UNITED STATES MARINE CORPS
ENGINEER EQUIPMENT INSTRUCTION COMPANY
MARINE CORPS DETACHMENT
14813 EAST 8TH ST
FORT LEONARD WOOD, MISSOURI 65473

LESSON PLAN

PLAN SURVEY SUPPORT FOR THE CONSTRUCTION OF A BASE CAMP

EAC-**A01**

ENGINEER ASSISTANT CHIEF COURSE

A16EAV1

REVISED 08/01/2014

APPROVED BY _____ **DATE** _____

(ON SLIDE #1)

INTRODUCTION: **(5 MIN)**

1. **GAIN ATTENTION.** The Marine Corps operates in all operational environments from relatively stable and peaceful humanitarian missions through the unstable insurgency environments to open combat of general warfare. Regardless of where you will be operating, there will be a need for base camps to conduct operations from. It is the role of the combat engineer and engineer community to facilitate and support base camp construction as well as to provide life support operations.

(ON SLIDE #2)

2. **OVERVIEW.** During this lesson we will discuss the cantonment planning process, site selection, site planning, required facilities and site closure and clean-up, and safety.

INSTRUCTOR NOTE
Introduce Learning Objectives.

(ON SLIDE #3-5)

3. **LEARNING OBJECTIVES.**

a. TERMINAL LEARNING OBJECTIVE.

(1) Given a tactical situation, a map, operations order, commanders intent, size of unit to occupy base camp, and references, plan survey support for the construction of a base camp providing the commander with precise GPS locations of all essential structures in support of the concept of operations and commanders intent . (1361-XENG-2002)

b. ENABLING LEARNING OBJECTIVES.

(1) Given a tactical situation, a map, an operations order, commanders intent, and references, analyze METT-T from a general engineering perspective per the MCRP 3-17A. (1361-XENG-2002a)

(2) Given a tactical situation, a map, operations

order, commander's intent, a unit to occupy forward tactical operations base, and references, determine the feasibility of using existing infrastructure to satisfy the commander's intent per the MCWP 3-17. (1361-XENG-2002b)

(3) Given a tactical situation, a map, operations order, commander's intent, a unit to occupy forward tactical operations base and references, determine necessary survivability measures to reduce the effects of an enemy attack in an urban environment per the MCWP 3-17.6. (1361-XENG-2002c)

(4) Given a tactical situation, a map, an operations order, commander's intent, the size of a unit to occupy a cantonment, and references, determine a suitable location for the cantonment site on a map that satisfies the commander's intent per the MCWP 3-17. (1361-XENG-2002d)

(5) Given a tactical situation, an operations order, commanders intent, the size of a unit to occupy a cantonment, survey set GP, a computer work station, plotter, and references, design a cantonment site so that operational risk is minimized while meeting the provisions of the concept of operations and the commander's intent per the MCWP 3-17. (1361-XENG-2002e)

(6) Given a tactical scenario, a map, an operations order, commander’s intent, and references, identify items needed in a briefing packet relevant to a cantonment plan per the MCWP 3-17. (1361-XENG-2002f)

(7) Given a tactical situation, survey set GP, a computer work station, design data for a cantonment, and references, identify procedures to stake out a cantonment site per the design criteria. (1361-XENG-2002g)

(ON SLIDE #6)

4. **METHOD/MEDIA**. I will teach this class using the lecture and practical application method aided by computer aided graphics.

INSTRUCTOR NOTE
EXPLAIN INSTRUCTIONAL RATING FORMS. 100% of students will complete IRFs.

(ON SLIDE #7)

5. **EVALUATION**. You will be evaluated on this period of instruction by briefing your cantonment plan per your training schedule and a written exam.

(ON SLIDE #8)

6. **SAFETY/CEASE TRAINING (CT) BRIEF**. There are no hazards identified during this lecture or practical application of this period of instruction.

(ON SLIDE #9)

TRANSITION: Now that we understand how we will be taught and evaluated, let's begin with a general discussion of cantonment.

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(ON SLIDE #10)

BODY ***(26 HRS 40 MIN)***

1. **GENERAL**. **(30 MIN)**

a. **Definition**. A *Cantonment Area* is a group of **temporary structures** used for the quartering of personnel/troops and the supplies/equipment required to maintain them.

b. **Temporary in nature**. However, existing structures are used whenever possible or in conjunction with the cantonment facility.

c. **MAGTF Capabilities**.

(ON SLIDE #11)

(1) Engineer Support Battalion. Provide engineer support of a deliberate nature to the MAGTF. Cantonment planning is a **primary task** given to the ESB as they have a **heavy capability** in performing that task.

(2) Combat Engineer Battalion. Provide close combat engineer support to the MAGTF. Cantonment planning is a **secondary task** given to the CEB as they have a **light capability** in performing that task.

(ON SLIDE #12)

(3) Engineer Company (MWSS). Provide essential engineer support to the Marine Aircraft Wing. Cantonment planning is a **primary task** given to the MWSS Engineers as they have a **medium capability** in performing that task.

(4) Naval Construction Forces. Provide civil engineer support to the MAGTF. Cantonment planning is a **primary task** given to the "Seabees" as they have a **heavy capability** in performing that task.

(ON SLIDE #13)

d. **Other Services and Capabilities**.

(1) U.S. Army. While their organization does not reflect that of the Marine Corps, they have extensive engineer capabilities. Their definition of "temporary" is different than ours and they tend to build in a more permanent manner than we do.

(2) Air Force. REDHORSE and PRIME BEEF Squadrons provide civil engineering support for forward operations.

(ON SLIDE #14)

e. **When to Plan and Construct Cantonment Sites**.

(1) Contingency Operations in War. On a doctrinal basis, during the planning and execution of general engineering missions in the theater of operations when the situation requires a sustainment of military forces, the mission of facility construction and repair will be tasked to engineer units. For example: During Operation Desert Shield, the construction of cantonment facilities and other base camp structures were given top priority for the sustainment of U.S. and Allied forces in the area of operations.

(2) Peacetime Contingency Operations. PCO's are usually politically sensitive military activities normally characterized by short-term, rapid projection or employment of forces in conditions short of war. Recent examples of cantonment missions are the housing of Haitian Refugees at Guantanamo Bay, Cuba which was tasked to 8th Engineer Support Battalion, and disaster relief operations conducted by the 15th Marine Expeditionary Unit after a hurricane hit Bangladesh. PCOs are often undertaken in crisis-avoidance or crisis-management situations requiring the use of military elements to enforce or support diplomatic initiatives. This distinguishes PCO's from contingency operations in war, which are often accomplished for purely military objectives. Cantonment missions may be tasked during the following PCO's:

(a) Disaster Relief.

(b) Non-combatant Evacuation Operations (NEOs).

(c) Show of Force.

(d) Peacekeeping Forces.

(On CS #15)

TRANSITION: We have just covered the definition, nature and capabilities of different units in Cantonment planning.

