SITE SELECTION AND RECONNAISSANCE

CHAPTER 2

This chapter outlines the location, layout, and design of military roads and airfields. The first steps in constructing a road or airfield are determining the best location for the facility and formulating the essential areas and construction features. Throughout the preconstruction phase, problems can *be avoided by a well-planned site selection.*

LOCATION FACTORS

Construction of a road or airfield initially consists of providing a prepared subgrade and base course according to design criteria. Airfield runways require more transverse areas than roads. Although the governing criteria and dimensions for roads and airfields differ, the basic approach to their location and layout is the same. Engineers should use the factors listed below to locate and lay out all construction projects.

MISSION

The most important factor in selecting a site is to ensure it will fulfill mission requirements. Lines of communication (LOC) must be build to accomplish a specific mission in the most direct and efficient manner possible. All location factors must be evaluated to support the mission.

EXISTING FACILITIES

Use all existing facilities. The wartime missions of engineer troops arc so extensive and the demand for their services so great that new construction should be avoided. Extensive roadnets of varying quality and capacity already exist in most areas of the world, Where possible, use these roadnets to the fullest extent. In many cases, expansion and rehabilitation of existing facilities is adequate for mission accomplishment.

Except in highly developed areas, existing airfields are seldom adequate to handle modern, high-performance aircraft. However, with minimum rehabilitation these airfields can usually be made adequate to accommodate them. They may serve as the nucleus for larger fields that meet the requirements of high-performance aircraft. Helicopters and light planes can often operate from existing roads, pastures, or athletic fields.

LOCATION AND DESIGN

To the greatest extent possible, the location and design for a facility must provide the best response to all requirements. Alternative road and airfield plans can be evaluated, from the standpoint of total earthwork and drainage structure requirements, to reduce construction effort.

Try to construct airfields in an area that will serve existing and future requirements. Consider the future needs of military units

and facilities, such as depots and hospitals, when locating roads. Soil type and incumbent pavement structure requirements, rock formations, and vegetation should also be considered in locating roads. A given road segment to be constructed or improved should be considered in view of its contribution to the overall network. Similarly, an airfield should be evaluated for its ability to enhance an arifield network.

SOIL CHARACTERISTICS

Locate all roads and airfields on terrain having the best possible subgrade soil conditions. This will decrease construction effort and result in a better facility. The subgrade should be compacted under conditions allowing it to support the design loads. Conduct a basic soils investigation prior to construction to provide data needed to ensure good construction decisions. Refer to FM 5-410 for soils information and FM 5-530 for soil survey procedures.

DRAINAGE

Locate roads in areas that are easily drained and where drainage structures are minimized. Drainage is a more critical factor in locating airfields than roads. Because of the wide areas involved in airfield installations, water must be diverted completely around the field or long drainage structures that are difficult to maintain must be constructed. This topic is further discussed in Chapter 6 of this manual.

Avoid the low points of valleys or other depressed areas because they are focal points for water collection. Many airfields are constructed across long, gentle slopes because of the relative ease of diverting water around the finished installation. Avoid construction on unprotected floodplains and alluvial fans, if possible, due to the flood hazard. Alluvial terraces are often ideal locations for air fields. They offer flat expanses that are above the river floodplain and are normally protected from flooding.

Avoid constructing facilities in areas of high water tables. Although it is possible to construct subsurface structures that will remove part of this moisture, maintaining routes through these areas presents a continual problem. If it is impossible to avoid constructing a road or airfield in this type of terrain, the water tables must be lowered during construction to reduce the adverse effect of water on the strength of the supporting subgrade and base course.

GEOLOGY

Before locating any lines of communication, carefully analyze the geology of the area. Sizeable quantities of rock anywhere along a construction project will cause a large removal problem, slow construction, and increase the construction effort. Engineer troop units require special equipment and training to excavate rock.

Rock outcropping are more common in hilly terrain than in flat or rolling country. In areas where the preliminary design indicates that cutting is required to reach final grade, take enough borings to determine the location of the rock.

identify the type of rock material for evaluation as a suitable construction aggregate. Determine the structural orientation of the rock mass to properly design road cuts and ensure rock-slope stability. In sedimentary rocks it is best to align road cuts perpendicular to the strike. If this is not possible, use the safe-slope ratios shown in Figure 2-1.

TOPOGRAPHY

Construct all roads and airfields within maximum grade specifications. The specifications depend upon the facility's construction standard. Thus, avoid excessive grades and steep hills when locating these routes. If steep hills must be negotiated, the route should run along the side of the hill rather than going directly over it. This may result in a longer route, but it is generally more economical and avoids excessive grades.

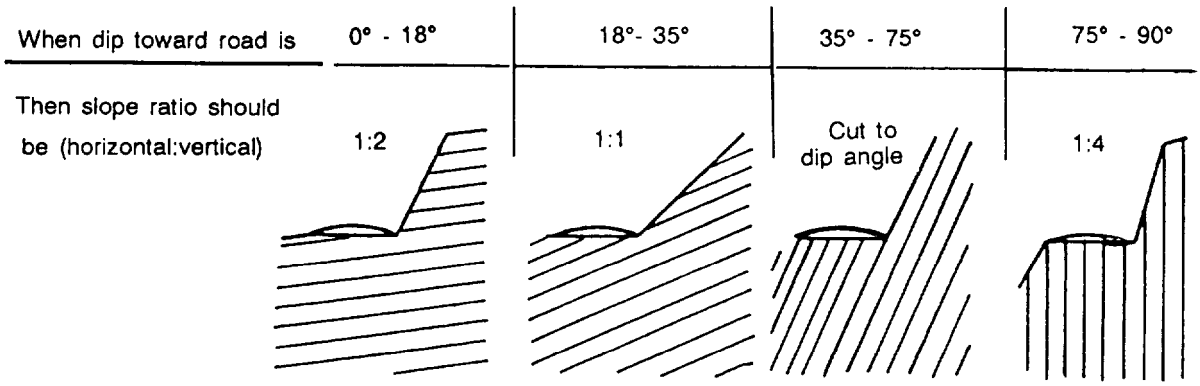

Figure 2-1. Safe-slope ratio

EARTHWORK

The largest single work item during construction of LOC is earthwork operations. Any step that simplifies earthwork operations will decrease required work and increase job efficiency. Generally, when cutting and filling on a project, earth handling is reduced by using the material excavated to construct required embankments. This balancing must be within the haul capabilities of the available equipment. Even though earthwork should be balanced throughout a project, if the haul distance becomes excessive, it may be more practical to open a nearby borrow pit or establish spoil areas. Balancing cannot be done where the excavated material is not acceptable for usc in an embankment.

ALIGNMENT

Keep the number of curves and grades at a minimum for efficient traffic flow over roads. All vehiceles have difficulty in negotiating sharp curves; even gentle curves decrease traffic capacity. Lay all routes with minimum curves by making the tangent lines as long as possible. Locating long tangents is influenced primarily by the terrain and limited by the following principles of efficient location: minimizing earthwork, avoiding excessive grades, and obtaining suitable fill material. Align runways in the direction of the prevailing wind because aircraft usually land and take off into the wind.

OBSTACLE CROSSINGS

Whenever a route crosses a major obstacle, such as a river, a ravine, or a canal, bridges or other structures arc required. Construction is time-consuming and requires materials that may be in short supply. Avoid these obstacles whenever possible. It will be advantageous to forego many of the other location principles to decrease the number of obstacle crossings. Use existing structures to decrease total work requirements, This may require only the strengthening of an existing bridge or no bridging work at all. When possible, the road should not cross a particular obstacle more than once.

BRIDGE APPROACHES

When locating rou tes, carefully evaluate construction requirements for approaches to obstacles. Construction of approaches over marshes or floodplain areas can cause greater requirements than the obstacle crossing itself. Approach conditions may be the prime factor in obstacle crossing and

may dictate route location. Consider the approach with the obstacle when establishing the optimum route.

GROUND COVER

All routes should avoid heavily wooded areas that require extensive clearing, lf this is not possible, the route should pass through areas having the least vegetation. Precede all earthwork by stripping unsuitable material.

REQUIRED AREAS

Airfields need large areas of relatively flat land to efficiently accomplish their mission. This usually restricts the number of sites that can be considered for airfield construction. Advance location and layout will avoid cramping necessary facilities. Frequently, the airfield must be spread over a large section to obtain the required area. This results in the construction of a complex network of taxiways and service roads. When this is the case, keep in mind the ability to construct this connecting network to appropriate specifications.

