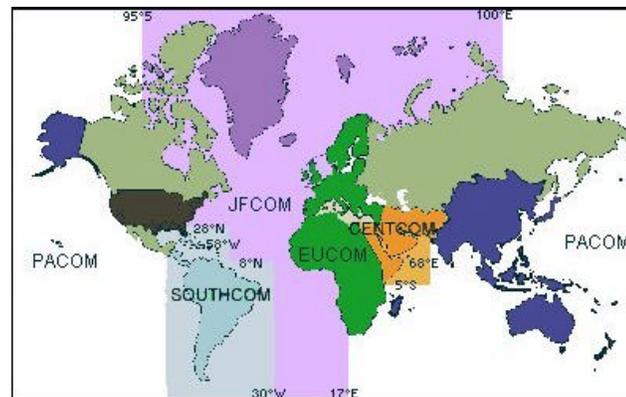


Figure 6. Unified Commands. Refugee operations may occur anywhere in the world.

UNHCR – The United Nations High Commissioner for Refugees provides protection and assistance to the world's refugees. First created by the United Nations General Assembly in 1951, the UNHCR was charged primarily with resettling 1.2 million European refugees left homeless in the aftermath of World War II. Today, 22.7 million people in over 140 countries fall under UNHCR's concern. UNHCR protects, assists, and seeks permanent solutions for refugees in a variety of ways. To carry out its protection function, for example, it promotes adherence to international agreements on refugees and constantly monitors compliance by governments. UNHCR staffs work in capital cities and in remote camps and border areas, attempting to provide protection and to minimize the threat of physical attack. Along with its protection role, UNHCR assists refugees by coordinating the provision of shelter, food, water, sanitation and medical care in emergency situations.

Preliminary Planning Considerations. As early as possible during the pre-planning stages, it will be beneficial to find out as much as possible about the destination country and local site. Today, the internet provides the fastest means to access information – from official U.S. Government sites to host nation sites. At this stage, consideration should be given to operational security (OPSEC). Active inquiries to host nation websites or people could telegraph details of the impending mission. A partial list of helpful websites is shown in Annex D. This list is intended only as an example and researchers should update their references often due to the changing nature of the web.

REFUGEE CAMP PLANNING



Figure 7. A Typical Kosovar Albanian Refugee Family.

Planning Factors. The planning factors used throughout this handbook were extracted from the USAID Field Operations Guide, Volume 3, the UNHCR Handbook for Emergencies, the Sphere Project Humanitarian Charter and Minimum Standards in Disaster Response, the lessons learned during the Operation SUSTAIN HOPE construction effort and other reference documents listed in Annex A. Annex D contains a table of internet websites useful for planning.

Planning Process. Planning for refugee contingency operations is a non-linear process. New concepts, requirements and ideas will constantly be introduced and planners should be prepared to adjust accordingly. Major Command (MAJCOM) authorities should carefully consider the level of autonomy granted to planners. In contingency operations, plan approval must be obtained quickly. A planning cell that is overburdened with reporting and submission of plans for approval through several layers cannot be responsive or effective. As the number of “interested parties” grows, the potential to cripple the planning process grows. Even as plans and designs are approved and the construction phase begins, planners will continue to address new problems and changes that arise during the operation. Forcing the “work to fit the plan” may ultimately lead to the failure to achieve some or all of the objectives of the operation. Hence, flexibility and thinking “outside of the box” should be guiding principles.

Participants in Planning Functions. Refugee camp planning may involve Air Force, joint task force, or allied participants. Outside agencies or groups should be involved as early as possible. These may include representatives from various NGOs, UNHCR, USAID, Department of State, the contractor, host nation officials and other groups directly involved in the operation. Early involvement with specific decision-making groups may also preclude problems and limit the number of changes made as planning moves forward. These groups need to make their interests and requirements known to planners early so that their requirements will be more appropriately addressed during development of the plans. **In particular, the NGO designated to operate the camp or the UNHCR should be involved in planning, as design issues are addressed.**

Working with Non-Government Organizations (NGO).

Working as part of a joint group made up of government agencies, the U.S. military, NGOs, local businesses and subcontractors and

the U.S. Government's prime contractor can be a challenging environment. NGOs will likely bring their own independent goals and agendas to the situation. But it is critical that the U.S. military address NGO concerns and incorporate their requirements into the plan because they will require NGO "buy-in" to the plan. This must be accomplished while ensuring military objectives are met. This can be challenging since NGOs do not fall under one chain-of-command and may not be as well organized as military personnel. Military personnel who will work closely with NGOs will need to use finesse when communicating in order to achieve their objectives. However challenging, everyone must make every effort to form a cohesive and effective team as quickly as possible. The planning effort will be formidable and require that plans be completed on time and presented for comment and approval by all interested parties. Everyone reviewing the plans must know and meet the strict milestones for review and approval that have been established. Once plans receive final approval, everyone involved must put their full support behind successfully executing the approved plans. When changes are necessary, change orders must be documented, reviewed, and approved before procurement and construction can take place. The planning cell should also be aware that the designated NGOs may change during planning and that if a number of NGOs are involved, conflicting requirements may be presented for camp design, security issues, fire prevention, access and layout. The project manager, site manager and the chief planner need to remain vigilant to include the right mix of people and stay attentive to the planning schedule. Identification of and contact with all interested parties would be time well spent during the early planning cycle. Most NGOs will not have any knowledge or experience dealing with the way the Air Force does business or how MOOTW operations are conducted. Resolving questions and conflicts early in the planning process, educating the

participants and clarifying legal requirements are critical to ensuring a successful and smooth-running contingency operation.

Local and Refugee Workers.

Local Workers. Work habits and rest days vary in every part of the world. Many work habits have been developed from religious influences. Prayer times, religious holidays and government regulations are major factors. Planners and schedulers should be aware of local customs and any special food requirements and react by scheduling in these factors. Since camps are usually located in remote areas, the national workers will adhere to their old ways unless the contractor can influence them, usually monetarily, to change. In most cases, even monetary incentives eventually lose effectiveness over traditions and customs.

Refugee Workers. If refugee workers are to be used, planning must consider UNHCR and host nation laws regarding wage rates and the legalities of hiring refugees. Such items as wage taxes, the destabilization of local labor markets, local inflationary pressures, and the impact of the construction effort on the local population should be considered.

Safety. The host nation will most certainly have safety rules, laws and guidelines. Equally certain is the fact that the workers will routinely fail to observe even the most basic safety rules, procedures and methods. Safety is rarely observed as stringently in third world countries as in the western industrialized nations. Workers will observe some safe work habits and individuals will watch out for each other. It is important to introduce safety in a manner that will be accepted by the local work force and put into place any national safety standards that may exist. Supervisors and managers must set the example for the work force to follow. It is

important to enforce these standards not only for the safety of the host nation personnel, but also for the personnel who are used to working under safety guidelines observed in western nations. U.S. personnel may not be alert to the potential hazards presented in less developed areas. For example, the mandatory use of backup motion alarms for heavy equipment is commonplace in western nations, but is virtually unknown in undeveloped areas. One of the major safety items is personal protective equipment. Local contractors and employees will most likely not have hardhats, safety goggles, ear protection, gloves or safety shoes. It will be necessary to provide these safety items to the work force from the beginning of the project.

Customs and Immigration. Prompt and efficient clearance of all goods through the host nation's customs system is critical to ensuring smooth flow of supplies, equipment and people to the campsites. One of the primary bottlenecks for freight is the time it spends in customs. Delays are often due to improper and incomplete documentation. Each country has specific documentary requirements that must be adhered to.

Contact Officials Early. It is important to establish contact with local customs authorities at the beginning of the project to learn country laws, forms, costs, landing fees, and hours of operation of ports of entry. Also establish contact with host nation officials and U.S. Embassy or Consulate for assistance in expediting goods. This contact should be made during the initial site survey. A local freight company may also assist in clearing goods through customs and should be contacted during the site survey. The initial survey team should gather names, phone numbers and E-mail addresses for future reference. Meet with customs officials to discuss advance clearance of relief goods and determine if waivers can be

obtained to expedite resources through customs. Also obtain information on obtaining waivers of duties and taxes for relief goods. This is often accomplished by including a “gift certificate” document in the import documentation package. This document states that the goods are a donation to either the host nation or an NGO and are not for resale.

Import Regulations. Care must be taken to ensure that all materials can be legally imported into the host nation or the waivers or exemptions from regulations can be obtained. This is especially important in the case of drugs, chemicals and certain types of foods.

Documentation. Establish uniform documentary procedures for all materials coming into the host nation. Consistent uniform documents such as invoices, packing lists, gift certificates, certificates of origin and other required documentation make project materials recognizable to customs officers and will often lessen the time goods spend in the customs clearance process. Investigate whether customs service hours can be extended and whether weekend hours are available or can be arranged in the case of urgent or emergency shipments. All gathered information should be consolidated and provided to the planning cell for future reference.

Holidays. Check host nation holidays and their impact on operations.

Applicability of USAID Field Operating Guide Handbook and UNHCR Handbook for Emergencies. The United States Agency for International Development and the United Nations High Commissioner for Refugees each have a handbook designed to provide guidance to

any government or NGO involved with refugees. In addition, most NGOs such as the Cooperative for Assistance and Relief Everywhere (CARE) or Medical Emergency Relief International (MERLIN) have documents that identify some degree of standard for refugee care. The level of detail in each of these operating guides varies greatly and, in most cases, leaves room for individual interpretation that requires coordination and resolution.

The UNHCR Handbook for Emergencies. The UNHCR Handbook for Emergencies tends to be more general in nature and leaves the details of refugee camp construction and operation to the NGOs involved in the management of refugee care. Chapter 5 contains very specific guidance on warehouse space, labeling of containers, and quality of tent material, blankets and cooking utensils. Chapter 8 also provides specific guidance on daily food rations.

The USAID Field Operations Guide. The USAID Field Operations Guide is written in a checklist style format, and is designed to be a reference tool for individuals sent to disaster sites to perform disaster assessments. It provides general responsibilities for disaster responders along with reporting formats and reference guides. Although it addresses displaced persons (refugees), it is not written with the purpose of providing a specific set of standards for refugee camp design and construction. Like the UNHCR Handbook, it provides general guidance and allows for individual interpretation. In addition, its data is based primarily on Africa. As a result, the design standards in the manual are subject to question outside the African continent and must be modified to meet the particular refugee situation on hand. For example, daily potable water requirements will differ based upon geography, culture, and weather.

Although the two manuals are in general conceptual agreement, there are enough differences to generate debate over which standard needs to be applied. This is especially true in the areas of community size, water and sanitation. Each manual leaves room for personal judgment, which will be interpreted differently by each individual organization. These different interpretations coupled with the specific organizational goals of each NGO involved, must be resolved quickly and prior to construction start. The final objective must be to establish a single set of design standards.

Table 1. Comparison of UNHCR and USAID Standards.

Item	UNHCR Handbook for Emergencies	USAID Field Operations Guide
Minimum Living Space	3.5 square meters per person (4.16 square yards or 37 square feet per person)	Minimum living space of 3.5 square meters per person A refugee camp should be organized into small communities (villages) of approximately 1,000 people
Latrines	One latrine for every 20 people Latrines will be at least 6 meters from any living shelter There will be a latrine within 50 meters of every shelter The UNHCR Handbook	One latrine for every 20 people There will be a latrine within 100 meters of every shelter There will be a latrine within 50 meters of

Item	UNHCR Handbook for Emergencies	USAID Field Operations Guide
	<p>provides several designs for latrines in Chapter 10. It then goes on to say that there are many potentially satisfactory types of latrines. Key factors of consideration in latrine selection are low cost, simplicity and ease of maintenance.</p>	<p>every living shelter</p> <p>Latrines will be at least 6 meters from any living shelter</p> <p>The USAID Field Operating Guide discusses the importance of sanitation, but does not provide actual designs</p>
Water	<p>The maximum distance between any shelter and a water point will be 100 meters</p> <p>Minimum individual water demands of 15-20 liters (4 – 5 gallons) per day per person</p> <p>Minimum health center water demands of 40-60 liters (10 – 16 gallons) per patient per day</p> <p>Minimum feeding center water demands of 20-30 liters (5 – 8 gallons) per person per day</p>	<p>There will be a water tap for every 200-250 people</p> <p>Minimum individual water demands of 15-20 liters per day per person</p> <p>Minimum health center water demands of 20-30 liters per patient per day</p> <p>Minimum feeding center water demands: 40-60 liters per person per day</p>

Item	UNHCR Handbook for Emergencies	USAID Field Operations Guide
Fire Breaks or Stops	A 50-meter fire break (area with no buildings) is recommended every 300 meters	A 50-meter fire break (area with no buildings) is recommended every 300 meters
Shelter	A multi-family shelter will billet no more than 35 people Recommends that shelters can and almost always should be constructed by the refugees themselves.	Recommends the minimum technical specifications for the area's seasons

Transition Planning. Planning for construction of a refugee camp should also include planning for turning it over to the organizations that will be running it after completion. Included should be such issues as when transition will occur, the process by which turnover will happen, agreements concerning maintenance of facilities if turnover is incremental, and contingency plans. Planning must also consider legal requirements for transfer of U.S. Government property and property inventory requirements prior to turnover.

Scheduling. Accurate planning of the material and equipment needed, the time required for procurement and transportation and the requirements of the construction effort in terms of site preparation and the magnitude of the construction effort must be considered in the scheduling process. Early definition of facility construction requirements and agreement by the parties involved will contribute to accurate construction scheduling. An automated tool such as Microsoft

Project™ will provide scheduling and tracking capability and provide for electronic transfer of schedule information.