OPPORTUNITY FOR QUESTIONS:

1. **QUESTIONS FROM THE CLASS**: Do you have any questions? (Answer students' questions.)

2. **QUESTIONS TO THE CLASS**:

a. QUESTION: What is the capability of an MWSS unit in Cantonment planning/construction?

ANSWER: It's a primary task given to MWSS Engineers and they have a medium capability in performing that task.

b. QUESTION: When might we be called upon to build a cantonment?

ANSWER: Contingency Operations in War and Peacetime Contingency Operations.

TRANSITION: Now that we understand when a cantonment planning is necessary, let's look at who is responsible for doing what.

(ON SLIDE #16)

2. **RESPONSIBLE BILLETS. (20 MIN)** It takes many different people to plan for, construct, maintain and run a cantonment. The key players are listed below. Staff coordination will be needed throughout the planning process and execution of the cantonment mission.

a. **Engineer Officer (LSE) with the assistance of the Engineer chief or Platoon Sergeant.**

(1) Design and construction of facilities congruent to the Commander's intent.

(2) Ensure capabilities of the engineer element(s) can support the assigned mission.

b. **The Logistics Officer will be responsible for.**

(1) The movement of all gear and equipment.

(2) Contracting all Host Nation Support (HNS).

c. The **Supply Officer** (through the S-4/G-4) will be responsible for the procurement of all required supplies.

(ON SLIDE #17)

d. The **Camp Commandant** (often assigned as a collateral duty to the S-3 or other Marine) will:

(1) Establish the local security (Duty Officers etc.)

(2) Establish and enforce camp policies such as hours of operation and police of the area.

(3) Daily administration of the camp after it has been turned over from the Engineer Detachment.

(4) Will play a part in the planning of the cantonment.

e. The **Medical Officer** or **Independent Duty Corpsman** (IDC) will:

(1) Ensure that proper hygiene and sanitary conditions are maintained throughout the cantonment.

(2) Monitor water source(s) and hygiene facilities.

f. The **Security Force Commander** will establish and supervise the camp security plan with regards to the applicable threat levels or conditions.

(ON SLIDE #18)

TRANSITION: We now know the responsibilities of the different billets within the cantonment operation.

OPPORTUNITY FOR QUESTIONS:

1. **QUESTIONS FROM THE CLASS:** Do you have any questions? (Answer students' questions.)

2. **QUESTIONS TO THE CLASS:**

a. QUESTION: Who are the key players in the planning, construction and maintenance of a Cantonment?

ANSWER: Engineer Officer, Plt Sergeant, Logistics Officer, Supply Officer, Camp Commandant, Medical Officer/IDC, Security Force Commander.

b. QUESTION: What are the responsibilities of the Engineer Officer in Cantonment planning/construction?

ANSWER: He is responsible for the design and construction of facilities and also ensures the capabilities of the engineer elements can support the assigned mission.

TRANSITION: Now that we have identified key players and their responsibilities in Cantonment design, construction and maintenance, let's look at the Concept of Operations related to Cantonment.

(ON SLIDE #19)

3. **CONCEPT OF OPERATIONS. (30 MIN)**

a. **Pre-deployment Preparation**. Once the mission is received the Engineer detachment, along with other supporting sections, will begin their planning for a successful mission. The amount of time spent on these activities will depend on the urgency of the mission.

(1) Mission Analysis

(2) SLRP (site recon/site survey)

(3) Coordination

(ON SLIDE #20)

b. **Task Organize**. As the planning continues, the engineer detachment (with supporting attachments) and their equipment will be task organized to most effectively execute the mission. While doing this you should consider:

(1) Engineer assets (people and equipment)

(2) Priority of movement

(ON SLIDE #21)

c. **Deployment**.

(1) Air Echelon (initial occupation force)

(2) Landing Force Support Party (construction force)

d. **Construction**. As part of the mission analysis, it is important to understand the level of permanency expected as well as what other activities will be on-going in and around the camp during construction.

(ON SLIDE #22)

e. **Turn-over**. Once the main body has arrived and occupied the camp the day to day functions of the camp will be turned over to the Camp Commandant.

f. **Maintenance and operation**. While the main operation of the camp will give over to the Camp Commandant, certain

functions will remain with the engineer detachment such as maintaining the generators and production of water.

(ON SLIDE #23)

g. **Tear-Down And Retrograde**. Depending on the life span of the camp, the original units may or may not be the ones to execute the tear-down and retrograde. Regardless, plans should be made for the eventual tear-down and retrograde of the camp.

(ON SLIDE #24)

TRANSITION: We now know the Concept of Operations in planning, design, operation, maintenance of a Cantonment.

OPPORTUNITY FOR QUESTIONS:

1. **QUESTIONS FROM THE CLASS**: Do you have any questions? (Answer students' questions.)

2. **QUESTIONS TO THE CLASS**:

a. QUESTION: Name the activities involved in Pre-Deployment and preparation phase of the Cantonment Concept of Operations?

ANSWER: Mission Analysis, SLRP (site recon/site survey), Coordination.

b. QUESTION: Do the tasks of the Engineer Detachment stop upon turn-over of the Camp Commandant?

ANSWER: No. Essential Engineer Detachment tasks continue.

TRANSITION: Now that we have discussed Concept of Operations in Cantonment design, construction and maintenance, let's take a 10 minute break and then we will move on to the details of Planning in Cantonment.

(ON SLIDE #25)

(BREAK 10 Min)

TRANSITION: Before the break we covered Concept of Operations. Let's go ahead and discuss the details in the Planning of Cantonments.

(ON SLIDE #26)

4. **PLANNING. (120 MIN)** Cantonment planning is time-sensitive and mission driven. The planning and execution of a cantonment will be an iterative and cyclical process in that there are areas that will have to be readdressed and revised/updated as you move through the project. Preliminary planning will begin once a Mission is given. Warning orders will be given to subordinates to allow them to begin preparations.

(ON SLIDE #27)

a. **Engineer Point of View**. Focus should be on camp requirements. The following planning considerations should always be in the engineer chief's critical analysis:

(1) Commander's Intent

(2) Operational mission of the Base Camp Site

(3) Number of personnel operating in the camp

(4) Duration of operations.

(5) Identification of potential location for a base camp will always consider available resources:

(a) Existing transportation system

(b) Possible water resources

(ON SLIDE #28)

a. **Site Reconnaissance**: Many questions (From the METT-T analysis) will be answered during the Site Reconnaissance. Data concerning the activities and resources of a potential enemy as well as data about meteorological, hydrographic or geographic characteristics of a particular/future area of operations.

(1) The following establishes as products or deliverables of site reconnaissance:

(a) Host Nation support (S-4)

(b) Operational Liaison (S-2 / S-3)

(c) Main Body preparation (Personnel / Equipment)

(d) Verification of expected mission

(e) Security requirement (Limited security detachment)

(ON SLIDE #29)

(2) Fundamentals for the reconnaissance/site survey of a cantonment area include:

(a) Analyze reconnaissance/site survey objectives.