Roads built on rolling or flat terrain seldom require large, lateral areas. Roads constructed in deep cuts or fills require proportionately greater lateral areas to account for slopes.

ACCESSIBILITY TO MATERIALS AND UTILITIES

The efficient operation of airfields requires the use of electricity, water, gas, and sewer systems. Locating new airfields near existing utility systems can avoid the construction of new facilities or long transmission lines. A nearby railhead will help the construction effort.

Consider the quality and availability of construction materials when locating a facility. Obtain suitable base-course materials from existing pits and quarries whenever possible because much planning and effort are required to open a new quarry. The quality and available quantity of materials must meet the construction requirements. The proximity of a suitable base-course-material source is a critical planning factor.

MARGINAL MATERIAL

When planning the location of a project, consider using marginal materials nearby. Using marginal materials for subbase and base construction and, as an aggregate in pavements is sometimes possible by using geotextiles, mechanical stabilization, or admixtures. Often the use of marginal material is unavoidable. Where possible, poor -quality material should be excavated and replaced with more suitable material, or the project should be relocated.

FLIGHT-WAY OBSTRUCTIONS

The safe operation of fixed- or rotary-wing aircraft requires the removal of all obstacles above lines specified by design criteria. These criteria depend upon the operating characteristics of the aircraft to be serviced. For example, most heliports require an approach zone with a 10:1 glide angle (8:1 for short-duration operations), whereas heavy-cargo aircraft in the rear area require a glide angle as flat as 50:1. To achieve this glide angle, it is often necessary to remove vegetation and hills and perform extensive earthwork operations far from the airfield proper. Thus, avoid locations that require extensive work to achieve the necessary glide angle.

A similar clearance is required on the sides of runways. An area of specified width must be cleared of all obstacles and graded according to specifications.

SUNLIT SLOPES

lf tactical concealment is not required, locate roads on the sunny, exposed sides of valleys or hills, particularly in wet or cold areas. This permits the road surface and subgrade to dry rapidly, minimizes icy conditions, and makes maintenance easier. Prevailing winds should also be considered

when locating roads. Prevailing winds will carry snow, rain, and sand onto the road - way, if the orientation of the road is undesirable. Protective snow or sand fences should be oriented to take into account the prevailing winds.

TACTICAL CONSIDERATIONS

Frequently, it is necessary to construct temporary roads or heliports or to improve landing strips to move personnel and materials. When this is the case, consider the following tactical factors:

Defilade. Locate all roads in a defilade position on the reverse side of a hill or ravine to avoid enemy observation and to provide cover from direct artillery or mortar fire.

Camouflage. When constructing a road or airfield in an exposed area, take advantage of all natural camouflage and concealment.

Defense. Air fields in forward areas are prime targets for enemy air and ground attacks. When designing the airfield, disperse the facilities to minimize the effects of bombing or strafing attacks. It may be necessary to use ground troops in defensive positions against enemy ground action.

FUTURE EXPANSION

Due to the unpredictability of military operations, engineer troops are often required to modify and expand previously completed construction. The road that is adequate for today's maneuvers may be inadequate for tomorrow's operations. Airfields built for small aircraft with a limited evacuation mission may have to be modified to meet more stringent design criteria for accommodation of high-performance aircraft, Improvement and expansion are a continuing job on all military construction.

Try not to construct a road or airfield in a restricted area where there is no possibility of expansion. Design basic facilities so that they can be used as part of the expanded facilities. The ability to expand an existing route or facility will conserve personnel and material and permit rapid completion of future projects.

RECONNAISSANCE

Reconnaissance operations vary with the operational environment; the assigned mission: and the size, type, and composition of the reconnaissance element. An aerial, map, or ground reconnaissance is necessary to determine the best existing or best possible location for a future road or airfield.

MISSION

The primary mission of a reconnaissance party is to find a site meeting most requirements, to recommend a general layout and construction plan, to estimate the work required to construct the facility, and to obtain the data needed to determine a completion date and detailed construction sched - ules. When the reconnaissance mission is complete, the reconnaissance report serves as the basis for tactical plans and construction schedules.

The final construction plans and schedules are made with regard to the tactical and logistical situation and the construction time available. The reconnaissance report, submitted by personnel conducting the investigation, must be complete, comprehensive, and sufficiently detailed to permit careful analysis,

RECONNAISSANCE-PARTY CAPABILITIES

Thorough reconnaissance requires qualified, trained, and experienced personnel. The quality of the reconnaissance is directly related to the abilities of the party accomplishing it. This is especially true in airfield reconnaissance, which requires broader engineering judgment than any other engineer reconnaissance, Even a qualified civil

engineer with civilian or military experience requires special training for this activity. It is unusual for one person to be proficient in all the items a thorough reconnaissance must include. Therefore, the assignment of personnel to the party must provide for its overall efficiency as a unit. The party must be selected with regard to the conditions it may confront.

Factors to be considered include the road - net, the general nature of the terrain, the weather, the prevalence of land mines, the attitude of the civilian population, and the amount of enemy resistance the party may expect. These factors also influence the equipment assigned to the party. The equipment should include all items necessary for soil and topographic surveys, mobility, security, and good communication. The success of the mission depends on proper personnel and equipment. One without the other will not accomplish the needed results, If available, a soils or terrain analyst is a valuable member of the reconnaissance party, If an analyst is not available, obtain soil samples for later analysis.

STEPS IN RECONNAISSANCE

Reconnaissance involves the steps that follow.

Planning

Planning is concerned with the formation of a reconnaissance mission. It involves the coordination of reconnaissance efforts by appropriate headquarters, the estimation of needs, and the assignment of a reconnaissance mission. Both ground and aerial methods should be integrated. This is a responsibility of the engineer brigade, the group, or the battalion, not the individual reconnaissance party. Reconnaissance missions are based on user requirements as governed by ground forces. Maintain close liaison with all headquarters to achieve proper coordination, Improper coordination results in duplication of effort in some areas and inadequate reconnaissance in other areas.

Briefing

The briefing tells the reconnaissance party exactly which site or area is to be reconnoitered, what is already known about the area or site, and what information the party is expected to obtain, Details concerning the time or methods of reporting the information will be included in the briefing. The party must also know the type of facility for which it is reconnoitering. If a site has been tentatively selected or if some information has already been determined from a preliminary study, the party must be informed. Otherwise, time and effort will be wasted. A soils or terrain analyst should brief the reconnaissance party, if such an expert is not able to accompany the party, If available, aerial photos should be used in the briefing.

The following information is necessary for a full understanding of a particular reconnaissance mission and should be covered in the briefing:

- The general area to be covered, if an area reconnaissance is to be conducted; or the exact location of the site or facility to be investigated, if a specific reconnaissance is to be done.
- The nature of the proposed facility; the types of vehicles or aircraft scheduled to use it; the length of time such use is anticipated; and the minimum requirements concerning dimensions, grades, and clearances. (These items are covered by reference to the applicable standard layout and specifications published by the joint force commander in the theater. They are usually familiar to the reconnaissance officer but should be kept for reference.)
- The anticipated vehicle traffic and number of aircraft and personnel to be initially accommodated at the proposed facility. (When dealing with airfields, figures are often given in terms of the number and type of aviation units to be assigned to the installation. Strength and equipment figures should also be available for reference.)

- The minimum amount of aircraft service, repair facilities, and special requirements needed.
- The expected future expansion of the new facility.
- Ž The expected construction time available for building support facilities.
- Ž Information previously obtained about the proposed project.
- The essential details concerning the report and how, when, and to whom the report should be made,

When the reconnaissance party is to be away from its parent unit for a lengthy, continued reconnaissance, the following additional instructions must be covered in the briefing:

- The location where rations, clothing, and equipment replacements can be drawn.
- Ž The source from which petroleum, oils, and lubricants (POL) supplies can be drawn.
- Ž The service facility where vehicle maintenance can be obtained.
- The form of communications to be arranged; for example, radio, messenger, or telephone.

When ground reconnaissance is ordered ahead of forward ground-force elements, the following additional instructions are necessary:

- Ž Friendly-force situation.
- Known enemy-force situation,
- Location of adjacent friendly units.

The following instructions are applicable only to parties engaged in air reconnaissance:

- Alternative and emergency-landing instructions.
- Location of available aviation petroleum supplies.
- Location of the forward flying line.

Preliminary Study

The preliminary study consists of studying the information obtained during the briefing, conducting a map reconnaissance of the area involved, studying aerial photos, delineating soil boundaries, assembling other available preliminary information, and planning and preparing for the actual reconnaissance.