Other Factors. Negotiating with local governments for various concessions such as water and power supplies; managing ancillary projects to repair roads or other infrastructure damaged by the construction effort or merely in need of repair to make them useable; planning and executing improvement projects to ease feelings due to refugee camp intrusion on the local populace are all issues that may arise during camp construction and must be factored into all planning and staffing requirements.

Transportation. Reliance on local transportation resources and contractors may prove to be frustrating and require extensive planning and coordination. Transportation infrastructure such as roads and bridges may be substandard for heavily loaded trucks and construction equipment. Alternate routes may not be available.

Communications. Understanding local communications capability limitations is paramount to ensuring adequate communications planning. Lack of commercial telephone lines, poor satellite coverage and the coordination of hand-held radio frequencies may all present challenges.

Documentation. Include a plan for collecting and recording information concerning the refugee camp project from start to finish. Consider such things as keeping a running log of significant events and lessons learned. Also include provisions for filing, storing and protecting key documents.

SITE REQUIREMENTS



Figure 8. Camp Hope Site. Site selection will almost always involve compromise – but it is critical to successful contingency operations.

Survey Team Composition. Effective support of a refugee camp construction mission is dependent on putting the right people on the ground early in the operation. A successful project requires planning, engineering design, scheduling, procurement of materials, construction implementation and client acceptance. As a result, the survey team must have complete representation from all aspects of the refugee camp

construction and operation. It is important to send services and support people as well as engineers and construction managers to the prospective site. On the site survey, each team member will be able to look at those things important to their portion of the mission. If only engineers and construction managers attend the site survey, they may not adequately address other support, logistic, communication, and maintenance requirements. The members of the site survey team must be adjusted to the situation, but should generally include the following:

- ➔ Military Camp Commander
- ➔ Engineering Team
 - Civil Engineer
 - Mechanical Engineer
 - Electrical Engineer
 - Water/Wastewater Engineer
 - Land Surveyors
 - Environmental Engineer
 - Computer Aided Drawing and Design (CADD) Operators
 - Hydrologist
- ➔ Construction Team
 - Construction Superintendent
 - Contracting Officers
 - Scheduler
 - Safety
- ➔ Non-Government Organization representatives from involved agencies
- ➔ Support staff representatives
 - Security
 - Transportation
 - Logistics
 - Legal
 - Medical
 - Services & Life Support

Communications

Civil Affairs

Description of Key Site Survey Team Members.

Military Camp Commander. The camp commander is the senior military representative with primary responsibility for security. This individual works directly with the civil engineer/engineering manager or designated site survey team leader to coordinate and integrate security into the camp design and layout. The military camp commander will be responsible for reporting status to higher military command authorities, command posts and planning cells.

Civil Engineer. The civil engineer will serve as the engineering manager and be responsible for the coordination of the engineering team. All engineering matters of planning, studies, surveying, design, and construction will be under this individual's direct control to provide the engineering support to the overall mission. The civil engineer/engineering manager will be the direct interface with the overall site project manager. This person should have experience in rapid and mobile facility or emergency facility design layout and construction.

Mechanical Engineer. The mechanical engineer should be a part of the team if there is a potential to design pumping systems and other mechanical systems related to fuel depot supplies, fuel storage facilities, mechanical piping, heating units and elements. The mechanical engineer will also assist the water/wastewater engineer in design of water/wastewater pumps, valves and filters.

Electrical Engineer. The role of the electrical engineer will be design and oversight of all electrical power lines, power supplies, lighting and generator power.

Surveyors. At a minimum, a topographic land survey must be completed with a basic layout of the site before a construction schedule can be completed. The purpose of this requirement is to define possible topographic and hydrographic features that would present problems during construction and placement of facilities.

Water/Wastewater Engineer. Sources of water are critical in site selection. The water/wastewater engineer is key in the location of water supply sources for a camp. Samples of water supplies must be collected, laboratory tested and expedited to determine the design parameters for water treatment facilities. If a major stream is not available, then ground water will have to be located by drilling and testing for the potable water supply. The water/wastewater engineer needs to become a part of the drilling team element. This individual will evaluate drilling logs, obtain water samples for laboratory evaluation, and will evaluate the well logs to determine if the well or well field can supply the required demand for the camp. Disposal of wastewater is also critical for the health of the individuals housed in the camps. The water/wastewater engineer must identify a system to dispose of wastewater from latrines, shower facilities, laundry, and kitchens. Potential contract disposal companies should be identified. If applicable, stormwater flow from the camp should also be evaluated.

Environmental Engineer. An environmental assessment must be completed prior to construction, so that an environmental baseline can be established. The site assessment information the environmental engineer collects will be needed for the environmental baseline assessment. In addition, the environmental engineer will also be able to assess any immediate environmental hazards.

Computer-Aided Drafting and Design (CADD) Operators.

These personnel should be part of the initial team to provide the design layouts, final plans and specifications for the construction effort. Their presence with CADD equipment and plotters at the forward elements provide quickly-available drawings for the mission.

Hydrologist. When drilling of wells for a potable water supply is required, the site survey team should include a hydrologist. This individual will assist the water/wastewater engineer in identification of suitable locations for wells and well design requirements. Additionally, this individual will work with the construction superintendent to identify the local labor and equipment available for well drilling.

Construction Superintendent. The construction superintendent manages all construction activities. This individual leads the construction team and identifies critical events in material acquisition, project scheduling and construction as it relates to the specific site. The construction superintendent initiates the identification and contracting of local labor.

Contracting Officers. The contracting officers identify and begin the process to source materials, equipment and related appurtenances for the construction project.

Project Scheduler. The project scheduler develops the construction time line as it pertains to the specific site. It reflects material delivery times, construction time, manpower requirements, equipment requirements and their expected variation on a daily basis.

Safety. The safety representative identifies hazards and risks to the site survey team and the general population. This individual oversees the adherence to safe practices and standards and reports directly to the civil engineer/engineering manager or designated site survey team leader.

Non-Government Organizations. The NGO representatives that will be responsible for operating the completed camp need to become involved in the initial camp design. Ideally, a single organization will have been identified prior to the site survey. The senior representative from that organization should attend the site survey and provide guidance to other NGO organizations.

Military Support Staff. Military representatives designated by the senior military commander required to support military operations at and around the camp.

Security. The security representative is responsible to the camp commander for addressing any security issues identified with the potential site location, avenues of approach and evacuation, and local military and civilian threats. The security representative should work directly with the civil engineer, engineering manager, or site survey team leader to coordinate and integrate security into the camp design and layout.

Transportation. The transportation representative begins coordination for the transport of equipment, tools and supplies. This individual obtains transportation systems maps and works with the communications representative for communications between transportation assets.

Logistics. The logistics representative identifies sources of supply and materials in the local area and assists the transportation planner with customs issues.

Medical. The medical technician evaluates the probability and types of disease and the availability of local medical facilities and personnel.

Legal. The legal representative assists with issues such as land use, labor laws and coordination with local law enforcement authorities.

Services and Life Support. Quality of life functions include feeding, billeting, laundry, morale, welfare and recreation (MWR) facilities, local supplies and local labor markets. This individual should work with the construction superintendent to coordinate local labor requirements.

Communications. A communication engineer or technician will be needed on the initial site survey team to identify obstacles that would prevent reliable communications for the voice, data, radio, satellites, and line of site (LOS) radio networks. They will also be needed to help in the camp layout, to ensure a proper and reliable local area network (LAN) within the camp, if required.

CA/CMOC. Civil affairs coordination should begin as soon as a site is under consideration. Knowledge of local conditions and concerns allows planning to be more complete and eases potential disruption and resentment.

Minimum Site Visit Requirements. Time and economics may not allow all team members to visit each site requiring analysis and evaluation. At a minimum, the lead members from each of the

functional areas should visit each site and conduct internal meetings with their team members to assess options.

Basic Siting Requirements and Considerations. The location of a displaced person camp may range from a spontaneous settlement over a wide area, to an organized rural settlement, to a concentration in a very limited area. A solution that maintains and fosters self-reliance among the displaced is always preferable.

Design Criteria for Population. A key consideration for all refugee camps is the length of time the camp is expected to be occupied. This impacts the type of design and level of construction efforts. If no prospects are in sight for a resolution to the displacement, planning for the refugee population's needs should assume a long-term outlook. This includes planning for all seasons (winter and summer) as well as for rain and drought. Determination of the weather extremes must be a primary design factor. Temporary arrangements can be very difficult and costly to change once established. Site selection, planning, and the types of shelter available all have a direct bearing on the level of assistance.

Standards. Numerous guidelines and standards are available from NGO handbooks on individual personal space requirements. These desired standards are important considerations in the overall assessment of needs and the planning of emergency response. However, other factors such as availability of land, site topography, accessibility, environmental hazards, soil conditions, land rights, potable and non-potable water, and cultural demands may have an overriding effect. Decisions on camp design must be made as part of an integrated approach, taking into account advice from experts and the views of displaced refugee population. Additional expertise may be required in the fields of geology, settlement planning, and public health. Familiarity with local

conditions in both the refugee populations' area of origin, and their present location of displacement are also important. There may be a need to set up a reception or transit center through which the refugees pass on their way to a longer-term settlement site. These centers must have the same considerations as those relevant to the long-term settlements.

Specific Areas for Design Consideration. A detailed Site Survey Checklist is at Annex E.

Land Availability. Good land for farming or building is most likely already used by the local population and not available as a campsite. Many potential refugee sites will be on local government land donated for the camp. Transfer of the land to the U.S. Government for camp construction may take place through a formal agreement or informally through something as simple as a handshake. Since this land is generally free, the site will probably be poor and construction on the site will probably be difficult. Keep in mind such things as drainage, elevation, and soil type when designing standards--these will impact the design parameters. The past use of the site is also important. The poor regulation of nuclear materials and toxic chemicals in many countries of the world may have polluted an identified site to the point of unhealthy use.

Water. The single most important site-selection criterion is the availability of an adequate amount of potable or treatable water on a year-round basis. It is also commonly the most problematic. A site should not be selected on the assumption that water can be obtained through drilling, digging, or hauling. For example, wells were very difficult to drill at the Camp Hope site in Albania, which resulted in a series of failed attempts to obtain water from wells. The issue of water must be solved through sound engineering

practices before finally selecting the site. The design criteria for water consumption will vary greatly among NGO organizations. In general, it should be expected that the refugees will use more water than any minimum value in any operations guide or handbook. Also, a planning factor must be included for the non-refugee population conducting the disbursement of food and supplies. No site should be selected where the hauling of water will be required over a long period. Professional assessment of water availability is an essential prerequisite in selecting a site. Water demand for fire fighting must be included. Either use potable water or collect brine or gray water runoff for fire fighting purposes.

Drainage and Site Topography. Where water is readily available, drainage often becomes the key criterion. Site topography is therefore one of the key factors for construction. It impacts the construction time and cost. For effective drainage, the entire site should be located above flood level at a minimum of 3 meters above the water table, preferably on a gently sloping area. Flat sites can present serious problems for the drainage of waste and storm water and should be avoided. Minimum drainage slopes must be maintained. Marshes or areas likely to become marshy or soggy during the rainy season should be avoided. The watershed of the area must be reviewed and analyzed.

Open Space. The site must provide sufficient usable space for the displaced population. The UNHCR recommends a minimum of 3.5 square meters per person, plus the necessary land for communal and agricultural activities and livestock. Since there is always the possibility that more people may arrive, the site should be large enough to allow for expansion. If the population has been displaced because of civil strife, the site should be removed from areas of potential conflict.

Accessibility. The site must be accessible by vehicles and close to communication links and sources of supplies and services such as food, cooking fuel and shelter material.

Environmental Considerations. The area should be free of major environmental health hazards such as malaria, onchocerciasis (river blindness), schistosomiasis (bilharzia), or tsetse fly, or other vectors. Pollution must also be considered. Refugee camps usually have a high percentage of small children. Many residents may only have minimal clothing and may not have shoes. They will probably be in constant contact with the soil and any pollution that is present in the soil. A detailed land history is important to determine potential environmental and health risks.

Climatic conditions. The site should be suitable for habitation throughout the year. For instance, a suitable site in the dry season may be unusable during the rainy season. While a daily breeze is an advantage, strong winds may damage emergency and temporary housing, especially tents. To the extent possible, displaced people should not be settled in an area where the climate differs greatly from that to which they are accustomed.

Soil and Ground Cover. The soil should allow for water absorption and the retention of human waste. Rocky or impermeable sites should be avoided. If possible, land suitable for vegetable gardens and small-scale agriculture should be selected for the site. If possible, the site should have a good groundcover of grass, or bushes, or trees, as covering vegetation provides shade and reduces erosion and dust. During construction of the camp, care should be taken to cause as little damage as possible to the vegetation and topsoil. Bulldozers, if used, should avoid scrapping topsoil off the site, as often occurs. If wood must be used for domestic cooking fuel, it should not be taken from vegetation on

the site. Alternative sources of fuel must be found as soon as possible to avoid irreplaceable loss of surrounding wood.

Land Rights. The land should be exempt from ownership, grazing, and other uses by local populations. This can be a major cause of local resentment. Some authorities proposing the site are unaware of customary rights exercised by local populations. Sites are often provided on public land by the government. Any use of the land must be based on formal legal arrangements in accordance with the laws of the country.

Cost. Land should be leased only if there is no other way to obtain needed space for the proposed camp. The cost of necessary site preparation and drainage work should also be considered.