(b) Report information accurately.

(c) Avoid decisive engagements.

(d) Develop situation rapidly:

1 Deploy.

2 Reconnoiter.

3 Regress.

4 Debrief/Report.

(ON SLIDE #30)

b. **Site Reconnaissance Team**. The following is a list of suggested members of a site survey team. This list is not all inclusive, nor is it meant to be compulsory; the situation will dictate ultimately who can go and who must stay behind.

(1) Commanding Officer or Executive Officer of the unit occupying the cantonment. The Commander will have a very vested interest in where the camp will be. He will

want to ensure that the location selected will allow them to fulfill their missions and that their Marines are well taken care of.

(2) Construction Officer and/or Engineer Operations Chief. Much of the effort and equipment that will be expended on the construction and maintaining of the camp will come from the Engineer Detachment. It is imperative that the Engineer Officer/Chief verifies that the location for the camp is viable and that the scope of construction and infrastructure is supportable.

(3) Drafter/Surveyor (1361). A 1361's use of surveying and *AutoCAD* will be extremely useful while conducting the site survey to map out the area and then later in designing the camp layout itself.

(4) Engineer Equipment Chief when available and space permits. There will be potentially large amounts of earthwork such as leveling the area, creating/upgrading roads, and the use of materials handling equipment (MHE). The Engineer Equipment Chief has het knowledge and experience to quickly and accurately identify which gear is needed and how much of it you should bring.

(5) Utilities Representative(s). A cantonment is by nature very heavily utilities intensive. As such, a knowledgeable utilities officer or chief should be included in the site survey/reconnaissance.

(6) Fuel Representative. The Bulk Fueler can identify the needed space for the fuels equipment and can test the fuel supply when necessary.

(ON SLIDE #31)

c. There will be times when no one from the engineer element will be able to go on the site survey/recon. Other/alternate sources of information include (but not limited to):

(1) Aerial photographs and satellite imagery can be obtained through the S-2/G-2 and can provide detailed information that can be used to plan for a cantonment.

(2) The CIA World Fact Book is an invaluable source of detailed information about the country that you will be

operating in. The CIA World Fact Book is an online resource.

(3) The US State Department has published their Country and Area Studies on their web site. These studies can provide background information and help define the local disposition towards the US.

(4) Other units already operating in the Area of Operations or that have recently returned. This is not limited to military organizations. The following list a beginning for where you possibly turn to for information and assistance:

(a) Defense Attaché Office (attached to the Embassies)

(b) U.S. Agency for International Development

(c) Peace Corps

(d) Drug Enforcement Agency

(ON SLIDE #32)

d. **Preliminary Planning**. In order to plan effectively a thorough METT-T Analysis must be done. There are three elements when performing this analysis. They are: (1) List the facts, (2) State the significance of those facts, and (3) State the conclusion drawn from those facts.

(ON SLIDE #33)

(1) Mission. Establishes the tasks of a contingency force, both specified & implied. It also establishes the area of operations, the time available for deployment, and the duration. **REMEMBER THE 5 Ws!**

(a) What unit(s) will be using the cantonment?

(b) What is the purpose of the cantonment (i.e. displaced person camp, EPW camp, or HCA camp)?

(c) What is the Commander's Intent?

(d) When will we begin work and when will it be occupied?

(e) Where will the camp be located and where will vital life support functions come from.

(ON SLIDE #34)

(2) Enemy. The level of conflict will largely depend upon the entry conditions that the force entered with. U.S. forces must be prepared, immediately upon arrival, to conduct combat operations in the deployment area. Enemy forces could range from local guerillas and regional forces capable only of limited warfare, to larger well-equipped forces capable of conventional, and/or NBC warfare. Enemy capabilities will impact your construction as in that you may need to increase force protection and/or survivability positions.

(ON SLIDE #35)

(a) Permissive Entry. US Forces allowed in by the host nation (Kuwait). This type of entry will likely be the lowest threat level.

(b) Semi-permissive Entry. US Forces are allowed in by the Host Nation but are not universally accepted by the population (such as Haiti). In this environment a moderate threat level is to be expected ranging from personal attacks to civil disturbances.

(c) Forced Entry. Usually involves combat operations (Afghanistan, Iraq). The threat level is high.

(ON SLIDE #36)

(3) Terrain & Weather. Topography, climate, and habitation in potential areas of deployment shape engineer force composition. Possible environments of U.S. strategic concern having a significant impact upon military operations include mountains, jungles, deserts, winter in temperate zones and extreme northern regions, and urban terrain.

(a) Terrain will impact the cantonment execution in many ways such as the amount of work required and the accessibility of the location in relation the ports of entry.

(b) What modes of transportation are available?

(c) Terrain and weather combine to impact drainage.

(d) When analyzing the terrain do not overlook the human element:

1 What impacts will you and your operation have on the local populace?

2 What cultural obstacles are in your area of operations?

(e) Space: the larger the operating space the more time will be required to accomplish tasks such as refueling, delivery of supplies, and maintenance.

(ON SLIDE #37)

(4) Troops & Support Available. Depending on operational commitments, personnel, supplies and equipment assets are often limited or unavailable for a given operation. Take a close look to see whom and what will be dedicated to the mission.

(a) Analyze the T/O and T/E requirements and review the unit's capabilities supporting the operation.

(b) Identify shortfalls in personnel and/or equipment. Once the shortfalls are identified, mitigation must be determined. It may be possible to receive augmentation from other units within the MAGTF. If not, you will have to alter your plans to reflect your capabilities.

(ON SLIDE #38, 39)

(5) Logistics. In contingency operations engineer forces rely on strategic airlift for rapid deployment and resupply, however, engineer equipment and supplies are heavy and bulky for aircraft. In contingency planning, pre-positioned engineer items should be considered (i.e., MPF, deployed MAGTFs, and HNS). Sea-lift of oversized equipment, follow-on engineer units and construction materials may be necessary.

(ON SLIDE #40)

(d) Host Nation Support (HNS). It is the policy of the U.S. to use maximum HNS. Coordination and application of host nation agreements will be a major requirement in the planning of contingency operations. HNS will be vital after the 30 day self-sustaining requirement of the MAGTF and is often required earlier to conduct subsequent operations ashore. HNS may be furnished in the following areas:

1 Local Government Agency Support. In many countries, government agencies build, operate, and maintain large facilities. Included are:

a Railways.

b Waterways.

c Utilities.

d Radio and television broadcasting networks.

NOTE: BY AGREEMENT WITH THE HOST NATION, THESE AGENCIES PROVIDE THEIR SERVICES AND OPERATE THEIR SYSTEMS IN SUPPORT OF U.S. REQUIREMENTS.

2 Civilian Contractors. Contractor service may be host country, third party country, or U.S. contractor using host nation or third party personnel. Civilian contractors provide supplies and services such as transportation, labor, and construction.

