Engineer Operations—
Echelons Above Brigade Combat Team

June 2015

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This publication supersedes ATTP 3-34.23, 8 July 2010.

Headquarters, Department of the Army
# Engineer Operations—
Echelons Above Brigade Combat Team

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Preface

ATP 3-34.23 describes engineer operations at echelons above brigade (EAB) combat team level. It is the doctrinal manual for engineer support to division, corps, and theater Army echelons. This manual is an extension of FM 3-34 and is linked to joint and Army doctrine to ensure that it is useful for operational commanders and staffs. This manual serves as a guide for the application of engineer combat power and the employment of engineer forces in support of decisive action primarily at higher echelons and within a joint framework.

The principal audience for ATP 3-34.23 is engineer commanders and trainers at higher echelons. This manual forms the foundation for the engineer curriculum contained in the engineer portions of the Army Education System. The information contained in this manual will assist multinational forces and other Services and branches of the Army in planning and integrating engineer capabilities. This manual will also assist Army branch schools in teaching the integration of engineer capabilities into Army and joint operations.

Commanders, staffs, and subordinates ensure that their decisions and actions comply with applicable United States (U.S.), international and, in some cases, host nation (HN) laws and regulations. Commanders at all levels ensure that their Soldiers operate according to the law of war and the rules of engagement. (See FM 27-10.)

Unless stated otherwise, masculine nouns or pronouns do not refer exclusively to men.

ATP 3-34.23 uses joint terms where applicable. Selected joint and Army terms and definitions appear in both the glossary and the text. For definitions shown in the text, the term is italicized and the number of the proponent publication follows the definition. This publication is not the proponent for any Army terms.

ATP 3-34.23 applies to Active Army, Army National Guard/Army National Guard of the United States, and U.S. Army Reserve unless otherwise stated.

The proponent of ATP 3-34.23 is the U.S. Army Engineer School. The preparing agency is the Maneuver Support Center of Excellence (MSCoE) Capabilities Development and Integration Directorate; Concepts, Organizations, and Doctrine Development Division; Doctrine Branch. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, U.S. Army Maneuver Support Center of Excellence, ATTN: ATZT-CDC, 14000 MSCoE Loop, Suite 270, Fort Leonard Wood, MO 65473-8929; e-mail the DA Form 2028 to <usarmy.leonardwood.mscoe.mbx.cdiddengdoc@mail.mil>; or submit an electronic DA Form 2028.
Introduction

While the nature of war has remained constant throughout history, war continually changes in response to new concepts, capabilities, and organizations. ATP 3-34.23 provides engineer doctrine for operating at EAB in support of decisive action. This manual is linked to FM 3-34 and other joint and Army doctrine to ensure that it is useful for commanders and staffs at higher echelons. This manual—

- describes the engineer operations integrated through the warfighting functions in a combined arms application of combat power.
- describes the engineer capabilities available to commanders and provides information for force-tailoring these capabilities at higher echelons to ensure synchronization throughout the operations process and across the range of military operations.
- discusses the foundation of engineer operations to ensure integration at each echelon and develops considerations for engineer operations within the operations process, tailored organization, range of military operations, and headquarters configuration unique to the division, corps, and theater Army echelons.

This manual emphasizes the simultaneous combination of offensive, defensive, and stability or defense support of civil authorities (DSCA) tasks. It describes engineer support to Army forces conducting decisive action within the framework of joint operations. It also addresses the engineer roles and functions with unified action partners (potentially under multinational or interagency leadership) and within diverse command relationships.