Design Approval. The final approval of the refugee camp layout and its infrastructure may not come from a single person or organization. In rapidly developing situations such as refugee camps, approval could come from the U.S. Military, the United Nations and NGOs. **All potential approving organizations must be brought into the design process at the start.** Each will have special requirements that must be incorporated into the final design. Once the initial conceptual design is complete, a meeting should be scheduled with key decision-makers from each organization. The lead design engineer should brief in conjunction with the site manager. The construction site manager must also be present. This briefing will allow everyone to listen to all discussion and saves time in coordinating any changes. Most people in the meeting will have little knowledge in engineering or construction. They will know they want something, but often times cannot describe what they want. Presenting a simple common sense plan will help them express their needs. A well thought out plan will probably be accepted with minor adjustments. Simply asking for requirements from United Nations or NGOs will not obtain a lot of important information. The

designer needs to make assumptions, and use good engineering common sense in putting together the plan.

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PLANNING FOUNDATION



Figure 9. Kids at Water Tap. Facilities that allow refugees to continue their lives as normally as possible will help reduce social tensions and provide a level of comfort and safety that is reassuring.

Living Areas. These are the most visible part of a refugee camp and the most important to the refugee population. Planning the layout and construction of living areas requires a substantial amount of information about the site, culture and demographics of the population, availability of materials, and available labor force. Camp construction standards must fit the potential population. The USAID *Field Operations Guide* contains a wealth of information about construction, primarily for displaced African populations.

Physical Layout. The basic principle of any physical layout of a camp is that it should be organized into small community units or villages with no more than about 1000 people per community. These communities are then tied together into sectors. A sector will generally have 10 to 20 communities and contain decentralized community services. These community services include electrical power generation, water storage, schools and medical clinics. Individual communities are organized around and dependent upon these central core services.

Centralized Services. The location of centralized services will depend on the specific situation and in particular the space available. Where space is available, it may be advantageous to have the centralized services located in the center of the camp. Where space is scarce, it may be better if centralized services are located near the entrance to the site. This will avoid trucks having to drive through a densely populated camp. Whatever the layout, warehouses should be located near the administrative office for security reasons.

Layout. A linear or grid layout, with square or rectangular areas separated by parallel streets is a frequently used layout. It has a simple design, is quick to implement, and allows a high population density. This design does however have disadvantages, primarily because its space efficiency leads to close living conditions. Environmental health problems and disease are directly proportional to population density. Furthermore, a rigid grid design makes the creation of community identity difficult. Most refugees or displaced people are not usually accustomed to living in such a pattern. Cultural, regional and religious preferences, as well as differences in potential populations could very well drive the camp layout. Planners can anticipate assistance from NGOs and the UNHCR in designing and building to satisfy requirements

of the population. The lead engineer must be prepared to do preliminary planning, and obtain early decisions in order to start material flow to the site. Planning, design and material availability all drive the construction schedule.

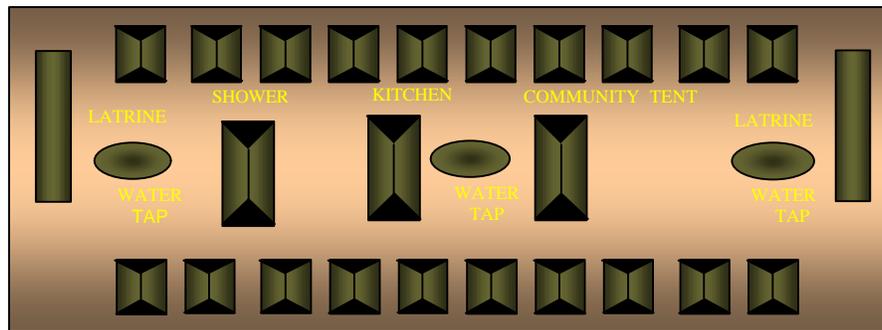


Figure 10. Community Layout. Typical 200-person community layout using GP-medium tents.

Shelter. At a minimum, shelter must provide protection from the elements, space in which to live and store belongings, privacy, and emotional security. Shelter is one of the most important determinants of general living conditions and is often one of the

largest items of nonrecurring expenditure. Although the basic need for shelter is similar in most emergencies, other considerations such as the kind of housing needed, what materials and design are used, who constructs the housing, and how long it must last will differ significantly in each situation.

Shelter Options. Neither prefabricated buildings, tents nor specially developed emergency shelter units provide a single best option for all housing needs during refugee emergencies. Each is ineffective because of time, high unit cost, transport problems, and inflexibility. Generally emergency shelter arrangements will have already been constructed before such systems can arrive. Tents are difficult to live in and provide little insulation from temperature extremes. Tents, however, may be useful for refugees of nomadic origin, and when local materials are not available or are only seasonally available. If tents are used, repair materials should also be provided.

Cultural Requirements. Housing should meet the cultural and social requirements of the refugee's home. Similar housing will help reduce the disorientation and emotional stress suffered by the displaced population. To the greatest extent possible, long-term housing needs to be similar in design and construction to what the refugee is familiar to living inside. This is important, but it must also be weighed with existing local conditions and practice and time constraints. This will generally mean single-family shelters, unless the displaced are accustomed to multi-family units. Although more costly, the benefits of individual homes for refugees cannot be overestimated. The risk of communicable diseases increases enormously in communal shelters. If multi-family shelters must be used, no more than 35 persons (approximately 7 families) should be assigned to any one

structure. Experience has shown that social and environmental problems may also rise if more people live in multi-family shelters. In addition, buildings made from local materials may be approaching their structural limits at this size.

Central Community Areas. At the onset of an emergency, it may be difficult to foresee all the administrative and community services likely to be required. Underestimation of the space required for future communal needs is a common problem in camps of limited area. Therefore, where adequate space is available, free areas must be allocated for future expansion of these services. The following lists administrative and community services that are often required:

Likely to be centralized:

- Camp administrative office.
- Essential services coordination offices (health care, feeding programs, water supply, education).
- Warehousing and storage.
- Initial registration/health screening area.
- Tracing service used to locate individual refugees.
- Therapeutic feeding center if required.
- Religious centers.
- Medical facilities.

Likely to be decentralized:

- Bathing and washing areas.
- Schools.
- Community services (health centers, social service centers).
- Supplementary feeding centers (if required).
- Institutional centers for disabled people or unaccompanied children, if required.

Medical Area. In emergencies involving refugees, the possible expansion of existing local medical facilities should be investigated. The rapid increase in population will generate an increased patient load. An on-site emergency facility will be required, as well as a preventive medicine facility. Use of local existing facilities will help ease the burden of these on-site health clinics especially for a short-term camp.

Space Requirement. As a general rule, a minimum of 80 square meters of hospital space is required for every 4,000 people. If tents are used, a standard GP-Large (18' by 52') tent can accommodate 10 beds or 40 patients without beds. When the weather permits, the tent window flaps, if they exist, should be rolled up and the mosquito nets covering the opening. Tents should be an interim measure as refugee camp medical facilities. The long-term health shelters need to be decided upon between the health staff, the design engineer and the construction team.

Utilities. Two utility categories are required in virtually all refugee camps. These are electrical supply and distribution, and water supply and distribution. Although sanitation is essential, it is doubtful that time and funds will permit the installation of a sanitary sewer system. Sanitation will therefore be addressed separately and not as a utility system. A central heating system for the camp is also unlikely and will also be addressed separately.

Electrical Supply and Distribution. If local commercial electrical power is available, a centralized camp electrical supply source is desirable, but not essential. Diesel engine driven electrical generators can be used and positioned as necessary around the camp. Priority for electrical power should go to security lighting, access lighting and operating water pumps around the camp. If time and funds permit, electrical power can then be provided to individual living shelters.

Water Supply and Distribution. Potable water is required for drinking and cooking and preferred for all camp operations. If the supply of potable water is not sufficient for all requirements, non-potable water can be used for non-food service cleaning and bathing. A continuous and reliable source of water is essential for the camp. Within the camp, it is most desirable to have a gravity-fed water distribution system. The system must be able to provide an absolute minimum of 20 liters of water per day per person to the refugee population. If available, the use of local public water is highly desirable. Such water must be analyzed and, if necessary, treated to an acceptable health standard. Water from a public source should need only chlorinating to maintain chlorine residual in the storage tank and distribution piping. Water treatment facilities should, when possible, be located at the campsite. If a source of water is within reasonable distance, a temporary pipeline can be constructed. The water can also be trucked from the source to the camp until the pipeline is in place. Water demand for fire fighting must also be included. For this purpose, either use potable water or collect brine or gray water runoff.

Water Sources. If there is no public water source available, an area within a ten-mile radius of the camp should be canvassed for other potential sources of raw water suitable to produce potable water. A map of the area showing watercourses such as rivers, streams, lakes, springs, and irrigation canals should be obtained. This map should also indicate public roads that can be used to install water pipelines to transmit the water from the raw water source to the camp. Factors which should be examined to select the desirable water source are distance from the camp, quality of the raw water, topographical elevation differences between the source and the camp site, easement requirements, power

requirements, and security of the pipeline. The raw water should be as free of pollutants as possible since invariably the raw water will require treatment to render it potable. The more pollutants in the raw water the greater the degree of treatment required. The potential raw water source should be tested for physical, chemical and bacteriological properties, especially turbidity, total dissolved solids, conductivity, pH, and coliforms.

Groundwater. Groundwater can be used as an additional source of water for the camp. An advantage of using groundwater from a deep-well drilled on site is security. A well within the confines of the campsite is less likely to be tampered with and contaminated than a source of water outside the camp. Also, groundwater is usually of good quality, which usually means that only disinfecting is required to treat the water to ensure potability. Groundwater should be analyzed for chemical properties. It can be saline, especially if it is located close to the seashore. Also, it may have a high mineral content such as excessive hardness, iron, or hydrogen sulfide which imparts a rotten egg odor and taste. These are all conditions that will probably require treatment for removal of pollutants. To quickly screen for these conditions, the area around the campsite should be canvassed to locate any producing wells, publicly or individually owned. Querying the owners of adjacent wells about the size of the well, the depth, the volumetric production, and the quality of the water from each well could indicate whether groundwater is a likely candidate for a water supply. Other sources of information about the groundwater formation below the camp-site are local institutions such as universities or hydraulic institutes. If groundwater appears to be a potential source of water, then a local well drilling company should be contacted to drill test

wells on site. Information obtained from the test well will determine whether a fully developed deep well is feasible.

Conveying Water to the Site. Once a raw water source is selected and land rights are secured, the means of conveying the water to the site must be provided. Most likely the water will have to be pumped through a pipeline to the campsite. The pump station site must be secured and protected for the duration of the camp operation. If the area is remote, permanent access must be established, and a power generator and fuel must be brought in to operate the pumping equipment. Hydraulic considerations will dictate the diameter of the transmission pipe. Selection of the appropriate piping material must be made based on local conditions and availability. Smooth walled pipe is generally a good selection since it will reduce the pipe friction factor and minimize power costs. Using plastic pipe with long run sections will minimize piping joints and will save installation labor and procurement costs.

Water Treatment. Once the raw water is conveyed to the site, the raw water must be treated to remove any pollutants that render the water not potable. The water must be treated to meet the quality standards for potable water of the host nation or the World Health Organization. Conventional treatment for raw surface water is coagulation, flocculation, filtration, and disinfection.

The need for water treatment and equipment required for the process must be considered. Important factors are the local availability of equipment, time of delivery, chemicals and reliable supplier for the chosen process requirements. Typical chemicals required are aluminum sulfate, polymer, lime, and

calcium or sodium hypochlorite. Also the duration of the camp operation should be considered in selecting the appropriate and most economic process. For an expected short-duration camp, water processing equipment that is portable and easily set up would be preferable to permanently installed equipment that requires extensive foundation and structural work.

Water Storage. Treated water should be pumped to portable, temporary storage tanks located in the central region of the camp tents. Storage tanks should be sized to provide a minimum of four hours storage of potable water.

Water Distribution. Tanks elevated by placing them on a mound of soil or on a constructed structure can be used without requiring additional pumping. Elevating the tanks 15 to 20 feet above the normal grade elevation of the camp will usually provide sufficient hydraulic head to gravity feed the water to spigots located at the end of the service laterals. If properly sized, the distribution system should be able to supply a flow of one to three gallons of water per minute to the spigots with an adequate end-of-the line operating pressure. If a gravity fed system is not feasible an alternate dual pump system should be designed. Peak usage and instantaneous demands are very high in camps due to the centralized schedules for food distribution. Additionally, limited lighting requires bathing and washing during daylight hours.

Latrines. Latrines are an integral factor of site health and disease control. There should be at least one latrine for every 20 persons. They should be located no less than 6 meters, and no further than 50 meters, from any shelter. If latrines are too far away, they will not be used.

Sufficient space must also be left for replacement latrines. This space requirement will affect camp layout and land use. If communal latrines are unavoidable, they should be accessible by road to facilitate maintenance. To avoid contaminating water sources, latrines should have an effective drainage system that is easily repaired, both for rainwater and wastewater. The design of the latrine is a very important item for cultural reasons and may determine whether they are used. Eastern-style latrines are used squatting and western-style latrines are used sitting. The proper type(s) to be used must be determined during initial planning. The availability of water and sewage facilities will probably determine whether flush toilets or dry toilets requiring pumping will be used. All latrines, sewage collection systems, and pumping stations should be designed to prevent rainwater flooding. Normally, pumps are mounted on medium to heavy load type vehicles with large turning radii and access roads should be designed for these trucks.