Sources of information that may be useful in the preliminary planning of reconnaissance missions and in the preliminary study of a specific mission are discussed below. Such information must be verified by ground reconnaissance.

- Intelligence dossiers that provide planning data and other information on a particular airfield site or route that may already exist. These dossiers are the result of previous reconnaissance or reconnaissance plans and can usually be obtained if adequate coordination is maintained with higher headquarters and other units engaged in reconnaissance. Similarly, reports of aerial reconnaissance that were conducted in anticipation of later ground reconnaissance may be available from adjacent or higher units.
- Strategic and technical reports, studies, and summaries on specific areas of actual or potential military importance are prepared by the Office of the Chief of Engineers and subordinate agencies. These reports provide the best data available at the time they were printed. Topographic, geologic, and soil maps, as well as data on the climate and groundwater tables, are usually included. These reports may contain information on water supply, construction

materials, vegetation, and special physical phenomena.

Ž Army and Air Force periodic intelligence reports are important, reliable sources of information. Intelligence reports are usually prepared in the interior zone, but periodic intelligence reports are field-prepared reports of all-around force elements. They include facts learned by prisoner-of-war interrogations, tactical data, reports, records, and interrogation of local inhabitants. Intelligence reports are used to prepare strategic and technical reports.

• Road, topographic, soil, vegetation, and geologic maps published by friendly or enemy govern ments and agencies are sources of information. Maps showing the suitability of terrain for various military purposes may be of considerable value in planning roads and airfields.

Ž Aerial photographs show the approximate amount of grading and excavation required, the total area and extent of promising sites, the extent of necessary clearing, the presence of flying hazards (for airfields), and the area and local drainage conditions.

Ž If time and facilities are available, topographic maps should be prepared from aerial photographs.

Ž Weather reports published by governmental agencies and the Air Force Air Weather Service are used to determine critical factors for runoff determination, prevailing winds, and cloud cover which will affect construction and future operations.

Ž Aeronautical reports and charts provide an overview to help plan aerial reconnaissance.

Ž Indigenous governmental agencies may provide valuable information on a great diversity of subjects.

Air Reconnaissance

Air reconnaissance involves a general study of the topography, drainage, and vegetation of the area. The construction problems, camouflage possibilities, and access routes should be visualized. Usually the specific ground-reconnaissance procedure is planned by selecting, from the air, areas that need investigating and by determining what questions need answering. Air reconnaissance can provide valuable negative information by eliminating unsuitable sites, but it cannot be solely relied on for positive information.

Ground Reconnaissance

While air reconnaissance can effectively reduce the amount of ground reconnaissance, it cannot replace ground reconnaissance. It is on the ground that most questions are answered or that questions tentatively answered from the air are verified. Often ground and air reconnaissance are not separate missions, A continuing air reconnaissance may be interspersed with specific ground reconnaissance.

REPORTING

The reconnaissance party must always submit its report on time. Reports are submitted for all sites investigated, even if the reconnaissance party considers the site unsuitable.

Full details on the method, place, and time of submitting reconnaissance reports should be included in the instructions given to the reconnaissance party. Reconnaissance reports can be submitted in writing or by radio. A radio report should be followed by a detailed written report. Standard reconnaissance reports are preferred. They ensure full coverage of needed information and allow a comparative evaluation of two or more sites. Standard formats are helpful in comparing sites which have been reconnoitered by different parties. They simplify each party's work in preparing reports.

Military roads and road networks are defined according to location and use. They are classified according to width, surface, and obstructions. Terms and formulas approved by the member nations of the NATO, the Southeast Asia Treaty Organization (SEATO), the United States, the United Kingdom, the Canadian and Australian Armies Nonmaterial Standardization Program, and other treaty nations are covered in FM 5-36.

Abbreviations, symbols, and notations used in route reconnaissance (described in FM 5-36) may also be used in airfield reconnaissance. Information given in road reconnaissance reports is useful in reporting on access roads to airfield and heliport sites.

AIR RECONNAISSANCE

An air-reconnaissance team generally consists of only two members: the pilot and the engineer observer. Having the officer in charge of the ground-reconnaissance party act as the engineer observer is advantageous and should be arranged when possible. Time is saved and errors of omission are minimized when a report from the engineer observer to the officer in charge of the ground-reconnaissance party is not necessary except as a matter of record, The pilot can also assess the site and make the appropriate recommendations.

Two -place, fixed -wing aircraft or two-place helicopters are suitable for most air-reconnaissance missions, Reconnaissance of enemy-occupied airfields is best accomplished with modified tactical aircraft.

Effective air reconnaissance should provide the following information:

- Determination of terrain features.
- Ž Description of obstacles.
- Evaluation of LOC.
- Ž Assessment of suitability of the area for various types of construction.
- Identification of available sources of water.
- Supply evaluation of construction materials in the area of operations.
- Discussion of cover and concealment.

GROUND RECONNAISSANCE

The composition of the ground-reconnaissance party depends on the scope and extent of the mission and the nature of the terrain it must traverse. The composition depends upon the probability of contact with the enemy, the attitude of the civilian population, and the prevalence of mines in the area to be reconnoitered. Table 2-1, page 2-10, provides a list of personnel suitable for an airfield reconnaissance. The list can be modified to meet the particular needs of the situation.

All personnel involved should be trained in ground reconnaissance. It is important that the person in charge and the assistant be well versed in all aspects of reconnaissance.

All equipment needed to carry out the assigned tasks should be taken. The equipment varies as the composition of the party varies. A typical list of equipment suitable for the party is listed in Table 2-2, page 2-10.

Map and air studies are not substitutes for ground reconnaissance; they only reduce the amount of ground effort required. Ground reconnaissance should determine the following information:

- Estimated grades to be encountered.
- Estimated amount of clearing involved. This includes trees, tree stumps, and boulders. Sometimes objects such as buildings and concrete foundations are included.
- Ž Consideration of debris generated during clearing operations. In some

Table 2-1. Typical airfield ground-reconnaissance party

	Grade	Primary Duty	Secondary Duty
1	Officer	Command Party	General reconnaissance
2	Sr NCO	Second in command	
3	EM	Technical Engineer	Machine gunner
4	EM	Plane-table man	Machine gunner
5	EM	Terrain intelligence analyst	Rodman
6	EM	Airphoto interpreter	Soils analyst
7	EM	Driver/RTO	Assistant machine gunner
8	EM	Driver/RTO	Wheel-vehicle mechanic

Table 2-2. Suggested equipment list for airfield ground-reconnaissance party

Item	Quantity	Item	Quantity
Truck, 1 1/4 ton	2	Clinometer	1
*Carrier, personnel, armored	2	Panel marking sets	2
Machine gun, 7.62 mm	2	Pioneer tools	1 set/vehicle
Pedestal, 7.62 mm machine gun mounted	2	Towing chain	2
Binocular, 7 x 50	2	Material for marking, fording, and swimming sites	As required
Goggles, sun, plastic	6	Improvised means of measuring water depths	1
Radiacmeter, IM-93/UD	1	Measuring tape	2
Radiacmeter, IM-174/PD	2	Three-man pneumatic reconnaissance boat	1
Detector kit, chemical agent, AN-M256	1	Vehicular first-aid kit	2
Paper, chemical agent detector, M8	1 book	FM 5-34	1
MOPP gear	As required	Reconnaissance report forms and formats	As required
Radio set, mounted in truck	1	Adequate map and aerial photo coverage	As required
Flashlight	4	Tracing tape (tape, textile)	As required
Camera (Polaroid) with film	1	Lensatic compass	2

*Desirable when operating in support of mechanized forces or in northern areas.

cases, the trees removed may be used in the construction operation. Details of clearing operations are discussed in Chapter 4 of this manual.

- Nature of soil encountered, field determination of gradation, percentage of fine-gradient materials, and plasticity characteristics.
- Conditions of streams at crossing sites; width, depth, and velocity of the stream; condition of the banks and streambed; and indications of high water levels.
- Presence or absence of local construction materials, including possible sources of sand, gravel, cement, tar, asphalt culvert pipe, and lumber, Local con - struction capabilities and labor conditions are included.
- Estimated amount of earthwork necessary, the approximate balance between cut and fill, and the necessity for long hauls of earth material.
- Errors or discrepancies on the maps from which the site was tentatively selected and the effects of such errors on the selection.
- Local rainfall data and other pertinent information about seasons and weather obtained through local inhabitants or other sources,
- Information or observations which affect the final facility location.
- Relationship with the local population.