3 Civilian Employees. Local populace can provide support to U.S. units and activities. Their skill levels range from low-skilled laborers to more highly-skilled equipment operators and mechanics.

4 Host Nation Military Units (Combined Force Operations). The host nation may provide military or paramilitary reserve units to support U.S. requirements.

a Military police.

b Motor Transport units.

c Maintenance units.

5 Supplies and Equipment. Supplies and equipment for missions may be more readily acquired locally than through the U.S. logistics system.

a Class III (Petroleum, Oils, and Lubricants {POL})

b Class IV (Construction materials).

c Class IX (Repair Parts).

6 Maps and Charts: Providing detailed local survey control, maps and terrain data sources as well as charts and drawings of underground access (sewers, utility chases, etc).

(ON SLIDE #41)

d. Once the METT-T is done (or nearly so) the planning process can continue. The process includes:

(1) Selecting a suitable site for the cantonment.

(2) Camp Requirements

(3) Developing a timeline through the use of *Project Management* techniques previously taught in the course.

(4) Developing a Bill of Materials.

(5) Site planning, or camp layout.

(6) Developing an engineer estimate of supportability as discussed during Engineer Planning.

(ON SLIDE #42)

TRANSITION: The planning process has begun. We understand the concept of operations.

OPPORTUNITY FOR QUESTIONS:

1. **QUESTIONS FROM THE CLASS**: Do you have any questions? (Answer students' questions.)

2. **QUESTIONS TO THE CLASS**:

a. QUESTION: What is the abbreviated acronym engineers use in preliminary planning?

ANSWER: METT-T

b. QUESTION: What are some examples of support we might receive from a Host Nation?

ANSWER: Transportation, facilities, Class IV, workers, etc.

TRANSITION: Before we move on, let's take a 10 minute break.

(ON SLIDE #43)

(BREAK 10 Min)

TRANSITION: We are into the planning process for a cantonment. We just talked about the various influencing factors that may impact your plan and cantonment. Are there any questions about anything we have covered to this point? Great! An essential part of the plan, and to the success of the mission, is the site selection.

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(ON SLIDE #44)

5. **SITE SELECTION: (60 MIN)** Entry conditions will dictate how the cantonment site is selected, if at all.

a. Site Selection will be required when:

(1) A US Governmental organization determines a need for a site without identifying an exact location. (I.e. FEMA or USAID for disaster relief.)

(2) The US Government makes an agreement with the Host Nation establishing contingency sites within the nation.

b. Site selection is typically not required when:

(1) HN designates, and US approves, a specific parcel of land for use.

(2) Specific strategic, operational, tactical, or technological requirements dictate a particular pre-designated location.

(ON SLIDE #45)

c. There will be many issues that will (or may) impact the selection of the cantonment site. Issues that should be identified during the METT-T analysis and preliminary planning process include, but not limited to:

(1) The military mission/political situation

(2) The expected duration

(3) The size and composition of the force.

a A larger force will not only require a larger footprint due the sheer numbers, but also because more support will be required.

b The composition of the force will dictate what support will be required.

(4) Level of hostilities.

(5) Status of Forces Agreement with Host Nation.

(6) Land use agreements.

(7) Soil, foundation, site drainage, flooding and seismic information.

(ON SLIDE #46)

(8) Water supply, sanitary sewage and waste disposal. When using local services it is important to remember that we want to have as little impact on the local community as possible. The following questions should be asked and answered concerning the water and sewage of the camp:

a Water. What is the available amount and what are the standards for the local water supply?

b Sanitary Sewage. How far away is the connection? Does the local system have capacity to handle the camps output?

(9) Electrical power availability. It may be possible to tap in to the local power grid to supply at least some of the power for the cantonment site.

(10) Environmental, cultural, social, and archeological conditions will need to be considered.

(11) Medical and health concerns and facilities.

(12) Local labor market. Depending on the size and scope of the mission, some civilian contract support may be required. This might be for construction, portable toilet support, etc.

(13) Existing facilities that are useable within the scope of the mission and force protection/anti-terrorist standards. Examples include:

a Buildings and hardstand.

b Airstrips/seaports

c Ground transportation

Note: While the site survey team will be identifying the feasibility of the pre-selected site or identifying possible locations, the final approval of the site will be reserved for the commander unless delegated to a subordinate.

(ON SLIDE #47)

TRANSITION: Site selection is very important in Cantonment planning. It can save the engineers work or make more work. It can also impact the ability of the camp to defend itself.

OPPORTUNITY FOR QUESTIONS:

1. **QUESTIONS FROM THE CLASS**: Do you have any questions? (Answer students' questions.)

2. **QUESTIONS TO THE CLASS**:

a. QUESTION: What are some of the factors that may impact the decision about site selection?

ANSWER: Mission/political, size and composition of the force, duration, existing facilities, etc.

b. QUESTION: What are some examples to consider when setting up cantonment in a Host Nation?

ANSWER: Environmental, Cultural, medical/health concerns, local labor, etc.

TRANSITION: We've discussed site selection criteria and some of the influencing factors that may impact your choice. Let's take a 10 minute break.

(ON SLIDE #48)

(BREAK 10 Min)

INTERIM TRANSITION: Once we have the location determined, we can then begin determining the requirements that will have to be satisfied in order to support the camp.

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(ON SLIDE #49)

6. **REQUIREMENTS. (120 Min)** The requirements will be dictated by the mission of the units for which the cantonment is being built. Support functions cannot be overlooked in the identification of camp requirements. The first step in identifying requirements is to identify what existing assets are at the cantonment location.

a. An inventory of existing facilities, to include any infrastructure, should be done as soon as possible after the site selection/approval has been made. It may be more

useful to use existing facilities for purposes other than what they were originally designed for.

b. Determine the number of personnel and equipment that will be supported. This can be done using the occupying units' TO/TEs or obtained through the respective S-3s.

(ON SLIDE #50)

(1) COCs. Each element will need individual COCs.

(a) Depending on the situation and need for the cantonment, security may be needed to control access to the COCs.

(b) By their very nature, COCs will be large consumers of electrical power. 24 hour power will be a necessity.

(2) Staff and Administrative Areas.

(a) *Tent #1 Administrative:* Located next to the COC or in Rear Areas of Operations.

1 Personnel Officer (CAC).

2 S-1 Adjutant.

(b) *Tent #2 Intelligence/Operations:* Located next to the COC or in the COC.

1 S-2 Intelligence Officer.

2 S-3 Operations Officer.

(c) *Tent #3 Logistics:* Located next to the COC or in the COC. Should provide working space for:

1 S-4 Logistics Officer.

2 Maintenance Management Officer.

3 Ordnance Officer.

4 Supply Officer.

(d) Unit supply/storage areas may be with the COCs or in other operational areas of the camp depending on the unit's needs.

(e) There should be adequate parking near the COCs for unit vehicle parking for those conducting business.

(ON SLIDE #51)

(3) Communications Area.