Environmental Baseline Study. An environmental baseline study should be completed prior to the start of construction. The purpose of the study is to determine the current environmental situation at each potential refugee campsite. This study should be designed to be quickly, but accurately, completed. It includes such critical information as current and historical land use, level of existing pollution, existing wildlife, general soil conditions and the effects of site drainage. This baseline assessment will first be used to determine if construction of a refugee site is environmentally feasible. Second, it is used as a historical record of the pre-refugee campsite conditions, if at a later date, the site is to be returned to its original condition. A qualified environmental engineer is best trained to complete this task.

Environmental Health. The goal of a refugee camp is to provide a safe and healthy temporary residence, until the displaced people can return to their former home or be settled in a new location. The

refugees will probably be unaccustomed to the living conditions in the camp. Environmental health problems can quickly arise. A proper environmental baseline study will account for the effects the potential site will have on disease and illness.

The most common environmental related diseases :

- Fecal (oral diseases) including diarrhea.
- Soil transmitted disease such as roundworm usually resulting where soil is contaminated with human excreta.
- Water-based disease such as schistosomiasis where the disease vector is present in water contaminated by human waste.
- Shelter related diseases such as pneumonia where people become more susceptible to infection due to being cold and wet.
- Vector-based disease caused by animals such as insects and rodents.

Environmental measures required to control infectious disease are:

- Provision of an adequate quantity of water.
- Provision and consumption of water that is of an acceptable quality.
- The safe containment and disposal of excreta.
- Provision of adequate shelter.
- Vector control.

Waste Management. The categories of waste produced at a camp and their means of disposal and management are:

Gray Water. Domestic gray water from bathing and clothes washing. Gray water can be collected in buried perforated or slotted drain lines used for draining storm water. These drain lines will transport the gray water away from the refugee shelters to a storm drainage ditch.

Garbage and Trash. Garbage and trash includes principally food scraps, food packing, and paper wastes. These wastes should be collected daily from receptacles and removed from the premises to a sanitary landfill. The landfill may be constructed on the campsite, or a nearby commercial landfill can be used.

Toilet “Concentrated” Waste. Refugees should use the toilets and latrines provided in the camp. The waste should be collected each day and the latrines sanitized. A service contract with a service provider can generally be negotiated for a fee. The point of disposal of the wastes should be a consideration during the environmental assessment. Disposal of liquid waste from wastewater treatment, such as sludge and treatment reject streams, must be decided on a case-by-case basis. Traditional practices and beliefs concerning the disposal of human feces can crucially affect the acceptability and impact of excreta disposal methods. In the case of emergency refugee camps, time is the critical factor.

Adequate Surface Drainage. Where the ground slope allows, the simplest method is to divert sludge to flowing rivers and streams downstream of water sources. Do not dispose of sludge with a high organic content into stagnant river pools or dry streambeds; it may become anaerobic and produce offensive odors and also encourage flies, rats, etc. A minimum gradient of 1 in 200 is recommended for drainage channels or long pipes.

Refuse Disposal. Refuse can pose serious health problems if not properly controlled. Refuse encourages fly breeding and attracts rats and other animals.

Insect and Rodent Control. Insects and rodents can be a nuisance, spoil or destroy food, and transmit disease. The major disease carriers are mosquitoes, flies, fleas, and cockroaches.

Effective hygiene promotion, which is integrated with a sanitation process, is needed. Good housekeeping practices must be maintained by the construction organizations and housekeeping standard established and enforced by the NGOs managing the camp. Control of these carriers can be accomplished using insecticides, but a thorough knowledge of the safe methods of using the chemicals is essential.

Camp Security. Providing security and protecting U.S. Forces personnel, assets, base camp construction materials, and equipment are different in concept from the security required for the occupied refugee camp. The normal concept for the initial construction security elements includes armed guards, security fencing, controlled access gates, and badging of all personnel. The concept is necessary to control construction material inventories and personal protection of all workers. During construction of the camp, emphasize security in the following concerns:

- Access control.
- Perimeter fencing.
- Construction areas and Base Camp facilities.
- Traffic control points.
- Personnel entry locations.
- Base construction camp.
- Construction operations and warehousing laydown area.
- Refugee camp including the NGO administration and staff occupancy areas. The NGO administration area contains operations, warehousing, and processing areas. NGOs usually have a different approach to site security. For example, the NGOs' use of local or refugee labor with reliance upon the honor system for access control can create security control problems for construction activities. If partial occupancy is allowed before camp completion, the problems of site security and safety are compounded. Planning should recognize and

plan for phased completion to include security isolation for construction areas.

Fire Fighting. Planning for fire fighting should identify all local available resources, and any government equipment available. It is imperative to identify a fire chief at the beginning and develop a voluntary fire fighting team. Coordinate fire protection requirements with the NGOs in the planning stage. Initial planning should include firebreaks in camp design and a fire alarm system. It may be necessary to include suitable fire fighting equipment for the refugees. This equipment should also be identified in the planning stage.

Fire Prevention. Planning and engineering of camp design must consider the possibility of fire. Proper camp design will provide sufficient distance between tents or structures to minimize the spread of fire. Camp design should also take into account the location of particular fire hazards, such as propane or natural gas storage areas and bulk liquid fuels. The most likely fire hazard will be from common combustibles such as canvas, wood, and similar class "A" fire hazards. Class "B" hazards may be present around diesel or gasoline fueled generators and pumps. Some NGO cooking schemes rely on bottled gas and present a unique and difficult hazard in the field. Camp layout and facility spacing must consider fire-fighting vehicles. Minimum spacing for shelters may be specified during coordination with the NGOs. If separation distances are not specified by relief agencies during planning, use the AFPAM 10-219, Volume 5 distances of 12 feet between billets, 30 feet between rows of billets and 60 feet between groups of rows.

Fire Alarms. The simplest alarm system should suffice to alert camp occupants and designated responders to a fire emergency. Bells, gongs or whistles that are manually operated and located

appropriately throughout the camp can also be fabricated in the field. NGOs normally will arrange camp occupants into villages with a designated leader. Part of the community responsibilities will include fire fighting response under the leadership and direction of the designated leaders.

Fire Suppression. The principal reason for fire protection is to protect human life; therefore, if resources are limited, concentration should be placed on the occupied areas vice equipment locations. Some type of fire fighting capability will be needed within the refugee camp and in many cases no satisfactory indigenous capability will be available. The simplest solution involves the use of the sheer manpower present in the camp to form a bucket brigade. The requirements include a sufficient number of buckets and a stored source of water such as a river, pond or drainage ditch within a reasonable distance from the camp. A water tank, truck, or pumping system, if available, can also be sources of water for the bucket brigade.

Refugee Traffic. Movement of the refugees into and within the camp requires careful planning and coordination with the NGOs.

Reception Area. Upon arrival at the camp, refugees will be required to register. A reception area should be set up outside the camp. This area should be a large, flat open space with adequate space for a waiting area, a registration and allocation of relief item area and a post-registration dispersal area. It should include shade or weather protection shelters, potable water, and latrines. Land may be allocated for accompanying animals, vehicle parking and temporary first night shelter.

Traffic Within The Camp. Plan for and provide sufficient pedestrian walkways with cross drainage to drain water away from

shelters and service centers. Locate service centers away from dusty or potentially dangerous major access roads. Limit vehicle traffic to certain routes and establish speed limits. Construct all utility crossings to support heavy truck loading.

Roads and Pathways. The site should be accessible from other sites and contain all-weather roads and pathways connecting the various areas and facilities. Roads should be built above flood level and have adequate drainage. If there will be significant vehicle traffic on the site, it should be separated from foot traffic.

Construction Base Camp Planning. The base camp will include the support and administrative areas for the construction effort. All aspects of the base camp construction and support must be fully studied by qualified members of the Site Survey Team. Whenever possible, the base camp must be designed, materials procured and early construction integrated into the project construction schedule to ensure completion before construction of the main construction camp is started. All base camp support elements must be completed early to support the planned rapid flow of base camp occupants identified in the Initial Base Camp Loading Schedule.

Initial Base Camp Loading. All organizations participating in the planning and construction of the refugee camp must immediately identify all required personnel with the skills and experience necessary to complete the project. The travel schedules of these individuals must be coordinated and included in the Initial Base Camp Loading Schedule. All personnel selected for participation in the refugee camp construction should be cleared medically to mobilize to the site. Special medical conditions cannot usually be adequately treated at remote sites.

Mission Statement. A clear mission statement for the project should be in place before the base camp layout and planning is completed. The mission statement should clearly identify the organizations that will be living in the base camp and authorize them to receive support. All funding and political issues must be resolved before the design is finalized and approved. Expansion of the support capacity of the base camp should be included in the planning and design.

Security. Security of the base camp must be absolute. The fencing that is planned for the base camp must be more than just “nuisance fencing” and actually “security fencing”. Limited access must be designed into the layout and enforceable with minimum manpower. Sufficient safety and security lighting should be included in the design.

ID badging. A secure high quality identification (ID) card system must be procured for the construction camp. This ID system should be user friendly, computerized and allow for different areas of access and services.

Construction Base Camp Siting and Layout. The base camp must be sited in a permanent location.

Administration area. The administration area should include climate-controlled prefabricated type structures for proper housing of the electronic office equipment with adequate workspace for the operators. Non-technical offices may be housed in temporary type shelters, tents or portable buildings. Each group should identify office space requirements and these facilities should be provided to the extent possible. Offices, conference rooms, visitor and reception areas should include adequate parking areas.

Sleeping area. Sleeping facilities should be located in an area of the camp that will provide for a quiet 24-hour sleeping environment. Camp layout and facility spacing must consider fire-fighting vehicles. Latrine and shower facilities should be easily accessible prefabricated units. These units should be sited to avoid odors or excessive noise by the operation or maintenance activities. The sleeping facility must be large enough to accommodate transient visitors and allow for rapid expansion. The facility should be climate controlled for winter conditions and screened for flies and mosquitoes. Summer air conditioning is a preferred option, but it is not a necessity in most climates.

Kitchen. The kitchen should be a modular all electric unit. It should contain areas for production and serving. Additional areas for preparation, sanitation and storage must also be provided. Do not include equipment to wash and sanitize tableware. Rather, plan to serve all meals on paper and plastic products. Adequate storage for the large quantity of disposable plates and tableware should be included in the design. All paper products should be procured from sources where quality, style, and durability are already known. Availability and quality in remote regions cannot be guaranteed.



Figure 11. Dining Facility with Modular Kitchen.

Meal times. Plan meal times to support a 24-hour construction schedule. Even if 24-hour operations are only a contingency, security and other support groups will be working around the clock. Determine the regional, religious, and ethnic requirements for serving times and menu selections.

Services Planning. Include food preparation, waste disposal and sanitation of all equipment and personnel. These elements are essential to maintain food quality, safety, control, and proper sanitation. If food preparation for Air Force or other DoD personnel is contracted, military public health inspections will be required. Local food sources will require clearance from a U.S. Army veterinary service officer. All drains in the food preparation area must flow through grease traps. Proper hot water,

dishwashers with capacity for pots and pans, and three compartment sizes should be included in the design. Power generation units should be located to ensure that noise and exhaust fumes do not interfere with the kitchen operations.

Dining Facility. Design the dining facility with full size tables and chairs, since small tables and chairs will not support dining patrons with their protection and personal equipment. The dining facility must be plumbed with potable water and have adequate entrance and exit wash stations. The dining facility may be a temporary shelter, but must have a floor that can be properly cleaned and sanitized, preferably smooth concrete. The food preparation, storage access, and kitchen access areas should also have concrete floors. Adequate electric outlets should be provided for coffee, tea, juice and other serving amenities. Waste, including grease, disposal must be properly planned for and managed.

Food Storage. Provide secure food storage for cold food, frozen food and dry goods. Usually the storage requirements can be met using the shipping containers used to transport the goods to the construction site. These units should be weatherproof with adequate security while remaining readily accessible to food service personnel. It is critical to include sufficient operating space in the layout of the food service industrial area for safe unloading and placing of food storage containers. These containers will generally be some of the heaviest containers and will require heavy lift cranes and forklifts.

Latrines. Latrines should be prefabricated units with proper hand washing facilities to ensure that food handlers maintain proper sanitation practices before returning to their jobs. Latrines should be located to provide easy access to the users, but not be offensive to other service operations. Wind direction and accessibility for

maintenance are important design issues. If the latrines will require service, ensure access for the sewer service truck is maintained.



Figure 12. Base Camp Latrines with Lighting.

Showers. Showers should be prefabricated units with an adequate hot water supply and pressure to sustain the 24-hour operation. These units should be accessible to the sleeping units, but centralized for maintenance purposes. Walkways should be all weather type. Sinks and changing areas must be included in the design.

Laundry. Design a self-service laundry center as part of the base camp for use by camp occupants and visitors. The number of

washers and dryers will be determined based upon the total number of permanent and transient personnel projected for the camp. Laundry soap, bleach and other supplies should be provided. If the self-service laundry is augmented by a commercial service, a customer service center will be required. Space should be provided in the laundry center for this expansion. This center can be as simple as a tent with a receiving and dispersal area. The laundry should be easily accessible for the camp members, but not be a nuisance to the sleeping area. The laundry should be fully operational on the first day of camp occupancy, since most residents will arrive with clothes needing service.

Water Treatment and Storage. Water treatment and storage facilities will depend on the availability of local sources, but minimum treatment is usually required to meet western standards. The treatment facility should be located in the service area, since water is a 24-hour a day commodity. If bottled water is utilized for drinking, the logical issue point is in this area, with the site services manager responsible for procurement, storage and distribution. Water demand for fire fighting must be included.