ROUTE AND ROAD RECONNAISSANCE

Thorough reconnaissance is essential in the selection of roads. It starts with a study of available maps and aerial photographs. Aerial reconnaissance provides valuable information. Detailed information, however, can be obtained only by ground reconnaissance. Reconnaissance performed in connection with military LOC is route reconnaissance. Reconnaissance to check existing roads is road reconnaissance. Reconnaissance to determine the location for a new road is location reconnaissance.

A deliberate route reconnaissance is detailed. It provides the data necessary for a thorough analysis and classification of significant features along a route, including repair or demolition procedures, if required, An overlay is used to point out exact map locations, and enclosures are attached to the overlay. The enclosures are DA Reconnaissance Report forms that provide a permanent record and ensure enough detail is recorded, The use of these forms is explained in FM 5-36.

ROUTE RECONNAISSANCE

Route reconnaissance includes gathering information about roads, bridges, tunnels, fords, waterways, and natural terrain features that may affect the movement of troops, equipment, and supplies in military operations. Route reconnaissance may be hasty or deliberate. A hasty route recon - naissance is conducted to determine the immediate trafficability of a specified route and is limited to critical terrain data. It may be adequately recorded on a map overlay or sketch and be supplemented by reports about various aspects of the terrain,

ROAD RECONNAISSANCE

Road reconnaissance is conducted to determine the traffic capabilities of existing roads and to provide more detailed information than is needed for route classification. It may include enough information to develop work estimates for improving the road to certain standards of trafficability DA Form 1248, shown in Figure 2-2, pages 2-12 and 2-13, is used to record this information. Maps, overlays, and sketches are used as necessary.

ROAD RECONNAISSANCE REPORT
For use of this form, see FM 5-36; proponent agency is TRADOC

DATE: 29 AUG 88

TO (Headquarters ordering reconnaissance): COR. ATTN: S-2, 21ST ENGR. BN.

FROM (Name, grade and unit of officer or NCO making reconnaissance): D. MOONEY, SFC, CO. A, 21ST ENGR. BN.

1. MAPS	a. COUNTRY	b. SCALE	c. SHEET NUMBER OF MAPS	2. DATE/TIME GROUP (Of signature)
	FT. LEONARD WOOD SPECIAL	1:50,000	AMS V733 SHEET 5561 IV	29 1430 AUG 84

SECTION I — GENERAL ROAD INFORMATION

3. ROAD GRID REFERENCE		4. ROAD MARKING (Civilian or Military number of road)	5. LENGTH OF ROAD (Miles or kilometers, specify)
FROM	TO		
UT 122864	UT 097999	VIRGINIA ROUTE 617	16 KM.

6. WIDTH OF ROADWAY (Feet or meters, specify)	8. WEATHER DURING RECONNAISSANCE (Include last rainfall, if known)
6.7m to 9.3 m	FAIR - TEMP 79°
7. RECONNAISSANCE	LAST RAIN FALL - 15 AUG 88
DATE: 29 AUG 88 / TIME: 0615	

SECTION II — DETAILED ROAD INFORMATION (When circumstances permit more detailed information will be shown in an overlay or on the mileage chart on the reverse side of this form. Standard symbols will be used.)

9. ALINEMENT (Check one ONLY)		10. DRAINAGE (Check one ONLY)	
	(1) FLAT GRADIENTS AND EASY CURVES		(1) ADEQUATE DITCHES, CROWN/CAMBER WITH ADEQUATE CULVERTS IN GOOD CONDITION
	(2) STEEP GRADIENTS (Excess of 7 in 100)		
	(3) SHARP CURVES (Radius less than 100 ft (30m))	✓	(2) INADEQUATE DITCHES, CROWN/CAMBER OR CULVERTS, ITS CULVERTS OR DITCHES ARE BLOCKED OR OTHERWISE IN POOR CONDITION
✓	(4) STEEP GRADIENTS AND SHARP CURVES		

11. FOUNDATION (Check one ONLY)			
✓	(1) STABILIZED COMPACT MATERIAL OF GOOD QUALITY		(2) UNSTABLE, LOOSE OR EASILY DISPLACED MATERIAL

12. SURFACE DESCRIPTION (Complete items 12a and b)

a. THE SURFACE IS (Check one ONLY)			
✓	(1) FREE OF POTHOLES, BUMPS, OR RUTS LIKELY TO REDUCE CONVOY SPEED		(2) BUMPY, RUTTED OR POTHOLED TO AN EXTENT LIKELY TO REDUCE CONVOY SPEED

b. TYPE OF SURFACE (Check one ONLY)			
	(1) CONCRETE		(6) WATERBOUND MACADAM
	(2) BITUMINOUS (Specify type where known):		(7) GRAVEL
✓	ASPHALT		(8) LIGHTLY METALLED
	(3) BRICK (Pave)		(9) NATURAL OR STABILIZED SOIL, SAND CLAY, SHELL, CINDERS, DISINTEGRATED GRANITE, OR OTHER SELECTED MATERIAL
	(4) STONE (Pave)		(10) OTHER (Describe):
	(5) CRUSHED ROCK OR CORAL		

SECTION III — OBSTRUCTIONS (List in the columns below particulars of the following obstructions which affect the traffic capacity of a road. If information of any factor cannot be ascertained, insert "NOT KNOWN")
(a) Overhead obstructions, less than 14 feet or 4.25 meters, such as tunnels, bridges, overhead wires and overhanging buildings.
(b) Reductions in road widths which limit the traffic capacity, such as narrow bridges, archways, and buildings.
(c) Excessive gradients (Above 7 in 100)
(d) Curves less than 100 feet (30 meters) in radius
(e) Fords

SERIAL NUMBER a	PARTICULARS b	GRID REFERENCE c	REMARKS d
	STEEP GRADE - 8%	UT 119872	200m LONG
	SHARP CURVE	UT 112877	RADIUS 21m
	CONSTRICTION	UT 112878	6.7m WIDE, 300m LONG.
	CONSTRICTION	UT 105896	7m WIDE, 100m LONG.