(a) Remote antennas away from the camp.

(b) Protection of communication wires in base camp.

1 Bury.

2 Overhead.

3 Clearly marked.

4 50ft safety zones around high-voltage areas.

(ON SLIDE #52)

(4) Water will often be the most challenging part of cantonment planning due to the logistical issues that come along with producing water.

(a) The quantity required will be based on the number of personnel the camp supports.

1 20 gallons per day per Marine is the rule of thumb. This includes water for consumption, messing and hygiene.

2 Water used for vehicle washdown (for maintenance or redeployment) is not included in this amount. Nor is water that may be used for dust abatement. In either case, the water used does not have to be potable but should be free of pollutants.

(b) Potable water can be produced using equipment that is organic to the Engineer units such as the Tactical Water Production System. The equipment needed for this task will be discussed in the Utilities class.

(c) Ideally, the water point will be either in the encampment or in very near proximity. Being in a separate location will necessitate having to effectively set up and run two camps or at least greatly affect the logistical operations of the units.

(d) Water storage should be located near high volume users when possible to more easily facilitate the supply mechanism. Conversely, the potable water storage point should be located away from any waste discharge or storage areas. Other thoughts about water storage and distribution:

1 Maintenance lanes should be built into the site set up to move and access equipment.

2 Berm all storage bags within storage area.

3 Use generators in pairs.

4 Avoid running water lines over heavily trafficked routes. When it is necessary to run a water line across any roadway, be sure to protect water lines from traffic.

5 Effects of extreme temperatures on equipment?

6 Much like the fuel farm, you will need to build in vehicle entrances and exits for ease of refilling.

7 Refilling of distribution points and water bulls?

(ON SLIDE #53)

(e) One method of tracking production and usage is the "water table."

DAY	PRESONNEL ON HAND	REQUIRED (GALS)	STORED	DELIVERED FROM HNS	PRODUCED	NOTES
1	300	6000	0	8000	0	ADV PARTY ARRIVES
2	300	6000	2000	8000	20000	WATER POINT ESTABLISHED
3	450	7500	22000	8000	20000	MESSING BEGINS SERVING A-RATS
4	1100	25000	47000	8000	20000	MAIN BODY ARRIVES, SHOWER HOURS BEGIN
5	1100	25000	50000	0	20000	HNS HOLIDAY
6	1100	30000	45000	8000	20000	SCHEDULED VEHICLE WASH-DOWN

(ON SLIDE #54)

(5) Sewage disposal of some kind is a must for what comes in must come out. Head facilities can be built on site using a number of different methods and should be 120' from billeting and 300' from the messing facility.

(ON SLIDE #55)

(a) Burn-out Heads. Commonly called "4-holers," Burn-out heads are wood frame structures that use 55 gallon drums cut in half as the waste receptacle. The drums are gathered on a regular basis, transported downwind and the waste is incinerated. This does require having extra receptacles that can replace the full ones while burning. The barrels are primed with 3" of diesel fuel to allow the solid waste to become well soaked to enhance the complete thermal destruction of the waste matter. The fuel also acts as an insect repellant. You will need one four-hole burnout head for every 50 Marines in the encampment. Separate heads will need to be constructed for males/females.

(b) Pit Heads are akin to the "out house." The four-hole head structure will be built over a pit that has been dug 2 feet wide, 7.5 feet long and a maximum of 6 feet

deep. When soil conditions do not support digging deep pits, *Mound Heads* can be built by constructing a mound to the desired height, digging a trench and supporting the trench with revetment. A four-hole head would then be built over the trench. You will need one four-hole facility for every 50 Marines in the encampment. Separate heads will need to be constructed for males/females.

(c) Chemical Toilets *(porta-potties)* have become very prevalent. There is no construction time and the clean-out is contracted to local contractors. While this does lessen the work load for engineers initially and helps to eliminate the need for menial working parties to ensure the safe operation of the camp, the local contractors can pose a security concern in certain areas of operation. Depending on placement and cleanout schedule you will need approximately one chemical toilet for every 20 Marines.

(ON SLIDE #56)

(d) Urine Soakage Pits should be utilized when using burnout heads to help reduce the amount of liquid waste which has a debilitating effect on the thermal destruction process. Urine pits can also lessen the load in portable heads allowing for longer durations between cleanouts. Urine soakage pits will be dug 4 feet square and four feet deep. The pit will be filled to within 6 inched from the top with rubble, bricks, rocks or debris. Ventilation pipes are inserted to within 6 inches of the bottom of the pit and extend 6 to 12 inches above the ground level. Six urinal tubes are placed approximately 8 inches below ground level and extend approximately 26 inches above the ground. Screened funnels are attached to the pipes. Oil soaked burlap or tar paper is spread over the fill and covered with 6 inches of soil.

(ON SLIDE #57)

(6) Hygiene facilities.

(a) Showers and Laundry units. While the specific equipment will be covered during the Utilities class, the following points should be considered:

1 Adequate drainage must be provided.

2 The facilities will be 120 feet from billeting and 300 feet from messing.

3 Changing areas will be needed for the shower units.

4 Different hours will be set for Male/Female shower times.

5 Wash racks may be utilized instead of laundry units for short term deployments.

(ON SLIDE #58)

(b) Hygiene stations (for shaving and brushing teeth) should be located around the billeting area but not immediately adjacent to the main water distribution points.

1 These may be as simple as wooden tables or troughs or more permanent structures combined with the heads/showers depending on length of deployment.

2 Ensure there is proper drainage.

(c) Hand washing stations should be located in the vicinity of the heads, the dining facility, and the medical facilities.

(d) Soakage and/or evaporation pits will be needed for laundry units, shower units, and the chaw hall. The chow hall will most likely need grease traps as well.

(e) Showers and Laundry units should be located near the main water storage area but at least 120’ away from billeting and 300’ from the messing facility.

(ON SLIDE #59)

(7) Power/Electrical Point(s). Today we take for granted how much electricity we consume. Our society has shifted into the technology age with no going back. This technology requires a great deal of power to keep it running. The operation environment will have an impact on power consumption as well and must be considered.

(ON SLIDE #60, 61)

(a) Consolidate generators whenever the tactical situation permits.

1 Offers safety.

2 Provides ease of security.

3 Provides control over equipment.

4 Ease of maintenance.

(b) Provide protection to power lines.

1 Bury electrical wires.

2 Consolidate electrical wires in trenches before burying.

3 Mark location of buried electrical wires with marking stakes.

(c) Clearance for overhead wires should be at least 18 ft over roadways.

(ON SLIDE #62, 63)

(d) Tap into local power when the situation permits. Ensure that the power supplied is suitable and that you have personnel that are capable of doing this safely.

(e) Safety.