Refuse Collection. Refuse collection for the base camp will probably be subcontracted to a local contractor. An all-weather collection area, usually concrete is needed with easy access by the collection truck. Odors and debris are definite problems with this operation and design should include wind factors and proper screening to control fly, rodents, and small animal access.

Primary and Emergency Power Generation. Even if available, the local power grid may not be adequate to support the added loading of a construction camp. Planning should include a primary power generation system adequate for all aspects of the base camp. Design loading factors must be identified immediately with

expansion values. Diesel power generation is the normal electrical source for camps. It is essential to provide a back up system for these units. The normal requirement is dual units of equal size and make, so repairs of any components are easy with like spares. Significant consideration must be given to reliability, maintenance and repair parts for used generators. All generators mobilized to the refugee camp must include manufacturers' manuals for the generator engine and generator unit and a complete spare parts and supplies maintenance kit for each generator. Location of the units should consider noise, fuel and maintenance accessibility.

Parking and Access Roads. Parking and access roads for the base camp are critical due to numerous daily activities. Design should include traffic flow of maintenance vehicles, visitors, dining, construction equipment, fire apparatus, and noise control. All roads and parking areas should be all-weather type with provisions for heavily loaded trucks and equipment. All parking areas and roads should be properly sloped and equipped to drain storm waters well enough to prevent flooding.

Supply Unloading Area. This area has many facets due to the numerous items that enter a base camp each day. Disposable items are in constant flow, as well as perishable food items. Delivery trucks need easy and safe access to the unloading facilities. Supply unloading areas should be all-weather surfaced with adequate surface drainage. The design team should consider adequate size for large turning radius, weight and operational requirements of cranes and forklifts used to unload delivery vehicles.

Morale, Welfare and Recreation Center. This facility is for occupants' use during off-duty hours. Even in emergency conditions, staff will require time to relax and rest. Because of shift work, the facility should be located for 24-hour accessibility.

It should include a satellite dish, color television, computer access for E-mail, and VCR with viewing area. A reading room and game room are also recommended.

Medical Facility. Determine requirements for medical facilities and equipment necessary to support the projected construction crew. Provide the capability to rapidly expand the level of medical coverage that can be provided to additional construction crews that may be required.

Construction Equipment and Materials Laydown Area. This laydown area is the hub for the construction of the main camp. It will absorb a large area, since all of the needed equipment should be on-site at the beginning of the project. The area needs to be accessible for large transport truck deliveries and demobilization at the end of the project. Maintenance and service areas are required with minimum office space for record keeping and management. Receiving areas with weatherproof documentation centers are required. The usual offices in this area are sea containers, and all small goods should also be stored in sea containers for security and weather measures. Certain materials such as paints, caulking, cements, adhesives, and electrical parts may require a climate-controlled shelter.

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LOGISTICS

Procurement and Property Control. Material and equipment should be purchased or leased as close to the affected country as possible to reduce the cost of transportation and the time needed for delivery. Items not available in country should be purchased from neighboring countries in an “expanding ring” around the affected country. Heavy construction equipment and other vehicles should be leased whenever possible.

All goods must be received with a signed receipt at time of arrival and entered into the appropriate property control system to ensure proper use and disposition of Government property. Property control must also include procedures for tracking and controlling issue of materials and tools during construction and for periodic inventory.

Transportation. Prior to movement of equipment, supplies and materials, mobilize and assign qualified logistics expeditors to every port, airport and staging area where materials will be handled. Ensure these individuals have fully coordinated with local customs and immigration officials “up front” and have a complete understanding of all documentation and fee requirements. Equip transportation personnel with all necessary means for effective communication and status reporting as required.

General Considerations. Except in the case of fast onset disasters, refugee operations generally take place in less developed countries and areas of the world. The host nation’s infrastructure and transportation capabilities may not be up to the standards of developed nations or they may have been severely damaged. Because of this, special attention must be paid to a thorough survey of the host nation’s infrastructure and transportation capabilities. It will also be critical to determine if other missions tasked within the

area of responsibility, such as military transportation operations, will compete for the resources available in the host nation or surrounding countries. Clearly understand the priorities that have been established for use and consumption of resources. Be prepared to develop and implement alternate means for supporting the refugee camp construction requirements.



Figure 13. B-747F Unloading. The B-747F requires specialized handling equipment to load and unload the main cargo deck.

Confirm equipment and supplies that have been procured, when they are required, and establish their shipping priority. The priority assigned will determine the method of transportation to be used. Time requirements and construction schedules may dictate transportation modes that are not normally used for some items such as heavy equipment and construction materials. Determine transportation resources in those countries supplying materials and equipment and coordinate movement of materials to meet the

established priorities. All goods and materials should be marked with purchase order information, inventory and lot numbers, National Stock Numbers (NSN) if applicable, final destination and any other identifying marks to facilitate in transit visibility at all times while en route.

Documentation. Communicate information provided by Customs and Immigration officials regarding details and any specific language that must be included in shipping documents that will accompany shipments. Generally, paperwork must state if goods will remain in the host nation or will be removed at the end of the emergency. Stress to all organizations that will participate in shipments that the highest level of accuracy is necessary to preclude border crossing and import delays at ports and airports.

Security. High value shipments may require special handling to include security while in storage and escorts during movements. Safety of border crossings and overland routes and theft at ports and airports may require armed escorts to ensure security during transportation. Arrangements for increased security should be coordinated with U.S. military and local police forces. In some instances, armed convoys will be needed to safely transport materials and equipment to the campsite. These requirements must be fully coordinated. Identify warehousing facilities available at all ports of entry, to include military facilities. Confirm the level of security available for each facility that will be used.

Political Considerations. Senior project and site management staff and logistics expeditors must pay attention to political situations of all countries along the route supplies, equipment, and personnel will travel in route to the construction site. Political postures held by countries involved can conflict and result in

significant delays. Less expedient methods and routes of travel may be required to avoid problem countries.



Figure 14. AN124 Unloading. Roll On/Roll Off Capability for heavy equipment.

Currency requirements. Ensure currency requirements for customs and immigration fees are fully understood for all ports of entry into the host nation. Logistics expeditors mobilized to ports of entry must have immediate availability of all funds necessary to maintain an unrestricted flow of supplies, equipment and personnel.

Airfreight Movements. Moving resources by air will most likely be necessary to meet the rapid flow of required supplies, equipment and people to the campsite. Because this mode of

transportation is costly, it is critical that all shipments have the proper customs documentation and that all required material handling equipment and trucks needed for onward movement are secured for each port of entry. Determine if any transportation support is available from military sources. Identify all airports available in the host nation and airports in neighboring countries. For each airport, determine handling capabilities, hours of operation, and scheduled commercial aircraft services available. Determine who controls and assigns landing slots at each airport considered for use as a port of entry. Identify warehousing facilities available at and near the airport in case goods must be held for any reason before shipment to site. Determine security of all storage facilities and whether goods can be held for transport at military secured areas if no secure commercial storage space can be found.



Figure 15. Port Facilities. Vessel capabilities at some ports may be limited. For example, at the port of Durrës, Albania there are no facilities for large cargo vessels.

Waterborne Movements. Waterborne movement may require the use of container ships, bulk transport vessels, Roll On/Roll Off (RO/RO) vessels and ferries to transport materials. Moving resources by water will not be as fast as air shipments, but far less expensive. Use water shipments whenever the construction schedule will allow. Government funded materials originating in the United States generally require U.S.-flagged vessels for transportation whenever possible. The United States Maritime Administration (MARAD) maintains a list of all U.S.-flagged commercial cargo vessels. Identify all ports located in the host nation as well as all ports in neighboring countries. For each port, confirm capacity, onward transport capabilities, customs and immigration information and travel time to the campsite. If

adequate cargo handling equipment is unavailable at the port, source locally first, then in nearby countries. Confirm all regularly scheduled ferries, commercial ships and barges for each port. Obtain information regarding who controls berthing assignments, unloading crews and equipment and warehouse space. Identify scheduled commercial liner services and ferry services and determine port capability to receive charter vessels. Identify warehousing facilities available at the airport and off site for temporary storage if required. Determine security of all storage facilities and whether goods can be held for transport at military secured areas if no secure commercial storage space can be found. Identify commercial container haulage, trucking companies and personnel and equipment availability.

Ground Transportation. Ground transportation includes all shipments made by truck and rail. Ground transportation movements by rail allows for moving a very high volume and wide variety of resources in a relatively short period of time. Onward ground movement by truck offers the greatest delivery flexibility. Specific needs can be prioritized for movement by truck, loaded and sent on their way to the construction site. Since this is the least secure mode of transportation, some countries may require that all foreign trucks travel in special police-escorted government convoys for safety and security. This requirement may slow transit time by as much as 24 hours during the week or more on weekends. If necessary, the U.S. military may be called upon to provide armed convoy support.



Figure 16. Road Near Fier, Albania. Road conditions may be poor and worsened by increases in heavy traffic stemming from construction and humanitarian relief vehicles.

Complete a thorough survey of road conditions for all countries involved with forward movement of resources. Pay attention to general road conditions, road construction, low bridge clearances, road damages, bridge width, bridge load bearing capacity, and security concerns for freight while in transit. Verify that border

crossings into the host nation permit goods to enter from the originating country and from all intermediate countries involved. Mobilize a senior transportation manager to work transportation and logistics issues in the operating location established by the prime contractor or the unified command responsible for the overall construction task order.

Site Transportation. Materials and workers will have to be moved within the camp during construction. If organic assets are not sufficient for the task, they can usually be rented in the local area. Using vans or buses for moving workers will make moving them from work area to work area much faster and efficient than relying on foot movement. Material handling equipment for unloading vehicles must also be considered in transportation planning.

Expediting. Identify established transportation resources and freight forwarder resources in the host nation and establish a primary point of contact (POC). If there are no established host nation resources, check with country manager of the nearest known logistics expeditor who may have agents or sub-agents in the host nation. The host nation POC should have knowledge and thorough understanding of requirements for local customs and immigration laws. The POC should have reliable communications and transportation for site surveys and addressing situations and should have reasonable command of the English language, both spoken and written. Determine requirements for transportation personnel at construction sites and at the primary contractor operating locations to act as liaison for all transportation matters. Mobilize transportation expeditors to staff every location where people, equipment, and supplies will transit while enroute to the construction site. Individuals selected must have reliable communications and transportation available at all times. It is

especially important to place transportation personnel at border crossings, ports, and other potential transportation bottlenecks to ensure visibility of freight and to immediately address problems and issues. The transportation expeditors should report all delays encountered immediately to the transportation manager at the main operating location in order to speed resolution of any difficulties.

Demobilization. Demobilization and return of excess inventory temporarily imported into the host nation is essentially accomplished in the reverse order of the process to import the resources. Prior to any movement, the property custodian should inventory all materials departing the site. The same level of urgency applied during build up is not necessary for moving materials out of country.

Disposition of Government Property. Disposition instructions for all remaining government property will come from the government property administrator appointed by the Procuring Contracting Officer. All property shipped from the campsite should be inventoried at the time it is shipped to provide proper accountability records. It should also be inventoried when it arrives at each storage location. Signed transfer documents should be obtained when property reaches its final destination. Those materials designated for redeployment, generally equipment, vehicles and reusable high value materials, can usually be shipped by the most cost effective transportation methods available that satisfy the redeployment schedule. The exceptions are usually small packages and high value electronic goods that would lose visibility and control and be subject to theft on other than secure commercial air transportation. It will again be critical to thoroughly understand and comply with Customs and Immigration requirements for shipments out of the host nation. If strict compliance is not addressed, expect delays of return shipments.

Transfer of Government Property. It must first be determined what resources will be transferred and to whom. Government property to be transferred to NGO or refugee groups after camp construction must be accurately inventoried so its value may be computed and provided to the legal community for transfer documentation. The Defense Resource Management Organization will assist with this process. All legal ramifications must be taken into account and coordinated with military and embassy staffs.

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MANPOWER PLANNING

Initial Staffing. Make every effort to identify key staff at the earliest stages of the project development. Position descriptions listing major responsibilities for each key position must be developed in advance of the deployment. These position descriptions must be provided to the personnel mobilizing to fill these key positions. These individuals should be fully involved and participate in the site surveys and development of major project milestones and timelines. Key individuals on the site survey team, both military and civilian, should be identified and prepared for deployment in advance. There is generally little time available once the decision to build a camp is made, to obtain passports, visas, security clearances and other personal readiness needs. Individuals selected for mobilization to the construction project to fill key management or critical skill positions must be available for the duration of the project. A Time Phased Force Deployment Listing (TPFDL), or similar document for contractor personnel if contractors are used, must be developed and put in place for each refugee camp project. The TPFDL should be front-loaded with enough people with the skills needed to support the construction mission timetable. Advance actions and construction required to support the main construction crews should be completed in advance of starting the construction of the refugee camp. If these two efforts are forced to compete for attention, priority and resources, both tend to be delayed and ineffectively implemented during critical startup time.

Briefings. Each military unit, contractor company or other organization should thoroughly brief all personnel on the living accommodations, climate, local laws and customs, and mission statement before deployment. Ensure all personnel deploy with required clothing, and specialized supplies and equipment that is not already planned for the deployment location.

Local Labor Practices. During the site visit identify local labor brokers for the skilled and unskilled labor positions that may be required. Determine the local requirements for taxes and other deductions that may be required by tax and customs officials. Determine the preferred method of payment for local workers and requirements for prayer times, holidays, and other factors affecting the local work force. Determine local custom regarding feeding and transportation of workers.