DA FORM 1248, 1 JUL 60 — PREVIOUS EDITION IS OBSOLETE

Figure 2-2. Sample Road Reconnaissance Report, DA Form 1248

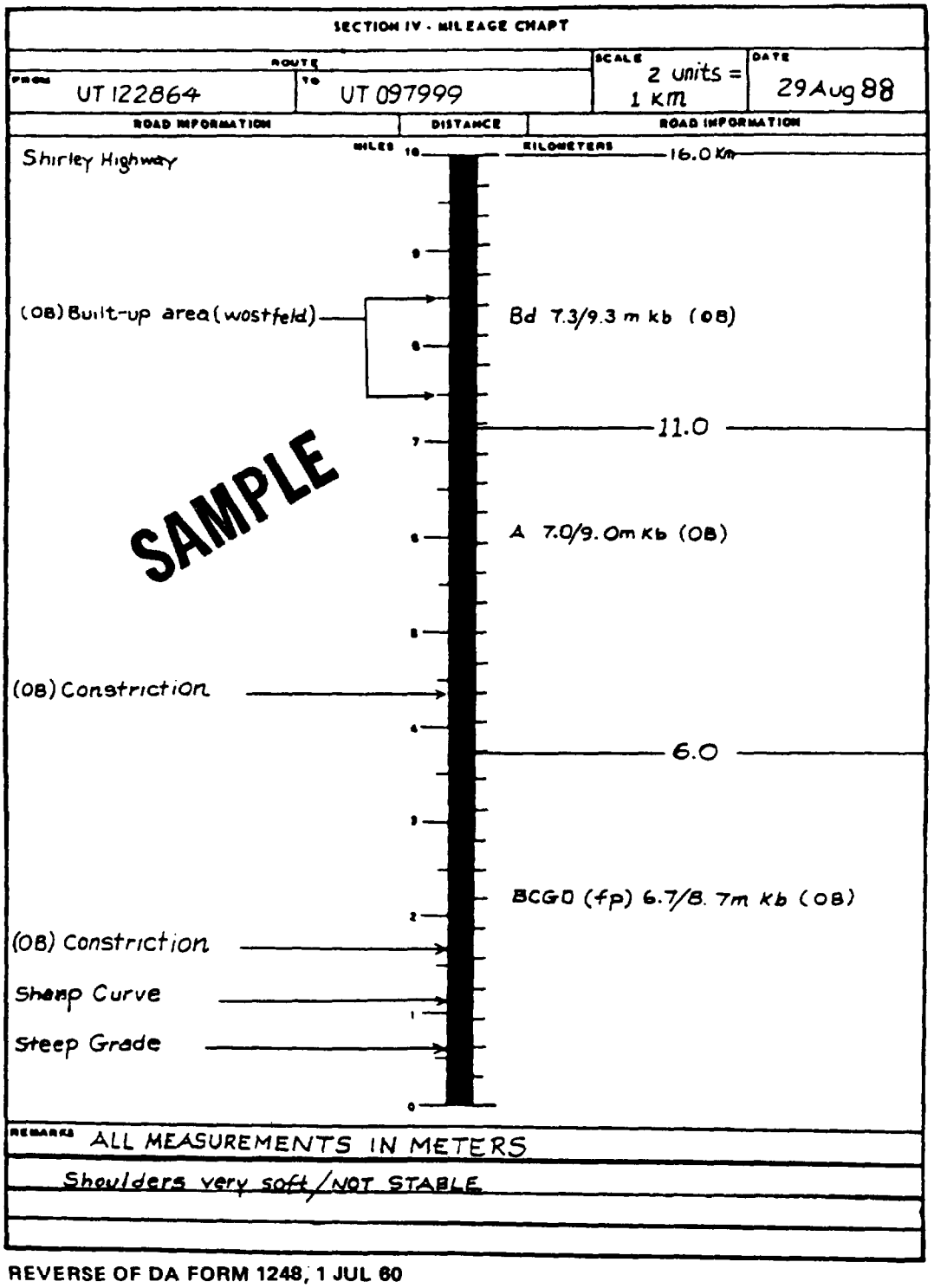

Figure 2-2. Sample Road Reconnaissance Report, DA Form 1248 (continued)

The most important factor in planning military roads is making maximum use of the existing roadnet. Subject to the requirements of the tactical plan, the existing roadnet must be adapted to military use before undertaking new construction. Existing roads should be surveyed at the earliest opportunity to determine their condition and capacity. Time is saved by improving an existing road rather than constructing a new one.

Periodic road reconnaissance is conducted to obtain information about the road situation in a specific area. A situation map is prepared and kept current to show the condition of roads, the density of traffic, the need for maintenance work, and the results of maintenance. Periodic reconnaissance is important during wet or unusually dry weather to determine the effects of these conditions. Maintenance requirements based on periodic reconnaissance must be coordinated with the agencies using the roads to ensure proper standards of maintenance and to avoid work on roads no longer needed.

LOCATION RECONNAISSANCE

When a new road is necessary, the first step is the location reconnaissance. This requires reconnaissance of all possible routes to ensure selection of the best route. The main objective of a location reconnaissance is to locate a new road that will withstand anticipated traffic and provide the best possible operating conditions.

ENGINEER RECONNAISSANCE

Engineer reconnaissance is often conducted in conjunction with deliberate route reconnaissance to determine route conditions (including work estimates) and to locate construction materials to improve or maintain the route. It is either a general or special reconnaissance. General engineering reconnaissance gathers engineering information of a broad nature within the operational area to locate and evaluate construction materials, resources, terrain features, and facilities that have engineer implications. Special engineer reconnaissance obtains detailed information regarding an investigation of a specific site or evaluates the potential use of an undeveloped facility such as an airport or heliport. DA Form 1711-R is a required enclosure to the route reconnaissance, as specified in FM 5-36.

AIRFIELD RECONNAISSANCE

Airfield reconnaissance differs from road-location reconnaissance, described in FM 5-36, in the scope of information. An airfield project involves more personnel, machine-hours, and material than a road project. Air traffic imposes more severe limitations on its traffic facilities than vehicular traffic. Consequently, the site selected must be the best site available.

PLANNING AIRFIELD RECONNAISSANCE

Tentative airfield sites are selected within enemy territory using map and aerial photograph reconnaissance, supplementing data from reports of aerial observers or intelligence sources. These sites may be undeveloped potential sites or operating enemy installations. Reconnaissance should begin as soon as possible.

For an undeveloped potential site, the object of the reconnaissance is to verify or amend tentative selections and layouts and to estimate the material, equipment, and troop requirements for the construction planned. If it is a captured enemy airfield,

a decision is needed on whether to use the captured field or develop a completely new site. Estimates of the engineering effort necessary to restore the airfield may also be required.

New airfields added to an area in which our aircraft are already operating can be developed in the following manner:

- Select the best available map of the area in which the new airfields are to be located. Draw a 5-mile-diameter circle around existing airfields and shade them. Note all high-tension, electric transmission lines and shade a 2-mile-wide strip centered on these lines. Locate and shade all similar obstructions on the map. Assault or hasty airfield selection is discussed in Chapter 10 of FM 5-430-00-2/Air Force Pamphlet (AFPAM) 32-8013, Vol 2.
- Confine the study for potential airfields to the unshaded parts of the map. Look for sites of sufficient area, preferably flat with good natural drainage, unobstructed air approaches, and accessibility to routes of communication. Assign the most likely sites to reconnaissance parties for appropriate air and ground investigation.

SELECTING RUNWAY LOCATION

A convenient way of selecting a runway location at a site that meets glide-angle requirements is to prepare and use the ah-field-siting template illustrated in Figure 2-3, page 2-16. This template can be drawn on acetate or heavy cellophane for use on any map to meet specifications for flight way, horizontal approach, and glide angle. When placed on the map, the template shows land forms and natural or manufactured obstacles that are in or above the plane of the glide angle.

In Figure 2-3, any hill within the approach zone at a distance of 8,000 feet from the end of the overrun and having an elevation of more than 160 feet above that of the end of the proposed runway, is in a 50:1 glide angle. This runway location is unsuitable according to the specifications. The template is useful to the reconnaissance officer and to the preliminary planning group. Prepared templates can measure distances in feet, yards, miles, and kilometers by placing gradations along their edges.

PROCEDURES FOR AIRFIELD AIR RECONNAISSANCE

The general procedure for an air reconnaissance follows:

En route to a particular site or a general area, the engineer notes open borrow pits, large stockpiles of construction material, rail and road accesses to the site, and errors on maps that have been studied. The pilot plays an important role on the reconnaissance team. Besides chauffeuring the engineer officer, the pilot considers approaches, mental hazards, and physical obstructions related to tactical aircraft that may use the proposed installation. A pilot who is familiar with operational requirements and the performance characteristics of tactical aircraft is more valuable than one who is not.

The engineer observer assesses possible construction problems at a potential site. The engineer selects tentative sites and directs questions to the ground reconnaissance party. The engineer receives the pilot's suggestions concerning the flying-related characteristics of the sites investigated and modifies estimates according to these recommendations.

To be effective as an engineer observer the officer should possess the following qualifications:

- Knowledge of road and airfield requirements and construction procedures and experience in airfield work.
- Immunity to airsickness. An airsick officer cannot effectively accomplish air reconnaissance. Any tendency of the engineer observer to become airsick is greatly enhanced by the continual concentration on a particular site and by