1 Ensure HNS electricity runs the same voltage as you.

2 Inspect for unauthorized taps into powerlines.

3 Inspect for overloaded circuits.

4 Don't leave hot wires exposed to weather elements.

5 Provide a 50 ft. security perimeter around high-voltage areas and generators.

(ON SLIDE #64, 65)

(8) Fuel Farm/Point. The fuel itself is considered a Class III supply item. The equipment and manpower used to store and distribute the fuel fall under the engineers.

(a) The fuel farm/fuel point should be away from billeting areas and downhill from cantonment site.

(b) Berm and separate storage bags.

(c) The 1391s (Bulk Fuelers) are trained to fight fuel fires and are equipped to handle most situations when the need arises.

(d) To avoid contamination, the fuel farm should be located away from water sources and water storage areas.

(e) Distribution is one of the main reasons for having the fuel farm in the camp.

1 Entrance and exits for ease of refilling storage containers and vehicles.

2 Distribution points: Located in close proximity to high usage equipment.

3 Pump or gravity fed? While gravity feeding may work reasonably well for refilling the generators and/or a small number of customers, you will find that it is easier and faster to refuel a larger number of vehicles using pumps to enhance the flow volume.

(f) The Marine Corps is responsible for our own fuel from high water mark inland.

(ON SLIDE #66, 67)

(9) Dining Facility. Depending on length of deployment, the chow hall may serve one, two, or more hot meals each day. While this will not be the Engineer's decision, it is important to coordinate with the Mess Officer to ensure that the chow hall meets his needs to support the unit(s). Considerations for the chow hall:

(a) Located in central part of camp to allow ease of access for all patrons.

(b) Separate chow hours for each unit may be beneficial. There will be exceptions of course especially considering certain units may be doing shift work.

(c) Consolidated or separate chow facilities? While it often makes sense to consolidate all of the cooks, mess men, and equipment into one location, there will be times when this is not practical or even possible.

(d) A covered mess tent keeps unwanted seasoning out of the food.

(e) Pest control measures must be considered to control vermin and insects. HNS, traps, and poisons are some of the methods that can be used.

(f) Hand washing areas outside the entrances.

(g) As a means of economy of effort, the Mess tent should be a multi-purpose facility. One structure can easily serve multiple functions such as:

1 Mess area.

2 Chapel for religious services.

3 Movie/recreational area.

4 Meeting/briefing area.

5 Location for informational bulletin boards.

6 Exchange complex.

(ON SLIDE #68)

(h) Dining facilities generate a lot of waste.

1 Garbage pits: 4' X 4' X 4' pit per 100 men per day.

2 Paper/wood (combustibles): Burn barrels or incline incinerators. Designate pits outside base camp perimeter.

3 Wet waste (food wastes) may be sold to farmers as animal feed.

(10) Hazardous Waste.

(a) POL: Collection, storage, and removal.

(b) Batteries: Collection, storage, and removal.

(ON SLIDE #69)

(11) Billeting Areas. GP tents, strong backs, sea huts, containers (known as "cans"), or existing structures may be used as housing for the units.

(a) Normally 12 men per tent for planning factors.

(b) Spacing: At a minimum, billeting structures will be separated 12 ft side to side and 30ft end to end.

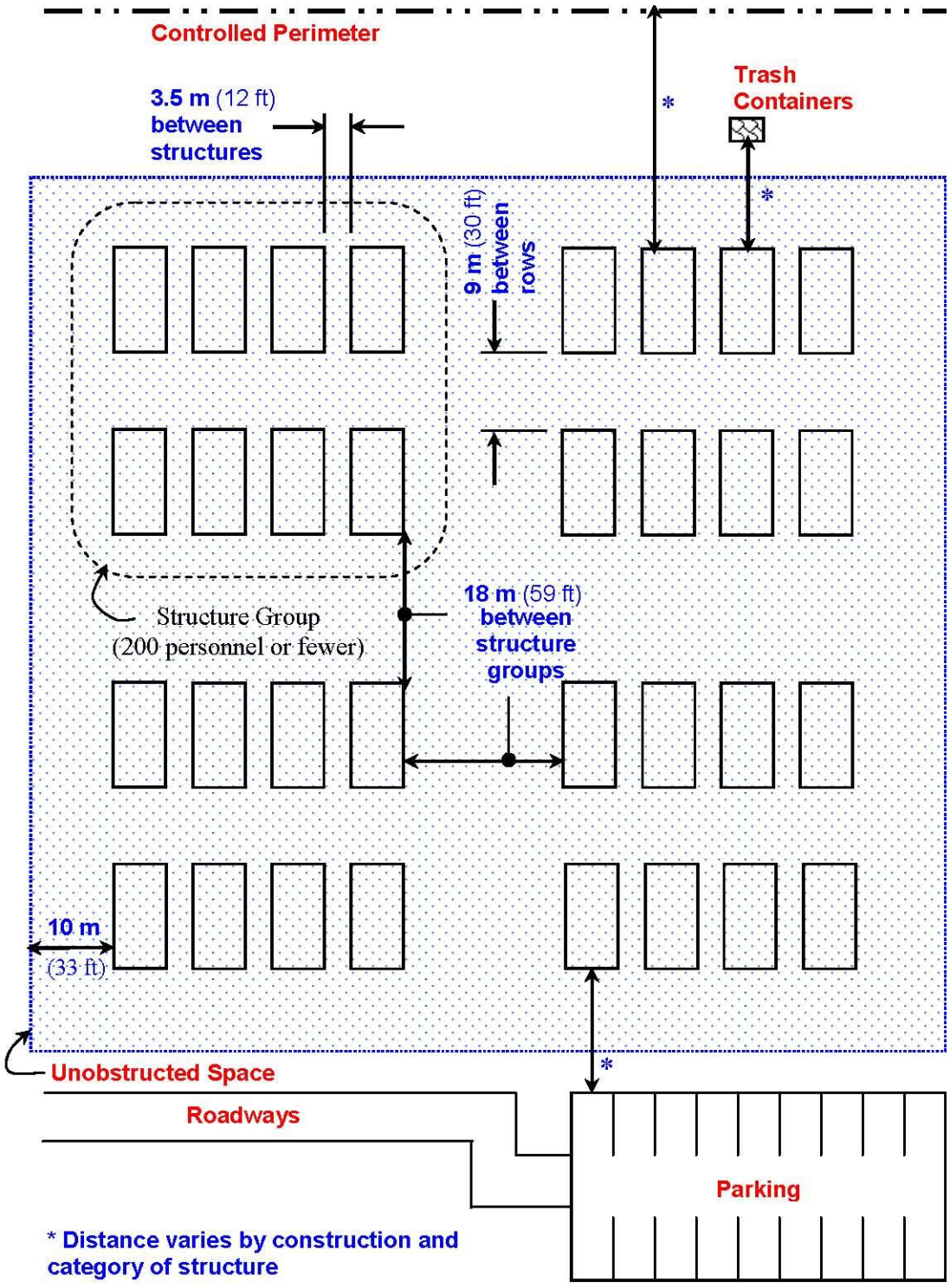
(c) Tents/SEA Huts should be grouped together in structure groups of no more than 200 personnel per group. There should be a minimum of 18 meters (59 feet) between groups.