The manual is organized into five chapters and three appendixes that provide additional details on selected operational topics. A brief description of each chapter is below:

- **Chapter 1.** Chapter 1 describes the engineer view of the operational environment as it pertains to operations at EAB combat team. It describes the forces and capabilities available (including unified action partners) and addresses the tailoring of engineer force pool capabilities in support of engineer operations.
- **Chapter 2.** Chapter 2 lays the foundation for engineer operations at EAB. It focuses on integration at each echelon and throughout the operations process. It discusses the engineer staff by echelon, capabilities within the engineer disciplines, and synchronized application of these capabilities through the warfighting functions.
- **Chapter 3.** Chapter 3 describes engineer operations at the theater echelon. It discusses integration into the theater Army design methods, force-tailoring considerations at the theater echelon, and engineer support in each of the operational configurations described for a theater Army headquarters.
- **Chapter 4.** Chapter 4 describes engineer operations at the corps echelon. It discusses integration into the corps operations processes, force-tailoring considerations, decisive action at the corps echelon, and engineer support in each of the operational configurations described for a corps headquarters.
- **Chapter 5.** Chapter 5 describes engineer operations at the division echelon. It discusses integration into division operations processes, force-tailoring considerations, decisive action at the division echelon, and engineer support in each of the operational configurations described for a division headquarters.

The foundation of engineer operations provided in this manual, combined with related engineer doctrine, supports the actions and decisions of engineer commanders at all levels; however, this manual is not meant to be a substitute for thought and initiative among engineer leaders. No matter how robust the doctrine or advanced the new engineer capabilities and systems, engineer Soldiers must understand the operational environment, recognize shortfalls, and adapt to the situation on the ground. The adaptable and professional engineer Soldiers are most important to the future of the engineer regiment. These Soldiers must be able to successfully perform the basic skills and accomplish the mission with or without technological assistance.
Chapter 1

Engineer Force Organization

The diverse, global operational environments of today require responsive engineer forces that are tailored to the combatant commander’s needs. Brigade combat teams (BCTs) and functional brigades are regionally aligned to be used as part of force packages that enhance flexibility and responsiveness for higher-echelon headquarters (division, corps, or theater Army). Engineers assigned to these higher-echelon headquarters provide critical roles in unified land operations. These engineers provide expertise that contributes to a broader and deeper understanding of the operational environment assessment and assists in defining the combatant commander’s needs. No single, large, or fixed formation can support the diverse requirements of all operational environments. To meet joint requirements, the Army organizes its forces to provide a mix of land combat power that can be tailored for a combination of offense, defense, and stability or DSCA tasks as part of an interdependent joint force.

CAPABILITIES

1-1. ADP 3-0 emphasizes the integral role of Army forces in unified actions that execute campaigns and major operations. Army commanders, especially those at EAB, require significant engineer support in conducting operations, and much of this support comes from unified action partner capabilities. Army engineer forces provide an essential capability that is readily available for combat power application. Army engineers also provide a vital coordinating link for applying other capabilities in unified action operations.

1-2. The engineer regiment represents Army engineer capabilities in the operating and generating forces (see figure 1-1, page 1-2). The regiment supports joint operations and has experience in providing interagency support and leveraging nonmilitary and nongovernmental engineer assets to support mission accomplishment.

1-3. The engineer disciplines are the areas of expertise within the engineer regiment. These disciplines are combat, general, and geospatial engineering. Each discipline is focused on the capabilities that support, or are supported by, the other disciplines. (See FM 3-34 for more information on the engineer disciplines.) The joint force commander and joint force engineer must understand the engineer capabilities and limitations of each Service to effectively and efficiently tailor the engineer force. These disciplines are designed to relate specific Service capabilities to joint capability areas and actual requirements. Services use these disciplines to categorize forces and assets based on their primary discipline. U.S. forces can sometimes perform tasks from other disciplines, but engineer forces and assets are not interchangeable. Planners must carefully identify the capabilities required for an operation and the forces that have those capabilities.

1-4. Engineers in the operating force operate at the strategic, operational, and tactical levels across the range of military operations. Units are organized in a scalable, adaptable manner to support combat, general, and geospatial engineering requirements. Army engineer forces operate as integral members of the combined arms team to provide a full range of engineer capabilities in conjunction with the United States Army Corps of Engineers (USACE).
1-5. There are four complementary and interdependent categories of engineer units in the operating force (including USACE contract construction and technical deployable assets). The four categories include organic engineers (and staff elements) and three other categories, which are held in an engineer force pool.
The assets in the force pool reside at EAB and exist to augment BCT capacity and capability where engineering expertise is required. The EAB consists of an engineer headquarters unit, baseline units, and specialized engineer units (see table 1-1).