COMMUNICATIONS AND INFORMATION TECHNOLOGY SYSTEMS

Purpose. Every project must start with a full range of reliable office and communications equipment. Site personnel must have the capability to communicate with command and project management elements inside and outside the affected country and worldwide. Reliable voice and data communications are vital to effective completion of the camp construction mission. The ability to develop, maintain and transfer official records, documents, construction drawings and plans must be fully developed and available from the first day of the project. If unique or special communications or office equipment is required to support the project, ensure that a properly trained technician is mobilized to the project.

Requirements. Communications requirements drive the configuration of ground equipment and the planner should determine who has to communicate with whom at the site and between the site and support commands. Coordination among all parties will be required to maintain proper control of communications nets and frequencies. Table 2 portrays graphically the minimum connectivity for on-site communications.

Communications with rear area command and support organizations will be critical. Reporting of progress and problems and requests for assistance will necessitate reliable, redundant communications. Use the Communications Checklist contained in Annex E to evaluate the camp's needs and the local areas support capabilities.

	Camp Cdr	C A	N G O	Security	Construction Teams	Fire Teams
Camp Commander	--	X	X	X	X	X
Civil Affairs (CA)	X	--	X	X	X	
NGO	X	X	--			
Security	X	X		--	X	X
Construction Teams	X	X		X	--	X
Fire Teams	X			X	X	--

Table 2. Site Communications Connectivity Requirements.

Basic requirements are:

- A telephone system for efficient incoming and outgoing worldwide calls.
- Uninterrupted incoming and outgoing worldwide FAX capability.
- Reliable access to the internet and e-mail.
- Sufficient laptop or personnel computers to allow routine, timely and professional management and administration of the document and paperwork flow that is created as a result of project development.
- Local area two-way radio network. Radios should be multi-channel to allow assignment of channels to each functional area. Sufficient radios will be procured to ensure the system is widely used to enhance efficiency and safety of project personnel. Ensure there is an adequate number of batteries and recharging equipment compatible with local electric current.
- If there is to be more than one camp, each should be self-sufficient for communications.

Maintaining Communications Equipment. Camp conditions will vary and conditions will determine the level of maintenance required. Preventive maintenance will be a major factor in communications reliability and usefulness. Operators should perform basic daily checks to help prevent major outages. Spare equipment should be kept in a controlled environment, protecting it from pilferage, weather and the environment as much as possible. Preventive maintenance considerations are:

- Dust conditions. Are dust covers provided and are they being used?
- Heat/cold conditions. Are fans needed to provide air-flow around equipment?
- Wet conditions.
- Electrical grounding.
- Connectors.
- Fluctuation in electrical power. Is all equipment that requires constant electrical power protected for power fluctuations by means of power strips or UPSs?

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SECURITY



Figure 17. Fencing. Appropriate fencing serves the dual purpose of safety and security.

Security Issues. Security and protection of U.S. forces, assets and information is no less important during MOOTW than it is during sustained conflict. However, what often surfaces during a humanitarian refugee mission is the need to balance a military security posture with the refugee populations' right not to live in an armed camp. Populations that are displaced because of internal military struggle, civil war or revolution may welcome enhanced security; but in other

situations, the appearance and use of stringent security tactics may be overwhelming and operate to the detriment of the political objectives of the mission. NGOs may be particularly sensitive to overt security tactics. During the mission planning stage, there is always an opportunity to educate NGOs to the need for security, negotiate the level and gain their “buy-in”. Notwithstanding NGO sensitivity, the U.S. government has the obligation to protect U.S. forces, civilians and assets.

Rules of Engagement (ROE). The following is quoted directly from Joint Pub 3-07.

Restraint. Apply appropriate military capability prudently. A single act could cause significant military and political consequences; therefore, judicious use of force is necessary. Restraint requires the careful balancing of the need for security, the conduct of operations, and the political objective. Excessive force antagonizes those parties involved, thereby damaging the legitimacy of the organization that uses it while possibly enhancing the legitimacy of the opposing party.

ROE Compliance. Commanders at all levels must take proactive steps to ensure their personnel know and understand the ROE and are quickly informed of changes. Failure to understand and comply with established ROE can result in fratricide, mission failure, and national embarrassment. ROE in MOOTW are generally more restrictive, detailed, and sensitive to political concerns than in war, consistent always with the right of self-defense. Restraint is best achieved when ROE issued at the beginning of an operation address most anticipated situations that may arise. ROE should be consistently reviewed and revised as necessary. Additionally, ROE should be carefully scrutinized to ensure the lives and health of

military personnel involved in MOOTW are not needlessly endangered.

Access Control. Access to the camp must be controlled. Perimeter fencing and adequate lighting should be used to channel all traffic through points where control can be exercised. Guarded gates should be used to control entry to the base and construction camps with guarded traffic control points controlling entry to the site as a whole while also providing a method of controlling materials, supplies and people entering and leaving the site.

Badging. All persons authorized access to the camp should be issued distinctive photo identification badges. Easily visible and understood schemes should be developed to control access to certain areas or to services such as dining. A local procedure such as numbering should be used to control the badges. Depending on length of the deployment, periodic reissue may be required.

Local Authorities. In most MOOTW operations, host nation national and local authorities will normally retain jurisdiction in the region. It will benefit the entire operation if early negotiations are undertaken to resolve jurisdictional issues. Where local police or military units may represent a threat to refugee populations, agreement at the national level may be appropriate and where time allows, planners should consider involving the State Department or U.S. Embassy in any agreement. It is foreseeable that time constraints could preclude a negotiated agreement and the Air Force would have to act unilaterally to establish appropriate security. In such cases, the camp commander should still ensure that local police or military units understand the U.S. position at the earliest possible time.

Use of Local Police Authority. U.S. forces personnel will not normally have jurisdiction over host nation civilians even inside the

boundaries of a U.S.-built camp. Local civilian police or if appropriate, local military can be used effectively at traffic control points and inside the camp for law enforcement matters. In some cases, particularly where local police may represent part of the threat to the refugee population, it may be necessary to limit their authority. Air Force Security Forces and other camp security forces should contact local police authorities as early in the operation as possible. Exchange of radio frequencies, patrol routes and boundaries should be coordinated daily.

Personnel Security. Depending on the situation, personnel movement may be dangerous, particularly for those who may be carrying money. In some instances all movement will require armed escort. Accurate determination of the local situation, coordination with local authorities and adherence to proper operations security (OPSEC) and communications security (COMSEC) procedures will reduce the threat to personnel. In many third world countries, local purchases will have to be made with cash – a fact that will become quickly known. Air Force or contractor personnel will be at risk from local populations and perhaps local authorities seeking their shares. This threat should be assessed early and appropriate measures taken to provide the necessary security, such as armed escort, bodyguards, local banking arrangements for cash payment, payroll services through a broker, etc.

Property Security. In most cases where a refugee situation exists, everything has value and nothing is immune to theft. All property, both government and personal, must be controlled and secured. Property control systems should be designed to safeguard property and provide an accurate record of its cost, use and disposition.

SAFETY

Purpose. Contingency refugee camp operations will involve fast paced activities and crowded events. The potential for accidents will be high. The goal of any safety program is simple – keep people from getting injured or killed. Achieving that goal in this type of operation will be challenging and requires a professional approach and the continuous attention of everyone.

Refugee Population Control. Refugee populations may be present at the camp at the same time you are trying to build roads, dig borrow pits, work heavy equipment, and perform other potentially dangerous operations. Refugee populations include large numbers of children who are naturally curious and have no inherent safety sense. The operation of heavy machinery around children presents an attraction that draws attention and must be constantly controlled. The pressures of living in a camp affect adults too and may lessen safety consciousness.

Stress. Even the toughest airman will endure unfamiliar stress during refugee operations. Some U.S. military personnel may be unprepared to deal with the suffering, injuries, deaths and poverty witnessed during many refugee operations. Expect chronic and traumatic stress reaction during refugee operations. Continuous around-the-clock operations and long work hours dull the senses. These factors can divert attention from safety. Medical personnel should be constantly alert for the various indicators of stress reaction and be prepared to order appropriate treatment.



Figure 18. Bulldozer with Children.

Work Force Safety. Safety of the work force will be very challenging to maintain. The most difficult challenges will be in dealing with the differences between the level of safety practices common to the indigenous work force and those practices common to government, military and contractor operations. Plan ahead for a lack of basic safety training on the part of local employees and the complete lack of basic safety equipment such as safety shoes, gloves, hard hats, eye protection and hearing protection. Vehicle and heavy equipment operations will require extensive training and safety enforcement throughout the construction project.

Responsibilities. The field safety organization should be considered during the planning stages of an operation. If a civilian contractor is involved in camp construction or operations and maintenance, the statement of work should specify that an adequate safety program be staffed and in place prior to construction start up. This normally means the contractor should have a safety plan, a set of modifying procedures for local conditions, a specified safety organization, a designated safety officer and appropriate safety observers for critical operations. The most appropriate safety program will fail, however, if the local population does not embrace the basic principles. Ensure that the complexity of the safety program does not exceed the work force's ability to grasp it. Safety awareness and enforcement must be the highest priority during all phases of the planning, construction and sustainment of the project. As detailed in other sections of this document, projects like constructing a refugee camp happen very quickly and the pressure and desire to complete the camp as quickly as possible will be nearly unbearable. To meet the very optimistic construction milestones that will no doubt be levied on site personnel, resources, supplies and equipment will be pushed to their limits. All this will most likely occur in a remote location under incredible stress for everyone involved. It will be tempting to use expedient methods or work extended hours for a protracted period of time to build the camp. It is during these times that safety may suffer and commanders, supervisors and every worker must be vigilant regarding safety.

Specific Issues and Assumptions. There will be many safety issues to plan for and implement during the construction of refugee camps. Consider the following as you make safety plans:

- The project will be very fast paced and possibly involve multiple locations.
- The local work force will be largely unfamiliar and uneducated regarding safety. In third world countries, child labor may be common and safety totally ignored.

- ➔ The local equipment standards will probably be very poor. Most equipment available will be old and will have little or no regular maintenance accomplished. Weight handling equipment and material handling equipment will not be tested or certified in most third world countries.
- ➔ There will be a lack of specific basic safety equipment and a lack of desire to use it once issued. Safety concepts may be completely foreign to the local work force and safety concerns seen as an impediment to work progress. Work-arounds may be common and dangerous.
- ➔ No local safety regulations exist in many countries or enforcement by host nation authorities may be lacking.
- ➔ The local hospital and treatment facilities to treat workers will probably be very poorly equipped. This may necessitate the Air Force providing medical capability to treat local worker injuries.
- ➔ The legal liability that the Air Force will assume for injuries/deaths in foreign countries during the project may be significant. Check local laws and customs.
- ➔ Communication barriers will exist because of multiple languages spoken by the work force and the managers and supervisors. Plan to communicate safety concepts in the native language through interpreters and signage in the local language.
- ➔ Transportation on and off the job site will create safety concerns. Operating unfamiliar vehicles in a new environment, on an unfamiliar road system with a unique driving etiquette will cause safety concerns. Again, minor accidents can be complicated by a lack of proper recovery and medical equipment.
- ➔ Operating specialty vehicles such as 4-wheel all terrain vehicles and bicycles will cause safety concerns. Ensure that

all vehicle operators are made aware of the particular dangers these vehicles pose.

- It is common for manufacturer-installed safety guards to be removed or bypassed.
- There may be military and civilian air operations close to the construction site. This will require the establishment and safe management of a safe aircraft landing zone. Helicopter operations will also attract interest and need to be managed from a safety standpoint. If required for the mission, airdrops should be carefully considered and controlled to avoid injuries.
- Portable power generators could be required to provide some or all of the camp power requirements. These units require specific grounding procedures, regular refueling, temporary wiring and extension cords and unattended operation. Most generators are self-starting units and can be dangerous to uninformed or improperly trained personnel. Power distribution and lighting systems need to be controlled, including the proper use of lockout/tag out procedures.
- Unauthorized observers will be nearly impossible to keep out of the construction area. Danger will come from the operation of heavy equipment supporting a robust construction schedule. There will be around-the-clock heavy equipment operations throughout the project area. Appropriate fences, flagmen and sufficient safety observers will need to be addressed and provided. Do not depend on the equipment operator to be in charge of safety because he/she will be concentrating on the operation and not the surroundings.
- Vehicle and equipment operators will routinely be tempted to drive at excessive speeds while attempting to complete tasks as quickly as possible.
- Unfavorable weather will affect camp construction operations. When safety is affected, procedures must be clearly defined

for the suspension of operations, dealing with hazardous road conditions and hazardous working conditions. If operations must continue, proper staging of rescue equipment, such as cranes and rigging needs to be considered.

- Working safely in hot or cold weather can be especially challenging. Safety rules must ensure protection of temperature-related injuries and provide adequate rest breaks and all the drinking water the work force can consume. Safety observers and supervisors must be trained to provide proper surveillance of personnel to look for temperature-related problems.
- Around-the-clock operations can be safely implemented if proper planning is accomplished. Provision of proper lighting, worker security and procedures for nighttime heavy equipment and vehicle operations can keep accidents off the job.

Lifting. Significant attention must be paid to the safety considerations during all lifting operations. During the planning phase provision of safe and appropriate rigging and lifting gear must be addressed. The condition of cranes and lifting equipment will very likely be poor so provisions should be made. Safety practices of the local work force will probably not comply with standard industry practices. Adequate qualified safety personnel should be planned to ensure safe practices are maintained. Riding loads, walking under loads, improper slinging procedures and uncertified equipment will be common. Heavy lifts may require tandem or triple lifts using the available undersized equipment – a difficult and dangerous procedure under the best of circumstances. Where unavoidable, these operations need to be totally controlled.