(d) Fire lanes and fire extinguishers.

(e) Separate units and services.

(f) Separate by demographics. Depending on the mission of the cantonment you may be separating the population based on sex, age, family, religion or MSC.

(ON SLIDE #70-72)



(ON SLIDE #73)

(12) Motor Transport and Equipment lots.

(a) Maintenance bays/tents away from main roadway.

(b) Maintenance bays/tents away from dusty conditions.

(c) Built on flat area.

(d) M.T. and equipment parks should be located away from away from main camp area to reduce the noise in the COCs and billeting areas.

(ON SLIDE #74)

(e) There may be a need for billeting located within MT and engineer equipment areas for duty personnel. This is not intended for permanent housing of Motor-T and Engineer Marines.

(f) Simple loading ramps can be constructed to ease the loading and offloading of heavy equipment.

(ON SLIDE #75)

(13) Maintenance areas should be located in close proximity to the units they service. Maintenance facilities are usually consolidated.

(ON SLIDE #76)

(14) Ammunition Supply Point (ASP).

(a) 1250ft from billeting and operational areas.

(b) Provide security posts, perimeter fencing and security lighting (dependent on tactical situation).

(c) Separate ammunition by different classes and DODIC's (Department of Defense Identification Codes).

(d) Berm all ammunition bunkers.

(e) Located in dry, flat, open area.

(f) Ease of access in and out.

(g) Space for loading/unloading and operation of heavy equipment.

(ON SLIDE #77)

(15) Supply Lots/Storage lots.

(a) Located away from billeting and administrative areas.

(b) Security fence and security lighting (dependent on tactical situation).

(c) Located in dry, flat, open area.

(d) Ease of access in and out.

(e) Space for loading/unloading and operation of heavy equipment.

(ON SLIDE #78)

(16) Aid Stations.

(a) Centrally located within the camp.

(b) Corpsman billeting area next to BAS.

(c) Bed spaces for patients in separate tent than from surgical/examination tent.

(d) Constructed as a strongback or better.

(e) Partitions within to allow for confidentiality.

(ON SLIDE #79)

(17) Landing Zone.

(a) Downwind from the cantonment area.

(b) Away from burn pits/areas.

(c) Constructed to comply with type of aircraft expected to be utilized.

(d) If refueling missions are expected, ensure you have a *Helicopter refueling System* or other means of distributing aviation grade fuel.

(ON SLIDE #80)

TRANSITION: These areas we have just covered are the more common areas that you may be expected to plan for within a cantonment.

OPPORTUNITY FOR QUESTIONS:

1. **QUESTIONS FROM THE CLASS**: Do you have any questions? (Answer students' questions.)

2. **QUESTIONS TO THE CLASS**:

a. QUESTION: What are some of the important distances that we need to keep in mind as we do our planning?

ANSWER: Standoff distances for the Heads and hygiene areas (120' from billeting and 300' messing), Tent spacing (12' side to side and 30' end to end).

b. QUESTION: Name some of the administrative staff that belongs in a COC?

ANSWER: Personnel Officer (CAC), S-1 Adjutant; S-2 Intelligence Officer, S-3 Operations Officer; S-4 Logistics Officer, Maintenance Management Officer, Ordnance Officer, Supply Officer.

TRANSITION: Before we move on, let's take a 10 minute break.

(ON SLIDE #81)

(BREAK 10 Min)

TRANSITION: There are potentially many different users within a cantonment. These users have different requirements with their own restrictions that must be satisfied. Let's look at some additional considerations that will mold the cantonment layout.

_____
_____
_____
_____
_____
_____

(ON SLIDE #82)

7. **GENERAL SITE PLANNING. (60 MIN)** Site planning should begin as soon you receive the mission. It will go through some changes as the process proceeds.

a. The purpose of site planning is to:

(1) To enhance the accomplishment of the mission. Graphically displaying the areas will ensure that enough area is allocated for each unit without placing them too close together.

(2) To ensure that tactical security and Anti-Terrorism/Force Protection (AT/FP) are considered early in the planning process.

(3) To provide environmental protection and enhancement.

(4) To promote quality of life for the residents of a base camp.

(ON SLIDE #83)

b. During the development of the site plan it is important to remember the following parameters:

(1) Functionality. Do operational areas conflict? Is there adequate space and accessibility for deliveries and dispersals?

(2) Maintainability. Is the road network maintainable? Is the drainage adequate?

(3) Environmental soundness. Has the sanitation and hazmat concerns been addressed?

(4) Aesthetics. It should look strong while not making the security positions evident.

(ON SLIDE #84)

c. Site planning considerations:

(1) AT/FP. The operational environment will dictate certain aspects of AT/FP. Some basic stand-off distances include:

(a) 10 meters between buildings.

(b) 10 meters clear space between structures and parking areas (within a controlled perimeter.

(c) 45 meters stand-off for primary gathering facilities (any structure that will hold more than 45 people).

(2) Site Access. Special considerations should be given to the Entry Control Points (ECP) during the initial phases of the site planning.

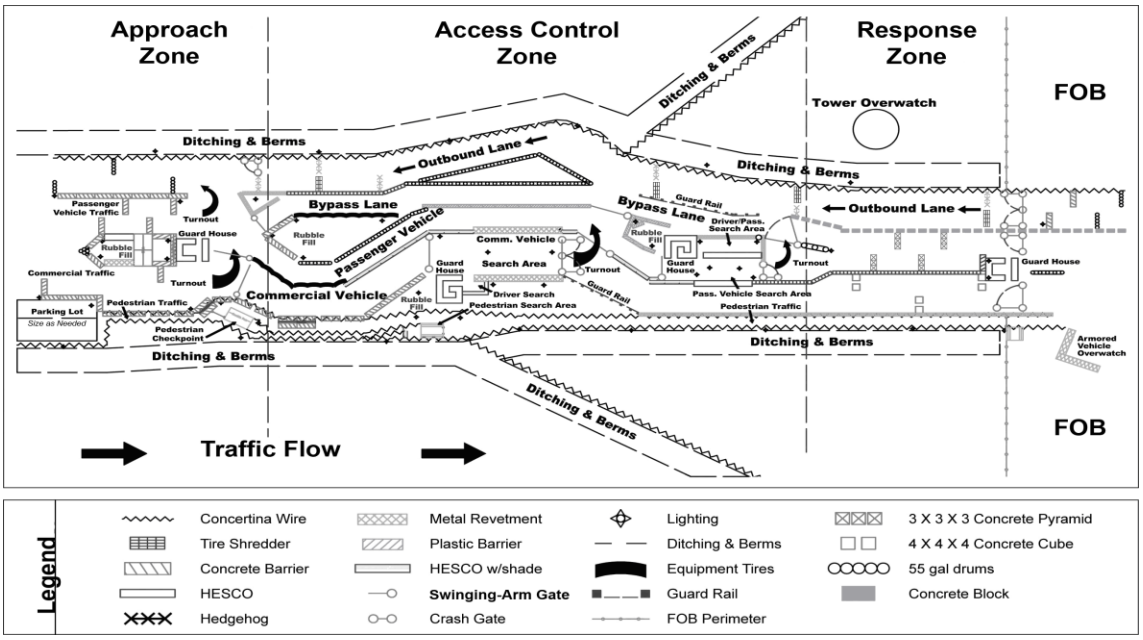
(a) There should always be at least two access points for the base camp. These two access points should not be on the same side of the cantonment.