### Table 1-1. Operating-force engineers

<table>
<thead>
<tr>
<th>Engine Elements</th>
<th>Component</th>
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<tr>
<td></td>
<td>Regular Army</td>
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<tr>
<td>### Organic engineers</td>
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<tr>
<td>Brigade engineer battalion</td>
<td>X</td>
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<tr>
<td>BCT engineer company</td>
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<tr>
<td>Geospatial engineering team</td>
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<tr>
<td>### Engineer headquarters</td>
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<tr>
<td>Theater engineer command</td>
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<tr>
<td>Engineer brigade headquarters</td>
<td>X</td>
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<tr>
<td>Engineer battalion</td>
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<tr>
<td>### Baseline engineer units</td>
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<tr>
<td>Sapper company</td>
<td>X</td>
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<tr>
<td>Mobility augmentation company</td>
<td>X</td>
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<tr>
<td>Clearance company</td>
<td>X</td>
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<tr>
<td>Engineer support company</td>
<td>X</td>
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<tr>
<td>Horizontal construction company</td>
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<tr>
<td>Vertical construction company</td>
<td>X</td>
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<tr>
<td>Multirole bridge company</td>
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<tr>
<td>### Force Pool</td>
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<td>Survey and design team</td>
<td>X</td>
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<tr>
<td>Mine dog detachment</td>
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<td>Concrete section</td>
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<td>Asphalt team</td>
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<td>Firefighting team</td>
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<td>EH team or coordination cell</td>
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<tr>
<td>Diving team</td>
<td></td>
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<tr>
<td>Topographic company or platoon</td>
<td>X</td>
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<tr>
<td>Geospatial planning cell</td>
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<td>Construction management team</td>
<td>X</td>
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<td>Engineer facility detachment</td>
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<td>Engineer utilities detachment</td>
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<td>Prime power company*</td>
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<td>Technical rescue company</td>
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<td>Well-drilling team</td>
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<td>Quarry platoon</td>
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<td>Real estate team*</td>
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<td>Forward engineer support team main*</td>
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<td>Forward engineer support team advance*</td>
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<td>Area clearance platoon</td>
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*USACE assets
Chapter 1

Table 1-1. Operating-force engineers (continued)

<table>
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<th>Legend:</th>
<th>Description</th>
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<tr>
<td>ARNG</td>
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<td>BCT</td>
<td>brigade combat team</td>
</tr>
<tr>
<td>EH</td>
<td>explosive hazard</td>
</tr>
<tr>
<td>USACE</td>
<td>United States Army Corps of Engineers</td>
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<tr>
<td>USAR</td>
<td>United States Army Reserves</td>
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FORCE TAILORING

1-6. Engineer planners at the theater Army (and the theater engineer command [TEC] when deployed), with input from the appropriate corps and division headquarters, select engineer forces according to mission variable analysis and recommend a deployment sequence. Actual requirements for engineer forces in a campaign seldom match planning figures. Actual requirements typically exceed planning figures. Tactical requirements are difficult to fully define at operational levels. Engineer planners at the theater Army echelon gain a broad understanding of operational requirements but must rely on subordinate echelons to assist with defining tactical requirements. Engineer planners must also consider and leverage a variety of other engineer capabilities that may be available for meeting or mitigating requirements.

1-7. The EAB engineer planners will consider other various engineer capabilities to meet operational and, in some cases, tactical requirements. A designated Department of Defense (DOD) contract construction agent is supported by a designated DOD contract construction agent (usually USACE) and may have mission support capabilities available. The joint task force (JTF) typically calls upon its contract construction agent assets when construction requirements exceed available troop construction capabilities. Planners review operational and mission variables, considering the available local engineer resources (including HN military, civilian sources, and unified action partner capabilities). Despite fully accounting for all contract and other resources available, operational engineer planners typically identify remaining unmet requirements for which they must effectively force-tailor engineer capabilities from the regiment.