Figure 19. Lifting Operations.

Unexploded Ordnance (UXO). Plans must be developed and put into place to deal with the discovery and proper handling of unexploded ordnance discovered during construction. Ordnance is a real potential during operations in third world countries that may have been involved in civil war or border wars. The local work force or local refugee population will be totally ignorant about UXO procedures. Develop a workable plan to deal with UXO.

HAZMAT Storage. There will be a need for hazardous and controlled materials to be brought into the camp. Persons who come into contact with items such as liquid fuels, bottled natural gas and propane, cleaning supplies and other items must be prepared to work with them safely. Understand the risks and provide training, safety devices,

proper storage and treatment facilities, such as eyewash stands, showers and fire extinguishers.

Fuel Storage. Safe handling procedures for bulk fuel storage must be developed for the construction camp. Bottled gas is commonly used for cooking in refugee camps. Attention must be paid to proper storage of bulk supplies – away from and downwind of populations.

Vector Control. Because refugee camps will most likely be constructed in remote, open areas, there may be a danger from animals, insects, snakes and plants. Proper knowledge of the dangers of the local area must be obtained during the site visit and provided for during the planning phase. Unique medical remedies required to address local dangers should be provided. Refugee camps will attract rodents, dogs and wild animals with a potential for disease and injury. Consider disposal methods carefully, monitor pest populations and develop eradication plans. Medical units may have to be equipped with anti-venom if local hospitals are incapable of treating bite injuries.

Evacuation. Because of the potential for hostilities coincident with a refugee crisis, it is prudent to plan for the emergency evacuation of all contractors, military and non-government personnel that are assisting with the construction project. Contractors should be charged with developing their own plans for evacuation both with and without military assistance.

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DCS/Installations & Logistics

REFERENCES

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- Air Force Doctrine Directive 2-3 – Military Operations Other Than War
- Joint Publication 3-07 – Joint Doctrine for Military Operations Other Than War
- AFI 10-403 – Deployment Planning
- AFI 10-404 – Base Support Planning
- AFI 31-207 – Arming and Use of Force by Air Force Personnel
- AFM 10-401, Volume 1 – Operation Plan and Concept Plan Development and Implementation
- AFM 10-401, Volume 2 – Planning Formats and Guidance
- AFPAM 10-219, Volume 5, Bare Base Conceptual Planning Guide
- AFPAM 10-1403 – Air Mobility Planning Factors
- AFH 10-222, Volume 6, Guide to Bare Base Facility Erection
- USAID Field Operating Guide, Volume 3
- UNHCR Handbook for Emergencies, Part One, Field Operations
- The Sphere Project Humanitarian Charter and Minimum Standards in Disaster Response
- Engineering in Emergencies, A Practical Guide for Relief Workers, Jan Davis and Robert Lambert, IT Publications, 1995
- Project History and Final Report, Operation Sustain Hope, 1999
- Yearbook of International Organizations

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ANNEX
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GLOSSARY

Affected Country Term used to define a country stricken by a disaster.

Affected Population People requiring immediate emergency assistance from outside sources as a result of a disaster situation or event.

Assisting Country Term that more specifically defines a country providing aid to a disaster-stricken country (affected country). Assisting countries may or may not be a donor country.

At-Risk Populations A group that may suffer the effects of drought, conflict, food insecurity, or other phenomena resulting in humanitarian hardship.

CARE (Cooperative for Assistance and Relief Everywhere) International A confederation of 10 agencies that delivers relief assistance to people in need and long-term solutions to global poverty.

DART (Disaster Assistance Response Team) Name for Office of Foreign Disaster Assistance's field operational response capability. (See OFDA)

Displaced Person A civilian who is involuntarily outside the national boundaries of his/her country.

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Fast Onset Disasters Also known as sudden or quick onset disasters. Disasters such as earthquakes, hurricanes, volcanic eruptions, floods, and tsunamis.

Host Country Country in which the refugee camp is to be built.

MERLIN (Medical Emergency Relief International) British humanitarian organization, set up to provide medical relief in the first phase of international emergencies.

NGO (Non-Government Organization) Refers to transnational organizations of private citizens that maintain a consultative status with the Economic and Social Council of the United Nations. NGOs may be professional associations, foundations, multinational businesses, or simply groups with a common interest in humanitarian assistance activities (development and relief). NGO is a term normally used by non-U.S. organizations as the equivalent of the term PVO (see PVO) as used in the United States.

OFDA (Office of U.S. Foreign Disaster Assistance) Part of USAID's Bureau for Humanitarian Response. Office responsible for the coordination of all U.S. Government assistance to foreign countries after a natural or manmade disaster.

Plastic Sheeting OFDA contracts for the manufacture of a specially coated, scrim net, plastic sheeting that is both durable and long lasting. OFDA distributes the plastic sheeting in rolls (one roll/box) that are 24 feet wide and 100 feet long.

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PVO (Private Voluntary Organization) Private nonprofit humanitarian assistance organizations, registered with USAID, that are involved in development and relief activities. PVO is the equivalent term of NGO, which is normally used by non-U.S. organizations. (See also NGO.)

Refugee A person who is outside of his or her country of origin and who, because of a well-founded fear of persecution, is unable to return to the country or to prevail upon that country for protection.

SATCOM System (Satellite Communications System) Refers to commercial systems, such as International Maritime Satellite (INMARSAT), or military owned and operated communications system, which can provide almost worldwide communications for voice, data, and fax using a system of geostationary satellites.

SITREP (Situation Report) A situation report on the current disaster situation and on the current U.S. response activities. Completed as required.

Slow Onset Disasters Disasters that develop over a period of time. Examples are famine, civil strife, and insect infestations.

UN (United Nations) International organization formed to promote international peace, security, and cooperation under the terms of the UN Charter.

UNHCR (The United Nations High Commissioner for Refugees) This UN agency is responsible for protecting refugees, seeking permanent solutions to refugee problems by facilitating voluntary repatriation and resettlement, and

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providing supplementary aid and emergency relief to refugees as necessary. Headquartered in Geneva.

WHO (World Health Organization) UN organization responsible for coordinating international public health work. Headquartered in Geneva.

USAID (U.S. Agency for International Development) The official U.S. Government agency responsible for international assistance and development.

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CONTRACTOR-SPECIFIC
PLANNING AND CONSTRUCTION

Organization.

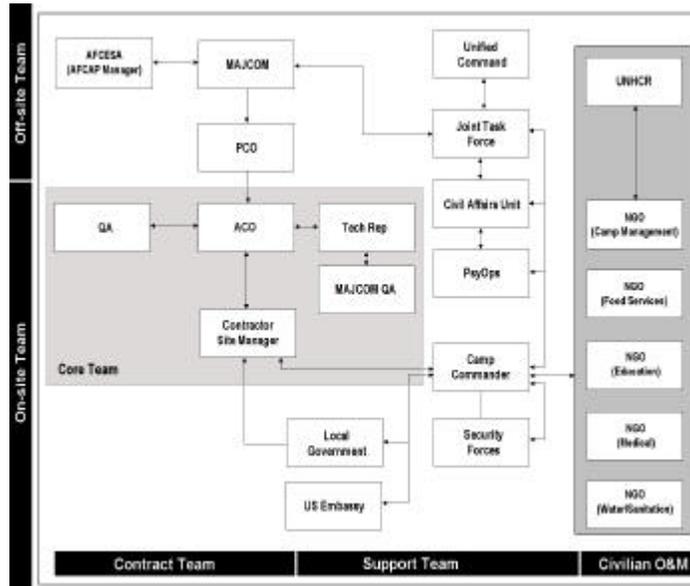


Figure 20. Organization Chart with Contractor.

Organizational Differences. If a contractor is used for construction of the camp, some organizational differences are

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needed to provide contract oversight and direction. Figure 21 depicts a typical site organization that includes a contractor. The major difference is the addition of the contractor and contract administration functions. The role of the NGOs and the headquarters command functions are constant.

Core Team. The Core Team consists of the following organizational elements whose primary focus is on the site.

Administrative Contracting Officer (ACO) – The individual delegated by the Procuring Contracting Officer (PCO) to conduct on-site contract administration of the task order or contract. The ACO may be assigned from the Major Command (MAJCOM) or from the Defense Contract Management District-International (DCMD-I.) ACOs must be thoroughly familiar with the task order and contract vehicles used for the project, as well as the Federal Acquisition Regulations (FAR), Defense Federal Acquisition Regulations (DFARS) and the Air Force Federal Acquisition Regulations (AFFARS.) In addition, the ACO should be mentally and physically capable of working under field conditions such as those found in a refugee camp scenario. This individual directs the Quality Assurance Evaluator (QAE) and interfaces directly with the Technical Representative (Tech Rep). The ACO is the sole individual with authority to modify the contract, approve changes and issue modifications on site.

Technical Representative (Tech Rep) – The individual appointed to serve as the Air Force’s on-site technical expert. The Tech Rep will also be the contractor’s point of contact and liaison for all technical matters related to

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the contract. The Tech Rep may have additional QAEs assigned to evaluate various technical issues. The Tech Rep is normally a qualified Air Force Civil Engineer (AFS: 32E3G, 3E571, or 3E671) for construction contracts or a qualified Services Officer (34M3 or 3M091) for services type contracts. Tech Reps should be thoroughly familiar with the contract, statement of work and principles of performance based contracting.

Quality Assurance Evaluator (QAE) – An individual or individuals appointed to evaluate the contractor’s compliance with the contract requirements. The QAE will document and appraise contractor performance and submit performance evaluations as required by the ACO, PCO and Program Manager (PM). The MAJCOM that is the contract owner or DCMD-I must provide QAEs. QAEs must be thoroughly familiar with construction, engineering and services contracts, FAR, DFARS, AFFARS, the contract technical specifications and task order specifications. In the selection of on-site surveillance personnel, care must be taken to ensure the personnel appointed understand the need for objective, fair, and consistent evaluations of contractor performance.

Contract Team– The Contract Team includes the Core Team and is made up of those agencies concerned and charged with carrying out the contract, meeting schedule and delivery of the final product. Besides the Core Team the members of the Contract Team are:

Contractor – A civilian contractor may be involved with specific phases of a refugee contingency operation.

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Under the Air Force Contract Augmentation Program (AFCAP) concept, a contractor can provide:

- ➔ Site Survey and Site Specific Management Plan development.
- ➔ Mobilization planning.
- ➔ Deployment support and sustainment of facilities and equipment. Civil Engineering functions of management, airfield support, infrastructure support, environmental management, emergency management, reconstitution, facility construction, maintenance and repair and land clearing.
- ➔ Services functions of feeding, troop support, lodging, laundry, fitness, recreation, and janitorial services.
- ➔ Logistics functions including materiel support, transportation, communications, and mobility asset management.
- ➔ Backfill of deployed base functions.

Procuring Contracting Officer (PCO) - The PCO is the duly appointed government agent authorized to award, modify, and administer contracts. This individual can obligate the government in performance of the contract, including any subsequent changes to that contract. If the project is run under the AFCAP contract, the PCO resides at the 325th Contracting Squadron's Specialized Flight (325CONS/LGCX), Tyndall AFB, FL.

Air Force Civil Engineer Support Agency (AFCESA)
 – Program Manager for the Air Force Contract Augmentation Program (AFCAP). Additional

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information on AFCAP can be found at:
<http://www.afcap.com/conops.html/>.

USAF Major Command (MAJCOM) – The role of the USAF MAJCOM in whose area of operations the camp is to be built changes if a contractor is used. The MAJCOM provides the Air Force civil engineering oversight of the project. They provide technical representatives and may provide ACO and QAE support. If AFCAP is used, tasking and funding flows through the MAJCOM Civil Engineer to AFCESA.

Command and Control Issues. If a contractor is used to build the camp, the construction base camp design will be rapidly developed by the site survey team and will involve individuals from several organizations. The site survey team will be led by the civil engineer/engineering manager and should fully study the requirements of each group and incorporate these requirements into the plan. The site services manager (SSM) works closely with the site manager and the civil engineer/engineering manager and engineers designing the base camp. The SSM will be responsible for the majority of day-to-day operations and maintenance of the camp when it is occupied. It is necessary to meet the needs of each group as much as feasible. The principal organizations are:

- ➔ Non-government organizations.
- ➔ Prime contractor personnel.
- ➔ Governmental organizations.
- ➔ Visitors, vendors, and manufacturers' representatives.
- ➔ Subcontractors.

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Contractor Communications.

General. If a contractor is involved in the camp, the communication required will be somewhat more complex. There will be more functions needing to communicate within the camp and a larger requirement voice and data communications. The following table

	A C O	Q A	T R	C C	C A	N G O	Security	Contractor
ACO	--	X	X	X			X	X
QA	X	--						
Tech Rep (TR)	X	X	- -	X				X
Camp Cdr (CC)	X		X	--	X	X	X	X
CA	X		X	X	--	X	X	X
NGO				X	X	-		
Security	X			X	X		--	X
Contractor	X		X	X	X		X	--

Table 3. Site Communications Connectivity with Contractor.

Recommended Equipment. The following is a suggested list of materials needed to support the camp with communications.

➔ Radios

Multi-channel 2-way radios with batteries, antennas and spares.

Multiple position recharging stations.