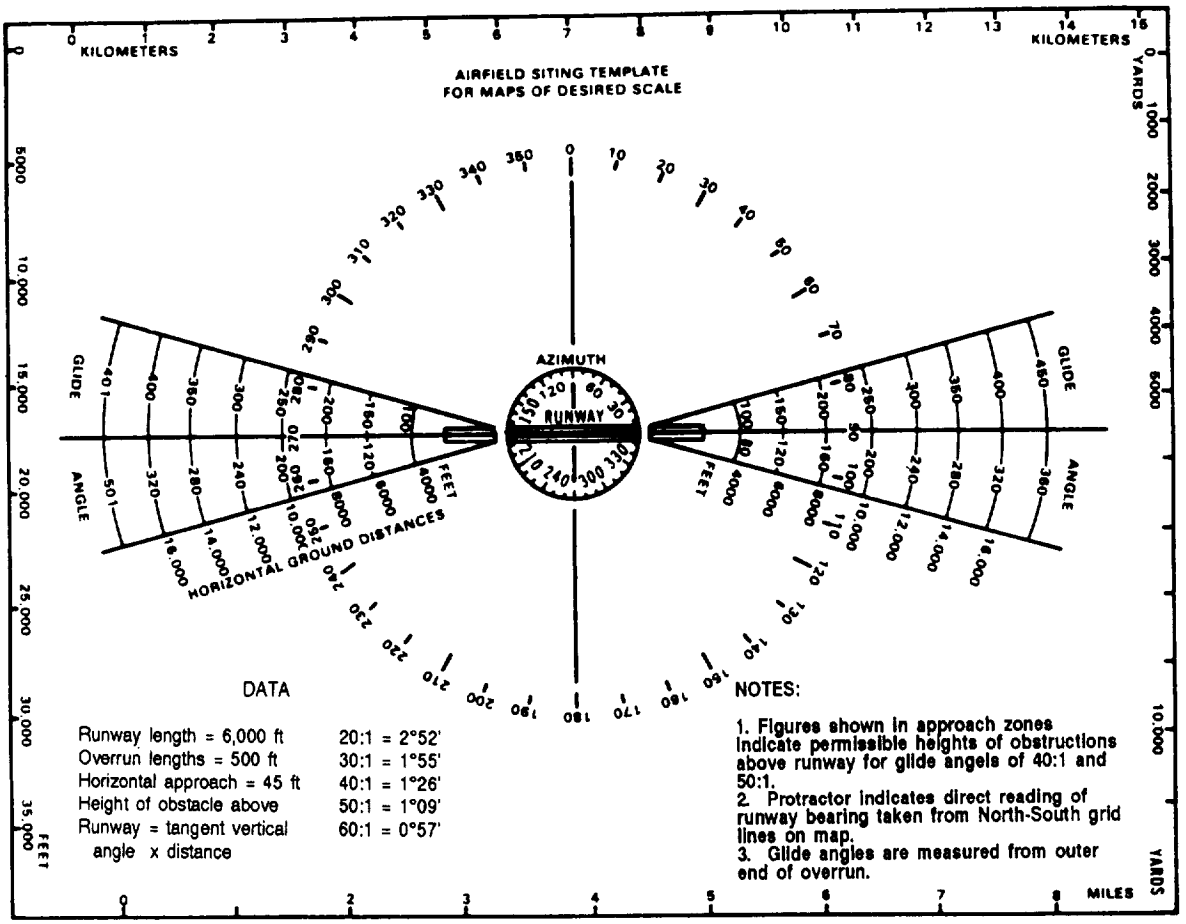

Figure 2-3. Sample airfield-siting template

the steep turns and maneuvers essential to continued observation.

- Proficiency in map reading. Upon approaching a designated or tentatively selected site for reconnaissance, the normal altitude for the first circuit is approximately 300 feet. Nothing more than orientation can be accomplished in this circuit. Sometimes a site tentatively selected during an area search can be eliminated during this circuit or the next few passes.

Similar second and third passes are flown. During these circuits, obstructions, main slopes, and general features are noted. The pilot begins to formulate an estimate of the flying-related characteristics of the field. Pinpoints for the ends of the runway are made on the map, but additional trips should be flown across the area, if necessary.

After the runway has been selected, an initial low pass is made at about 50 yards to one side of the proposed centerline. A second pass in the opposite direction is flown on the other side of the centerline. Both of these flights should be made at a constant air speed so the runway length can be estimated by multiplying the air speed by the average flight time.

NOTE: The length usually is overestimated when flying at low air speeds if a strong wind is blowing along the centerline. This can be decreased if the distances obtained by two passes in opposite

directions along the centerline are averaged (assuming the wind is constant).

A final circuit is then flown at approximately 200 feet. During this trip, the ends and centerline of the runway are given a final check, and the pilot completes the appraisal of the field's flying suitability.

In departing, the observer reviews dispersal areas and again checks access roads. Additional passes over the site are made if questions arise as a result of this last check. An air reconnaissance report similar to Figure 2-4, page 2-18, may be used.

An area reconnaissance then proceeds by similar inspection of other possible sites, Complete notes must be kept to avoid reviewing sites already checked however, a reinvestigation of the final site selected and any selected alternative sites may sometimes be necessary.

PROCEDURES FOR AIRFIELD GROUND RECONNAISSANCE

The general procedure for ground reconnaissance follows:

The ground-reconnaissance phase is preceded by map and air reconnaissance to discover what specific sites and questions warrant ground investigation.

En route to the site or sites to be investigated on the ground, the reconnaissance party should properly record the general condition of roads and bridges, the location of usable or repairable railheads, the locally available materials and equipment, and the potential water points. When reconnaissance of a definite site is involved, a more detailed observation of the access route should be made. A check must be made of bridge capacities, overhead clearances, and features that might hinder the movement of construction equipment to the site, as well as the suitability of railheads and sidings for use in construction. A detailed report of the quantity and quality of materials available at quarries, pits, and stockpiles must be prepared.

When the site to be surveyed is reached, the most likely locations for a runway must be investigated. If the terrain is open enough to permit good observation, these locations may be quickly determined. Locations for runways are traversed by vehicle or on foot. A rough survey of each selected runway is carried out immediately. Lengths are paced, critical slopes are measured with a clinometer, and directions are determined with a magnetic compass. The type of soil is noted and observations of a few samples are made. A preliminary check of a possible runway can be made in 15 minutes, if the country is reasonably clear and open.

If the country is rough and is not sufficiently open to permit a quick selection of runway locations, a detailed search must be made on foot. The reconnaissance officer, accompanied by necessary personnel, follows the centerline of the area for the runway and dispersal areas. The reconnaissance officer notes on a large-scale map or sketch all obstacles that cannot readily be eliminated, such as gullies, rock outcrops, and swampy areas. Examination of the results discloses the possible runway locations.

The best runway location is selected by considering these centerline investigations with prevailing wind direction, air approaches, glide angles, groundwater conditions, discharge areas for collected runoff, clearing, grubbing, and earthwork. If a suitable runway does not exist, a negative report on the site is submitted.

Once the selection of a potential runway is made, a careful and detailed walk of the centerline of each runway is made to recheck its suitability. Stakes are driven at each end of the runway and prominent features are properly referenced to later expedite the location of the selected runway by construction unit surveyors.

The survey sergeant of the reconnaissance party stakes out the centerline of the runway and runs a ground profile of it at the centerline and at each shoulder line. Levels are taken at 500-foot intervals and

AIR RECONNAISSANCE REPORT

DATE 05 JUL 92 NO. 4

1. To CO 327 ENGR BN 3. Sheet JOHANNASVILLE QUADRANGLE

2. From CO. C 4. 10 MILES NORTH OF JOHANNASVILLE
(Nearest main road center)

5. (a) Coordinates of EAST end of runway N3 765, E1 900

(b) Length (feet) 5000 FT. BUT MIGHT BE EXTENDED 2000 FT (SEE ITEM 12)

6. Classification of Site (overall):

Excellent ____ Good ✓ Fair ____ Poor ____ Reject* ____

7. Natural Surface Drainage:

Excellent ____ Good ✓ Fair ____ Poor ____

8. Flying Approaches:

Excellent ____ Average ✓ Poor ____

9. Clearing:

Light ✓ Moderate ____ Excessive ____

10. Aircraft Dispersal:

Unlimited ✓ Adequate ____ Inadequate ____

11. Access Roads:

Good ____ Adequate ✓ Inadequate ____

12. Remarks:
Extension mentioned in 5(b) above must be checked as there may be a swamp area in that suggested extension. Cannot be certain from air observation.

CPT MARK KUEHL
(Signature)

1400
(Time)

*If "Reject" classification is indicated, reason(s) for same will be given under remarks.

Figure 2-4. Air Reconnaissance Report

at intermediate breaks or slope changes. In flat country, this interval may be increased to as much as 1,000 feet. If an alternative runway is selected, a similar survey is conducted for that runway, if time permits. The soils analyst conducts a field investigation of the soil conditions at the site, Refer to Chapter 7 of this manual for more information about soil conditions.

Previously acquired information is checked at the site for accuracy. Errors, including discrepancies on maps and mistakes in aerial photograph interpretations, are included in the report. A suggested report format is shown in Figure 2-5:

When possible, local inhabitants are interviewed to check information already obtained and to obtain more information. Several opinions should be obtained. Questions should be phrased to provide the best comparison of answers. Information must be weighed carefully with regard for the credibility of each person questioned.