1-8. Theater Army engineer planners will understand some requirements better than others. Typically, the theater Army echelon will clearly understand the various engineer support requirements for accessing the theater and establishing a sustainment base. Many of these requirements may be translated to potential engineer missions and related tasks (for example, theater engineer planners must know the requirements with enough clarity for upgrading selected sea and aerial ports of debarkation [including tentative designs, plans, and estimates]). The TEC planners are uniquely qualified with specific capabilities and skills, which qualify them to assess aerial ports of debarkation and seaports of debarkation. Similarly, a selected ground line of communication may require construction activities that can be clearly defined. The most well-defined requirements tend to focus on operational support, and most engineer support at this level is organized within the general engineering and geospatial engineering functions.

1-9. Theater Army echelon engineer force planners do not disregard tactical requirements. They must analyze operational and mission variables to determine and shape the engineer forces required for tactical operations of subordinate echelons. These forces will include capabilities organized in the combat, general, and geospatial engineering disciplines. Since the theater Army echelon analysis may not include the full resolution of tactical requirements, the subordinate echelon corps and division headquarters offer refinements for the engineer forces required to support a more detailed concept of operations. For example, based on an understanding of the physical environment in a potential area of operations (AO) and an initial design for operational maneuver, the engineer planner may identify the requirements for a number of gap crossings to be performed by subordinate tactical elements. After consideration for joint, multinational, and other capabilities, the engineer planner may determine and shape baseline engineer forces that are capable of supporting gap-crossing requirements. As corps, division, and subordinate engineer planners add depth to AO understanding and develop a scheme of maneuver, shaping baseline forces to support gap crossings allocated by the higher-echelon design will be impacted by decisions on timing, locations, and other factors that refine the gap-crossing design.
1-10. Prioritization occurs in applying the tailored engineer forces that are most effective against actual requirements. EAB engineer staff and planners recommend priorities to the commander based on the continuous assessment that is provided through the running estimate. The EAB engineer staff also shapes the organization of the tailored forces for conducting engineer operations. Tailoring the engineer force should not be confused with task organizing. Tactical and operational commanders organize and reorganize groups of tailored engineer units for specific missions. Task organizing is the process of allocating available assets to subordinate commanders and establishing their command and support relationships. The flexibility to meet evolving engineer requirements as an operation depends directly on the ability to efficiently task-organize the tailored engineer force and integrate it within the gaining or supported force.

DEPARTMENT OF DEFENSE CONSTRUCTION AGENTS

1-11. The DOD authorizes several agents to execute contract construction on its behalf, including USACE, Naval Facilities Engineering Command, Air Force Civil Engineer Center, and other agencies as approved by the DOD (see DODD 4270.5). Contract construction agency capabilities are cost-reimbursable, meaning that the supported customers must fully fund all services provided. These organizations can be powerful force multipliers and provide significant engineering capabilities in joint operations. While contract construction agents have an ongoing daily mission to provide services within the United States (including military construction on established garrison locations), they also have an important contingency mission to support military operations. Engineer planners must consider what contract construction agents can contribute to strategic operations to appropriately communicate engineer capabilities to the JTF commander.

1-12. The combatant commander may use approved contract construction agents for technical engineering assistance and for the design, award, and management of construction projects supporting joint forces deployed worldwide. The Secretary of Defense has designated specific worldwide areas of responsibility to USACE, Naval Facilities Engineering Command, and Air Force Civil Engineer Center for Design and Construction Execution (see JP 3-34 and DODD 4270.5 for location responsibilities). Generally, the combatant command will call upon the contract construction agent when theater construction requirements exceed the troop construction capability. Contract construction agents are an important planning tool for strategic construction because they are designed to deliver high-value projects that are typically used for extensive military construction and/or infrastructure rebuilding in a HN. Contract construction agents maintain in-depth expertise in engineering research and development and possess inherent planning and engineer capabilities for advanced base and infrastructure development. (See FM 3-34 for more information.)