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- Satellite Phones
 - Phones with batteries, antennas and spares.
 - Multiple position recharging stations.
- Telephone System
 - PBX.
 - Trunk cards and spares.
 - Digital cards with spares.
 - Analog cards and spares.
 - Analog phones and spares.
 - Uninterruptible Power Supply. (UPS)/conditioner with spares.
 - Cables for switch connections to phones and trunks.
 - Lightning arrestors.
 - Jumper wire.
- Data System
 - Routers.
 - Data switches.
 - Hubs.
 - Interface cables to phone system, trunks, and/or satellite system.
 - UPS.
 - Patch panels.
 - Cabling system.
 - Category 5 data cable.
 - Category 3 phone cable.
 - Underground 12-pair cable.
 - Ariel cable panels.
- Cabling system
 - Category 5 data cable.
 - Category 3 phone cable.
 - Underground 12-pair cable.

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- Ariel cable.
- Strain relievers for ariel cable.
- Satellite terminals
- Fax machines with spares
- Computers, Software, Printers, Scanners
 - Laptop computers with spare batteries.
 - Network Interface Cards and connectors.
 - Zip drives for storing large computer files.
 - Software.
 - Microsoft Office Professional™.
 - Microsoft Project™.
 - Internet connections.
 - Black and white Laser Jet Printers.
 - Color Laser Jet Printer.
 - Scanners.
 - Uninterruptible Power.
 - Supplies/Conditioners.
- Miscellaneous supplies needed for communications package.
- Canned air for maintenance of electronic equipment.
 - Dust covers for all computers, battery stations, printers, scanners, etc.
 - Telephone jacks.
 - Phone cords.
 - Printer cartridges.
 - 3.5 inch diskettes.
 - Grounding rods.
 - Cable ties and securing equipment.
 - Printer paper.
 - Power/surge protectors.

ANNEX C

Communications Maintenance. Camp conditions will vary and conditions will determine the level of maintenance required. Preventive maintenance will be a major factor in communications reliability and usefulness. As a rule, there should be at least a weekly preventive maintenance check on all communications equipment. It will be necessary for the operators to perform some basic daily checks to help prevent major outages. A checklist should be generated for the operators; this will allow those checks to be performed. Spare equipment should be kept in a controlled environment, protecting it from the pilferage, weather and environment as much as possible. Preventive maintenance considerations are:

- ➔ Dust. Are dust covers provided and are they being used?
- ➔ Temperature. Is airflow around equipment adequate?
- ➔ Electrical grounding.
- ➔ Connectors.
- ➔ Fluctuation in electrical power. Is all equipment that requires constant electrical power protected for power fluctuations by means of power strips or UPS?
- ➔ Usage. Equipment being used outside in the weather will need more care than equipment in office environment.

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ANNEX

USEFUL WEBSITES

Topic	U.S. Government Websites (Stable)
Diplomacy	U.S. Department of State -- Bureau of Consular Affairs http://travel.state.gov/
U.S. Law	U.S. House of Representatives – Office of the Law Revision Council http://uscode.house.gov/usc.html
Foreign Law	Library of Congress -- Global Legal Information Network http://lcweb2.loc.gov/law/GLINv1/
Medical Information	Centers for Disease Control and Prevention http://www.cdc.gov/
Foreign Embassies	The Electronic Embassy http://www.embassy.org/embassies/Embassyweb.com http://www.embpage.org/
Links to U.S. Embassies Worldwide	Links to United States Embassies and Consulates Worldwide http://travel.state.gov/links.html
Security	Overseas Security Advisory Council – U.S. Department of State http://ds.state.gov/osac/
Non-Government Organizations	The Union for International Organizations http://www.uia.org

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ANNEX III

SITE SURVEY CHECKLIST

The following site survey checklist is intended to assist the site survey team in planning and conducting a complete initial assessment. It is based on the U.S. Agency for International Development Field Operations Guide, as well as the requirements necessary to implement immediate refugee camp planning and construction. The checklist is meant to be as inclusive as possible, as to the types of initial questions that need to be answered for construction of a refugee camp under conditions of relative hardship. Some of the questions in the checklist will require extensive survey work, which the team may not have the capacity to perform. In some cases, the information needed may already exist, and the task of the team may be to gather site information others have assembled. Such information must however, be evaluated for accuracy, timeliness and completeness.

Item	Notes
GENERAL	
Determine the approximate number of refugees both initially and long-term.	
Determine current location of refugees.	
Determine rate of refugee arrival along with mode of travel.	

ANNEX E	Item	Notes
	Determine possible land use impediments such as grazing rights, prior occupancy and disputed ownership.	
	POPULATION	
	Determine refugee composition. Will they be scattered individuals, families, village groups?	
	What is the average family size?	
	Determine approximate ages of men, women and children.	
	Identify ethnic origin. Sedentary or nomadic background? Role of female in society? Customary skills? Language used? Basic diet? Customary shelter? Customary sanitation practices? General distribution of socioeconomic status?	
Identify relative health of local population and refugees. Mortality rate? Main cause of death? Percentage vaccinated? Incidents of diarrhea?		

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Item	Notes
LABOR	
Determine who controls or manages the local labor market.	
Is there one local broker who can supply labor to meet the needs of all aspects of the camp?	
Identify sources of bilingual personnel - check with schools, libraries and government agencies for people available to serve as interpreters.	
What are related work skills of local population?	
Identify any committees, government agencies, action groups, or NGOs that can help mobilize sources of labor.	
Determine if residents of the camp or refugees living in the local area can be employed on the project.	
Obtain detailed maps of the general area and construction site.	
PETROLEUM AND FUEL	
Determine fuel types, availability and cost.	
Determine fuel distribution and storage capability.	

ANNEX E

Item	Notes
WATER	
Determine required amount of water per person per day.	
Determine source and quality of water.	
Determine the evidence of water-related diseases.	
Determine availability and adequacy of water treatment facilities, pumps and distribution network.	
Determine types of wells, transportation, and/or storage systems used.	
Determine if there are any problems with well repair/rehabilitation.	
Determine if the local water system is functional. What are the requirements for repair?	
Determine the availability of additional sources of safe water.	
Determine who is in charge of the local water supply.	
Assess condition of canals and downstream channels.	
SHELTER	
Determine from local officials the expected climate and weather conditions for the construction	

ANNEX E

Item	Notes
period.	
Determine the number of people requiring shelter and whether the need for shelter is temporary (a few weeks), or if it is a refugee population that will require shelter for an indeterminate period of time.	
Determine the type of structures that will be required (tent, portable building, existing buildings).	
Determine the average number of people allowable in an individual dwelling.	
Identify obstacles that prevent victims from meeting their own needs for shelter.	
Inventory existing structures and public facilities that can be used as temporary shelters, giving careful consideration to access to sanitation and water.	
Determine the number of private dwellings and public facilities (schools, churches, medical facilities) that will be required.	
Assess the suitability and infrastructure of any available existing facilities.	

ANNEX E

Item	Notes
ELECTRICAL POWER	
Determine minimum essential electrical power requirements.	
Determine local and regional suppliers, cost and availability.	
Determine availability of technical and maintenance support.	
Determine the power system operability. Power generation facility. Number of substations and condition. Fuel source. Output capacity. Switching facilities. Transmission facilities. Distribution facilities.	
MATERIALS	
Determine types and sources of local construction materials.	
How far are the materials from the site?	
What is the availability and cost to meet both cultural and religious requirements?	
Are there locally available substitutes?	

III

ANNEX

Item	Notes
What is the competition for these materials?	
Determine types and quantities of materials that the local government can provide.	
Determine the accessibility of site for the delivery of materials.	
Determine the availability of transportation for the delivery and distribution of materials.	
Assess the environmental conditions that would impose constraints on the supply and distribution of materials.	
Determine quantity and quality of tools available locally.	
<p>Key materials that will probably be required in large quantities:</p> <p>Civil Materials.</p> <ul style="list-style-type: none"> Gravel. Rock (round and angular). Plywood. Culvert. Lumber. Fencing. <p>Mechanical Materials.</p> <ul style="list-style-type: none"> Water piping and fittings. Hydrants. Hot water tanks. Pumps. Portable latrines. 	

III

ANNEX

Item	Notes
Portable heaters. Storage tanks. Water treatment chemicals. Electrical Materials. Cable. Transformers. Fixtures.	
SANITATION AND SEWAGE	
Determine population estimate and density.	
Determine placement and number of latrines.	
Determine if cultural taboos affect design and placement of latrines.	
Determine local customs of waste disposal. What facilities do the refugees use at home?	
Develop sanitation plan for unexpected population increase.	
Determine how to ensure safe access to latrines for women and girls.	
Determine any evidence of water-related disease.	
Determine the proximity of latrines and refuse areas to water sources, storage areas and distribution points.	
Determine collection and disposal plan for garbage.	

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Item	Notes
Determine adequacy of sewage disposal facilities in public buildings or facilities.	
Determine availability of local technical and maintenance support.	
Determine availability of existing treatment facilities.	
Assess site topography and natural drainage patterns.	
Assess soil permeability and characteristics. Can pits be hand dug?	
Determine elevation of groundwater table.	
Determine if latrines can be built locally.	
Determine if portable latrines and servicing are available and acceptable.	
Identify the sources and types of refuse. Prioritize the sources as to existing and potential health hazards.	
Determine how to control and dispose of refuse according to potential hazard ranking.	
TRANSPORTATION	
Ports	

ANNEX E

Item	Notes
Visit seaports, airports and border crossings that may be used in support of the camp construction and operation.	
Meet local tax and customs officials and ensure there is a clear process and procedure for clearing supplies and equipment into the camp area.	
Obtain telephone numbers for all officials that can help resolve problems and delays.	
Determine availability of helicopter landing sites.	
Determine port costs, limitations and restrictions.	
Determine airport operational capacity, restrictions, limitations, military and civilian traffic.	
Determine port night, weekend and holiday operation capability.	
Determine fuel availability.	
Determine port storage availability.	
Determine landing and docking clearance requirements.	
Determine port security requirements.	
Surface Transportation (Road and Rail)	

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Item	Notes
Determine condition of road network.	
Identify restrictions such as weight, length or height limitations at bridges and tunnels.	
Identify alternate supply routes and bypasses.	
Determine adequacy of local traffic control.	
Determine if containers can be moved inland.	
Determine availability and cost of trucks (government and commercial).	
Determine size, quantity and number of commercial vehicles.	
Determine availability of maintenance facilities and spare parts.	
Determine availability of fuel along delivery routes.	
Determine location, availability, cost and reliability of railroads in the area.	
Determine security measures to protect rail cargo in transit.	
WAREHOUSING	
Validate sources, quantities, quality and storage.	
Identify usable warehouse space, cost and capacity over time.	

<div style="writing-mode: vertical-rl; transform: rotate(180deg);"> ANNEX </div>	Item		Notes	
	Determine if warehouse space is commercially or government owned.			
	Determine availability of warehouse material handling equipment.			
	Determine warehouse security levels.			
	SUPPORT FACILITIES AND EQUIPMENT			
	Obtain a detailed list of suppliers willing to do business with the camp.			
	Determine the method of payment each local company will accept.			
	Determine availability of local hotels that may be used as temporary living facilities.			
	Meet with local bank officials and ensure all bank rules, procedures and restrictions are fully understood.			
	Determine how the transfer of funds will be executed with local banks.			
	Determine availability of local area personnel transportation.			
	Determine availability and capability of local health facilities.			
	FOOD			
	Identify all possible local food sources.			
Determine local farming procedures that are used to grow crops.				

III

ANNEX

Item	Notes
Determine bakery availability and capability.	
Determine availability of local food preparation and distribution facilities.	
Determine if there are legal impediments to importation of certain foods?	
Determine veterinary/military public health approval requirements?	

Communications Site Survey and Planning Checklist. The contractor's communications function should use a checklist similar to this one to determine site requirements if the contractor is tasked to provide communications during camp construction.

Item	Notes
General	
How many people are deploying who need communications? Contractor? Government?	
How many camps are to be established? Each should be self-sufficient.	
Is the initial deployment package sufficient to support deployed personnel?	
What is the degree of integration between military and civilian communications networks?	

III

ANNEX

Item	Notes
What communications facilities exist that are operable or easily repaired?	
Is military support available?	
Are there any unique requirements?	
Who needs full time voice and fax? Contractor? Government?	
Who needs full time data services? Contractor? Government?	
Who needs e-mail? Contractor? Government?	
Can the local telephone system provide the needed support?	
Is there a local work force that can support camp communications effort?	
Is a local internet service provider available?	
Are satellite phones needed for initial deployment? How many? Contractor? Government?	
Is high-speed data support available?	
Who needs cellular service and when? Contractor? Government?	
Is a cellular system available?	
Are there host nation cellular phone restrictions?	
Can we purchase telephones in U.S. and have local provider install proper chips?	
Does local provider have cellular FAX and data available?	
Who needs 2-way radio service and	

III

ANNEX

Item	Notes
when? Contractor? Government?	
Will they need private channels? Contractor? Government?	
Can multi-channel hand-held radios be imported or must they be acquired locally?	
If acquired locally, how will they be purchased or rented and who can provide that service?	
Who provides and manages radio frequencies and call signs?	
Total number of telephone users. Contractor? Government?	
How many trunks?	
How many telephones?	
Are multi-line telephones needed? Is a T-1 telephone line needed for voice and data?	
How many faxes will be in use? Contractor? Government?	
How many computers will be in use? Contractor? Government?	
How much cable is needed?	
Are Very Small Aperture Terminals (VSATs) overloaded? Are more VSATs needed?	
Are routers needed for the data system?	
Is a data switch needed for data system?	
Is there a need to separate data from the voice system?	



ANNEX

Item	Notes
Can local infrastructure support local communications between camps?	
Are line of site (LOS) radios needed for camp interconnectivity? What bandwidth is needed?	