The reconnaissance of a designated site should be accomplished in one day, unless

RECONNAISSANCE REPORT
UNDEVELOPED AIRFIELD SITE

TO Commanding Officer 327 ENGR BN
FROM CO C CP _____ DATE 29 SEPT 93

Note – The reconnaissance party must be furnished with the following information
a Location of airfield general or specific
b Type of aircraft that will occupy the airfield
c Number of groups expected to occupy the airfield

1 DESIGNATION Name CHELTENHAM AIRFIELD Number 1
2 LOCATION BAYS VILLAGE OF MARYLAND MD DEPT
a Map reference OF PUBLIC IMPROVEMENTS (NAME and SCALE) b Elevation 225' FT
SCALE 1" = 200'
c Latitude & longitude 38°44'N LAT 76°40' WEST LONG Map coordinates N 328018 E 844109
d Nearby towns CHELTENHAM (POP 100) 1.5 MI DUE EAST FROM SITE
(Size distance and direction from site) GOOD GRAVEL ROAD FROM SITE
3 ROADS US 301 AT CHELTENHAM EXCELLENT BITMN WEST TO LOCAL ROAD NET
(Type condition bridges fords etc)
4 RAILROADS PENNSYLVANIA RR SIDING AT TOWN 2 MILES EAST OF SITE.
(Gage condition distance from site sliding capacity tunnels bridges)
5 GENERAL DESCRIPTION OF LANDING AREA AND SURROUNDING COUNTRY AGRICULTURAL AREA
US NAVAL RADIO STATION SITE NOW DETENTION HOME FOR DELINQUENT BOYS.
6 GLIDE ANGLES NEARLY UNLIMITED IN MOST DIRECTIONS SEE ITEM 7
(Direction slope distance) ANTENNA, FARM AT N.R.S IS 15 MI N OF SITE;
7 FLIGHT OBSTRUCTIONS AND MENTAL HAZARDS ELEVATED WATER TOWER AT B V M E OF SITE.
(Ravines cliffs mountains timber steeples chimneys towers power lines etc)
8 METEOROLOGICAL CONDITIONS WESTERLY WINDS - LITTLE FOG NORMAL MO PRECIPITATION AND RUN
(Prevailing winds storms frost precipitation temperature visibility)
9 HYDROLOGICAL CONDITIONS STREAMS ON EACH SIDE OF SITE RUN TO PISCATAWAY RIVER
(Streams ground water flood conditions tidal variations)
10 DRAINAGE GOOD NATURAL DRAINAGE
(Flat sloping direction number of culvert plan)
11 SOIL TYPES AND GEOLOGICAL DATA CLAY AND GRAVEL
(Sand gravel clay silt or combinations rock outcrops coral tuff caliche)
12 CLEARING NO EXTENSIVE CLEARING, FEW ISOLATED TREES - 4 ABANDONED FRAME BUILDINGS - WOULD HAVE TO BE REMOVED.
(Area size and density of timber rocks)
13 PROPOSED LAYOUT N.E-S.W RUNWAY USE EXISTING BLDGS 2500 FT RUNWAYS SUITABLE FOR
(Location and direction of runway and dispersal system (attach sketch)) C-130's AND C-123's
14 RECOMMENDED SURFACING AM2 OR SIMILAR PORTABLE SURFACING
(PSP SMT PRS mechanical stabilization coral tuff)
15 CAMOUFLAGE LITTLE NATURAL CONCEALMENT AFFORDED, ADEQUATE DISPERSAL POSSIBLE.
(Cover concealment dispersion deception)
16 BIVOUAC AREAS USE EXISTING DORMITORIES - WILL ACCOMMODATE 450 MEN
(Location size cover previously occupied)
17 WATER SUPPLY PUMPS, ELEVATED TANK AND DISTRIBUTION SYSTEM IN OPERATION, ADDED SMALL STREAMS AFFORD FIRE PROTECTION.
(Source location quantity quality) SEWAGE TREATMENT NEEDS REPAIR. POWER PLANT OPERABLE;
18 EXISTING FACILITIES ELECTRIC WIRING SUITABLE GENERATORS MUST BE INSTALLED
(Buildings storage power water sewerage) GRAVEL PIT 4 MI S MUCH TIMBER NEAR PIT
19 MATERIALS AVAILABLE POWER PLANT WAREHOUSE SPACE IN VILLAGE. CINDER PILE AT
(Equipment borrow pits gravel banks quarries mine dumps timber)
20 WORK ESTIMATE QUANTITIES
a Clearing NEGLIGIBLE
(Acres size of timber density)
b Drainage OPEN DITCHES AROUND PERIMETER OF RUNWAY AND TO STREAM
(Linear feet of open ditching number of culverts amount of pipe and approximate diameter)
c Earth moving ABOUT 4000 CUBIC YDS NO DARROW, SCOOP OR LONG HAUL.
(Estimate for R W T W H S)
d Surfacing LAY ABOUT 120,000 SQ FT AM2
(Quantity for R W T W H S recommended type)
e Roads access and service ACCESS EXIST SOME SERVICE - NEED SUPPLEMENTING
(Miles condition)
f Buildings PRESENT BLDGS SUITABLE BUILD CONTROL TOWER.
(Number and size suitability for operations quartering)
21 TIME ESTIMATE FOR COMPLETION 4 CO - DAYS
(Bn days or Co days)
22 ADDITIONAL INFORMATION 1" = 40' TOPOGRAPHIC MAPS AVAILABLE FROM MD DEPT OF PUBLIC IMPROVEMENTS, CIVILIAN PERSONNEL IN AREA COULD BE USED FOR CONSTRUCTION NATIVES APPEAR FRIENDLY. PART OF PROPOSED RUNWAY UNDER CONSTRUCTION. DAIRY HERD AND MILK PROCESSING PLANT AT SCHOOL
23 ANNEXES SEE ATTACHED MAP AND OVERLAY
(Maps photographs sketches estimates soil samples)
24 SIGNATURE _____
(In charge of reconnaissance party)

Figure 2-5. Ground Reconnaissance Report - Undeveloped Airfield Site

hostile forces delay the work. A specific reconnaissance of a captured enemy airfield is somewhat different from that outlined above. Detailed information about the existing facilities and their condition is desired. The specific information needed is indicated on the suggested form for reconnaissance reports of captured enemy airfields shown in Figure 2-6.

When the reconnaissance parties are operating at a considerable distance from the headquarters directing the reconnaissance, it is imperative that an initial report reach headquarters without delay. Use organic radio equipment and the suggested message format in Figure 2-7, page 2-22. The tactical situation may dictate the amount of information transmitted. Unit standing operating procedures (SOPS) should indicate what information is critical for radio reports. A complete, written report should follow the radio report.

The formats illustrated in Figure 2-4, page 2-18; Figure 2-5, page 2-19; and Figure 2-6, are suggested for written reports. The reports should include the same items of information shown on these forms. Suitable sketches should be attached to all written reconnaissance reports. Figure 2-8, page 2-23, is a typical sketch.

RECONNAISSANCE REPORT
CAPTURED ENEMY AIRFIELD

TO Commanding Officer 327 ENGR BN

FROM CO C CP _____ DATE 29 SEPT 93

1 DESIGNATION Name BONGO BONGO AIRFIELD Number 1

2 LOCATION PRINCIPALITY OF BONGO
a Map reference MAP #3 SCALE 1/500 Elevation 7500 Ft
(Name and Scale) (MSL)
c Latitude and longitude 40 53N, 37 23E Map coordinates N5 750, E3 235
d Nearby towns BONGO BONGO IS 28 MILES N E OF SITE POPULATION ABOUT 4000
(Size distance and direction from site)

3 RUNWAYS

	Length	Width	Grid az	Surface	Possible extension
No 1	E-W RUNWAY 4700	80	85°-265°	CONCRETE	+ 2300 FT
No 2	N-S RUNWAY 2700	60	350°-170°	CONCRETE	NONE
No 3	NONE				