MULTIFUNCTIONAL ORGANIZATIONS

1-13. Mission command for engineer capabilities and missions is primarily provided by the TEC, engineer brigade, and engineer battalion. Multifunctional units at brigade and battalion echelons may also provide mission command for engineer forces when engineer support is integral to the multifunctional mission. While mission variables are analyzed to determine task organization, the analysis of operational variables provides information for tailoring functional and multifunctional headquarters. The division construct usually starts with a maneuver enhancement brigade (MEB) and then adds a functional engineer brigade when the type (technical requirement) or size (magnitude of subordinate engineer elements) of the engineer mission or the requirement to integrate engineer capabilities across the force becomes too large for the MEB. The corps level normally starts with at least an engineer brigade and expands to other engineer brigades, as necessary. In some instances, a MEB may also be required at the corps level (for example, to provide mission command for a seaport of debarkation or aerial port of debarkation [both are terrain-focused] during early-entry operations). The MEB provides multifunctional capability with a smaller footprint and has the ability to control terrain for these types of operations. Support brigades are not fixed organizations. All support brigades, except the combat aviation brigade, are designed around a small base of organic elements to which a mix of additional capabilities is added based on mission variables.

Special Troops Battalion

1-14. The special troops battalion is a multifunctional battalion within the armored BCT and infantry BCT. This special troops battalion provides the BCT with military intelligence support, communications, engineer,
military police, and chemical, biological, radiological, and nuclear reconnaissance and surveillance capabilities. The special troops battalion is organized with a—

- Special troops battalion headquarters and headquarters company.
- BCT headquarters and headquarters company.
- Military intelligence company.
- Network support company.

1-15. The special troops battalion of the infantry BCT and armored BCT each have an engineer company although the composition varies. The special troops battalion headquarters and headquarters company has command and staff sections; a military police platoon; a chemical, biological, radiological, and nuclear reconnaissance platoon; a support platoon (with medical support, maintenance, Class III supplies, and field feeding); and a security section. (See FM 3-90.61 for additional information on the special troops battalion.)

**Maneuver Enhancement Brigade**

1-16. The MEB is designed to—

- Receive and control forces.
- Provide protection and mobility.
- Prevent or mitigate the effects of hostile action against divisional forces.

1-17. The MEB mission is to preserve freedom of maneuver for operational- and tactical commanders by controlling terrain and facilities and preventing or mitigating hostile actions against the protected force. The MEB has a combined arms staff and is task-organized according to mission requirements. It has mission command capabilities that suit it for a variety of missions. The MEB typically controls combinations of several different types of battalions and separate companies (civil affairs; chemical, biological, radiological, and nuclear; engineer; explosive ordnance disposal; military police; and, in special situations, air and missile defense or a tactical combat force).

1-18. In addition to the MEB, the supported headquarters may be tailored with functional brigades to support the force as a whole or to carry out a particular task. The MEB may be required to provide support to these additional functional brigades (for example, in addition to a MEB, a division might receive a military police brigade to control displaced civilians and process detainees). In this case, the MEB may be tasked to provide general engineering support to the military police brigade from its assigned engineer battalion to construct detainee facilities. An engineer brigade is provided to a division or higher organization when the magnitude of functional engineer requirements exceeds the span of control of the MEB. Some functional capability (such as an engineer battalion) will likely remain under the MEB even when a functional engineer brigade is provided to the division.

**Brigade Engineer Battalion**

1-19. The brigade engineer battalion in each of the BCTs provides a baseline of engineer capabilities, which can be augmented with specialized units from the EAB. The assistant brigade engineer section within the BCT staff identifies required augmentation and coordinates its application. Each BCT also has organic geospatial engineering capabilities to provide a baseline of geospatial support. The conversion of special troops battalions to the brigade engineer battalion in armor and infantry BCTs reflects a separate engineer company as well. (See FM 3-90.61 for information on the units that have not transitioned to a brigade engineer battalion.) The brigade engineer battalion has mission command of assigned and attached engineer companies. The brigade engineer battalion is assigned a military intelligence company; a signal company; and a chemical, biological, radiological, and nuclear reconnaissance platoon (located in the headquarters and headquarters company). In the Stryker BCT, the battalion also provides mission command for an antitank company. The brigade engineer battalion provides maneuver support for bridging, breaching, route clearance, explosive hazard (EH) neutralization, and horizontal construction.