(b) Plan for special access for tactical convoys and oversized vehicles. This could be through a gate designed and built for this purpose or having barricades or obstacles in the main entrance that can be moved to allow passage for the larger vehicles.

(c) Consider having a parking area outside of the cantonment with a gate/portal for HN workers to enter on foot.

(d) The ECP should have provisions for vehicle inspections and turnouts for vehicles that need to be rerouted.

(ON SLIDE #85)



(ON SLIDE #86)

(3) General Considerations. There are several general factors that must be considered as you design your site plan.

(a) Prevailing winds are important in the layout of the cantonment for several reasons.

1 Landing Zones should be located so that their approach and departures (base on the wind) will have a minimal effect on the cantonment area.

2 Burn pits (either for solid waste or human waste) should be located downwind of the base camp.

3 Heads should be positioned so that the winds do not carry the odors through the camp.

4 When there are consistently strong prevailing winds wind breaks may be necessary to prevent damage to tentage and to minimize dust.

(b) Drainage should always be one of the primary considerations.

1 Care should be taken when filling HESCO containers so as not to create pits or low lying areas inside of the cantonment area.

2 Consider routing evaporation pits outside of the base camp when possible.

3 Evaluate the effects of season precipitation changes. Will this have an impact of accessibility of the cantonment?

(c) Functionality/proximity.

1 Groups operational areas such as maintenance and Motor-t/Equipment parks together when possible. Likewise, the Showers and laundry units should be near the bulk water storage and have room for the evaporation pits. The chow hall cannot be within 300 feet of the showers/laundry but may have a large water demand.

2 As mentioned above, some areas can not be in close proximity. Water and fuel should be stored separately. Operational areas such as Motor-T or engineer equipment lots should not be located in close proximity to billeting or the COCs due to the noise and potential for dust.

(d) Expandability. You should allocate space to allow for a growth in forces. This may require temporary billeting areas for units that are being relieved in place.

(ON SLIDE #87)

TRANSITION: Just as site selection is important to the overall plan, site layout will have a huge impact on the overall operation of the cantonment.

OPPORTUNITY FOR QUESTIONS:

1. **QUESTIONS FROM THE CLASS:** Do you have any questions? (Answer students' questions.)

2. **QUESTIONS TO THE CLASS:**

a. QUESTION: Name two considerations that will impact the Site Plan for your cantonment site.

ANSWER: AT/FP, Drainage, prevailing winds, functionality/proximity, expandability.

TRANSITION: Before we move on, let's take a 10 minute break.

(ON SLIDE #88)

(BREAK 10 Min)

TRANSITION: The engineer's job is seldom over once the cantonment is built. Engineers will be required to maintain equipment and keep various commodities within the camp operational.

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_____
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_____

(ON SLIDE #89)

8. **OPERATION AND MAINTENANCE. (15 min)** Just as with building the cantonment, it takes a coordinated effort to run and maintain the camp. The Engineers will likely not be responsible for all areas of operations and maintenance but much of the gear, such as generators, belongs to engineers and must be maintained.

a. Generators must receive regular PMs and refueling.

b. Water production will be a continuous operation and is an engineer function. The water purification equipment needs maintained. The water needs monitored (by medical) to ensure it is adequate.

c. Units living in and using the Cantonment will need to have their vehicles refueled.

INTERIM TRANSITION: Are there any question for me before we move on the Camp Closure and Cleanup?

(ON SLIDE #90)

9. **CAMP CLOSURE AND CLEANUP. (15 MIN)** Agreements are usually made prior to the entry of troops concerning how much will have to be torn down and to what degree will the camp be reclaimed.

a. Class IV materials may be left for use by HNs.

b. Hazardous materials will be removed and areas cleared in compliance with US standards or the Host Nation standards, whichever is more stringent.

c. Larger end items (such as generators) will be retrograded with the owning units or disposed of through the supply system if purchased or obtained specifically for the deployment.

d. The terrain will be returned as nearly as possible to the original state and in accordance with any pre-existing agreements.

(ON SLIDE #91-93)

INSTRUCTORS NOTE

Use the following two slides and previous basecamp layouts to provide examples of good and bad basecamp layouts. Allow students to take breaks as required.

(ON SLIDE #94)

INTERIM TRANSITION: Do you have any questions before we move on to your practical application portion?

PRACTICAL APPLICATION: (19 hours) This practical application will take 19 hours to complete. Students will be broken up into teams in preparation for cantonment brief with time designated by the instructor when briefs will occur.

PRACTICE: Teams will receive a map, scenario package and necessary materials to make briefing packages and media for briefs. The primary instructor will act as HNS, S-1 through S-6 as point of contact for entire exercise.

PROVIDE-HELP: Assist students in the production of a Cantonment Layout and Briefing Packet. Answer all student RFIs.

1. Safety Brief: N/A

2. Supervision and Guidance: The Primary Instructor will provide all necessary equipment needed for the completion of cantonment briefs.

During student planning, the primary instructor will provide guidance for all logistical needs and RFIs present by the students.

3. Debrief: Will be conducted by students during performance phase briefings IAW the training schedule.

(ON SLIDE #95)

TRANSITION: You have just spent a lot of practical application time for your Basecamp Planning Brief.

OPPORTUNITY FOR QUESTIONS:

1. **QUESTIONS FROM THE CLASS:** Do you have any questions? (Answer students' questions.)

2. **QUESTIONS TO THE CLASS:**

a. QUESTION: Name an important consideration that you need to remember when closing/cleaning a basecamp?

ANSWER: Return the site as close to its original state.

b. QUESTION: What is an important and continuous task during operation and maintenance of a basecamp?

ANSWER: Water production and purification.

(ON SLIDE #96)

SUMMARY: **(5 MIN)**

Regardless of where in the world we go or why we go there, there will be a need for cantonment. Today we have discussed the reasons why we may be called upon to build a cantonment, the planning process, required areas, site selection, site layout, and the camp closure processes. Are there any questions?

_____

_____

_____

(BREAK 10 Min)

References:

TITLE	PUBLICATION ID
Combined Arms Countermobility Operations	MCWP 3-17.5
Engineer Field Data	MCRP 3-17A
Engineer Operations	MCWP 3-17
Military Operations on Urbanized Terrain (MOUT)	MCWP 3-35.3
Survivability	MCWP 3-17.6