4 HARDSTANDS Number 2 Type 1-300 FT x 300 FT N OF MAIN RUNWAY (CONCRETE) 1-300 FT x 300 FT E OF AUXIL RUNWAY (CONCRETE)

5 CONDITION OF AIRFIELD FACILITIES MAIN RUNWAY EXCELLENT BUT EAST
a Runways SECONDARY RUNWAY FAIR BUT NEEDS MINOR REPAIRS MOST 1000 FT NEEDS REBUILDING
b Taxiways GOOD
c Hardstands ABOUT HALF OF EACH USEABLE, ADJACENT TURF IN EXCELLENT SHAPE FOR LIGHT CRAFT
d Roads (Classify using symbols)
(1) Access FROM EAST A23/29FT Kb, FROM NORTH A24/30FT Kb
(2) Service A 11/17 Kb
e Gasoline storage EMBANKMENT-PROTECTED DRUM STORAGE AREA; NO TANKS ON PIPE LINE.
(Number of tanks capacity U S gals)
f Bomb and ammunition dumps SIMILAR TO ITEM E
g Serviceable hangars NONE IN SERVICEABLE OR REPAIRABLE CONDITION BURNED BUT CAN BE
(Size type condition)
h Office space available ONE 3 STORY BRICK BLDG 80FT x 50FT - EASILY RESTORED
ONE OPEN (Number of buildings sq ft) ROOFED AREA 300 FT x 20 FT W/WOOD BLOCK
i Shop space FLOOR FORMERLY USED AS SHOP AREA, ALMOST NO EQUIPMENT REMAINING.
(Number of buildings sq ft)
j Storage space Covered 2 FRAME BLDG 40 FT x 80 FT Open 1
k Drainage system STORM SEWER SYSTEM SLIGHTLY DAMAGED-NEEDS MINOR REPAIR, OUT FALL OF SYSTEM AT Open BONGO GRASS RIVER BORDERING SOUTH SIDE OF INSTALLATION
(Type extent and location of damages location of outfall)
l Utilities PUMPS AND PIPES ADEQUATE
(1) Water supply RIVER IS SOURCE NO PURIFICATION SYSTEM- FOR FIRE PROTECTION
(2) Sewerage system OUTDOOR LATRINE SYSTEM NEEDS CLEANING + REPAIR OR REBUILDING
(3) Electricity WIRING ADEQUATE-GENERATOR SYSTEM DAMAGED BEYOND REPAIR
(4) Heating systems (type) NONE NEEDED
m Other facilities CONTROL TOWER, ADEQUATE-20 TARGET RIFLE RANGE 20 MILES N
(Teletype control tower shooting gallery butts siding capacity)
n Railroads SINGLE TRACK NARROW GAGE R R BONGO BONGO TO AIRFIELD, 28 MILES. DOUBLE TRACK R R BONGO BONGO TO PORT
(Distance from airfield siding capacity condition)

6 PERMANENT TROOP HOUSING ON OR ADJACENT TO AIRFIELD
Capacity Officers 2-10 MAN BARRACKS EM 4-50 MAN BARRACKS

7 BIVOUAC AREAS PUBLIC PARK AREA ADJOINING AIRFIELD SUITABLE FOR BIVOUAC AREA, ABOUT 3 WOODED ACRES
(Location area cover previously occupied access road net)

8 UNDERGROUND SHELTER AVAILABLE NONE
(Number rooms height size)

9 DAMAGE CAUSED BY BOMBING AND DEMOLITION NONE EXCEPT AS PREVIOUSLY NOTED

10 SOIL TYPE & GEOLOGICAL DATA SANDY
(Sand gravel clay silt or combinations rock outcrops coral tuff caliche)

11 HYDROLOGICAL CONDITION BONGO GRASS RIVER ABOUT ½ MILE WIDE AT AIRFIELD FLOWS TO PORT HARBOR BONGO NAVIGABLE BY RIVER
(Streams ground water flood conditions)

12 METEORCGICAL CONDITIONS PREVAILING WINDS SOUTHERLY BUT EXTREMLY LIGHT PRECIPITATION ABOUT 20 IN PER YEAR OR OUTSTANDING WET SEASON
(Prevailing winds storms precipitation temperature visibility)

13 CONSTRUCTION MATERIALS AND EQUIPMENT NO CARLOADS OF CEMENT ON SIDING. GRAVEL PIT ON OTHER SIDE OF RIVER FROM AIRFIELD
(Gravel sand cement asphalt lumber glass tile hardware quarries timber machinery borrow pits mine dumps)

14 ADDITIONAL NFORMATION CHIEF OF VILLAGE LIVES NEAR AIRFIELD. NATIVES UNFRIENDLY. CHIEF SAYS PROBABLE SABOTAGE BY NATIVES OF VILLAGE

15 ANNEXES SEE ATTACHED SKETCH
(Maps photographs sketches overlays soil samples)

16 SIGNATURE Mark S Kinkle
(Title of reconnaissance party)

Figure 2-6. Ground Reconnaissance Report - Captured Enemy Airfield

AIR LANDING AREA REPORT

Air Landing Sites Letter designation	Explanation
A	Map sheet(s)
B	Date and time of collection of information
C	Location (grid references)
D	Runway (1) Bearing (2) Length and width (3) Gradients exceeding standards (4) Rough appraisal of earth work (5) Feasibility of runway extension
E	Drainage
F	Major obstacles to flying (1) Within the approach zone (2) Outside the approach zone but within 5 miles
G	Type of soil
H	Whether suitable area for dispersals can be found
I	Local resources
J	Approach roads

Airstrips (Runways) Letter designation	Explanation
A	Map sheet(s)
B	Date and time of collection of information
C	Location (grid references)
D	Dimensions
E	Type and condition of the airstrip
F	Access by road
G	Feasibility of runway extension
H	Any other information such as work required, in man-hours, to make the airstrip serviceable for sustained or limited operations

Report air landing areas by serial number. The appropriate letter designation must precede each category of information reported.

Figure 2-7. Air Landing Area Report

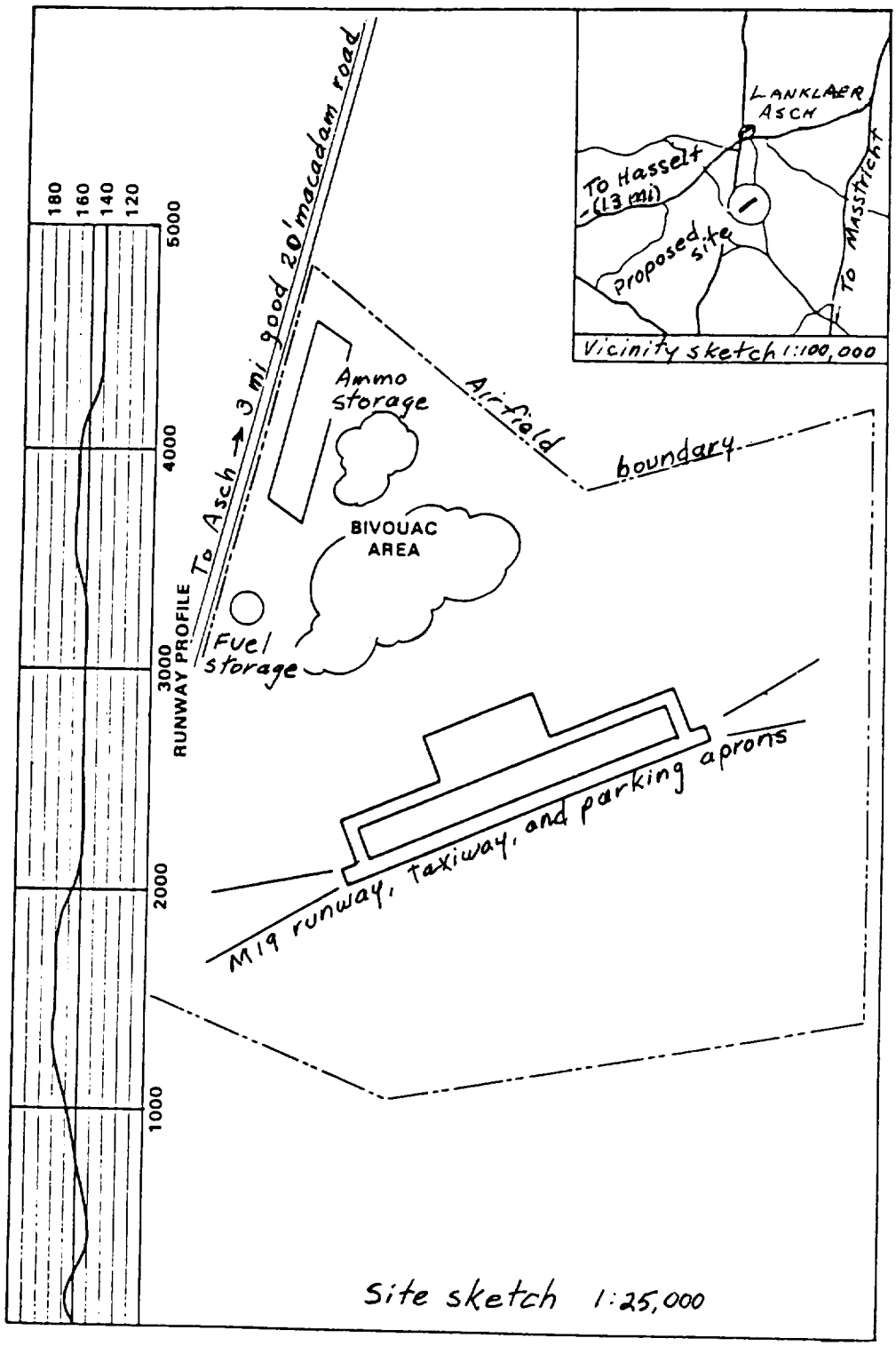

Figure 2-8. Typical sketch to accompany airfield reconnaissance report