**United States Army Corps of Engineers**

1-20. USACE is the Army direct reporting unit with responsibility to execute Army and DOD military construction, execute real estate acquisition, and develop the national infrastructure through the civil works
program. USACE divisions, districts, and offices remain under the USACE commanding general. USACE
provides unique capabilities (technical engineering assistance and contract construction) that complement
the operational Army force.

1-21. USACE provides technical engineering assistance to the operational force using its field force
engineering (FFE) program. The FFE draws on USACE capabilities from the engineer disciplines (primarily
general engineering) to support operations through reachback and forward presence. The FFE forward
presence includes deployable teams designed and trained to provide technical engineering assistance in
operational areas.

CORPS

1-22. The corps is the premier headquarters of the Army for joint operations and can rapidly transition to a
JTF or joint force land component command (JFLCC) headquarters for contingency operations. The corps
can deploy to any area of responsibility to provide mission command for Army, joint, and multinational
forces. The corps does not have echelon-specific units other than the organic corps headquarters. The corps
can control any mix of modular brigades and divisions and other Service or multinational forces.

1-23. The corps engineer force (including joint engineer elements or a joint engineer headquarters) is tailored
to meet the anticipated requirements based on operational environment analysis. In some situations, the corps
may require a combination of engineer forces organized functionally and multifunctionally. While battalion
or brigade echelons of engineer or multifunctional headquarters may be allocated as a corps engineer
headquarters, the functional engineer brigade headquarters is more typical for most operations. In the case of
the corps assuming a role as a JTF, JFLCC, or multi-Service headquarters, a deployable command post of
the TEC may be employed to unify the efforts of engineers for the JTF or JFLCC.

DIVISION

1-24. Divisions are the primary tactical warfighting headquarters for the Army. Their principal task is
directing subordinate brigade operations. Divisions are not fixed formations. Divisions do not have organic
forces beyond their headquarters elements. The organic structure of a division includes a communications
network, life support, and command post elements. With appropriate joint augmentation, a division can be
the JTF or JFLCC headquarters for small contingencies. The headquarters is organized functionally. It
includes an organic joint network capability and liaison teams.

1-25. Divisions have no organic structure beyond the headquarters, and all brigade types may not be present
in an operation. In some operations, divisions may control more than one of a particular type of support
brigade. They may also control functional groups, battalions, or separate companies; however, these are
normally task-organized to a brigade. Each division is tailored for a specific operation, and the composition
of the division varies. For a major combat operation, divisions should have at least one of each type of support
brigade.

1-26. The tailored engineer force that supports a division is not set by the rules of allocation. The force is
tailored to meet anticipated requirements based on the operational environment analysis and mission
variables. The divisional engineer force may be organized under a multifunctional headquarters (such as the
MEB) or under a functional engineer headquarters. In some situations, the division may require a combination
of engineer forces that are organized functionally and multifunctionally. While battalion or brigade echelons
of engineer or multifunctional headquarters may be allocated as the divisional engineer headquarters, a
brigade echelon headquarters is typical for most operations.

THEATER

1-27. In major combat operations, the theater Army normally receives one TEC (see figure 1-2, page 1-8).
The TEC provides mission command and an organizational framework for strategic- through operational
engineer effort within the area of responsibility. The TEC focuses on reinforcing and augmenting tactical
engineer efforts and developing a theater sustainment base. This focus involves conducting engineer
operations that support Army design methods and coordinating engineer operations that support subordinate
tactical echelons. The TEC supervises geospatial support, construction, real property maintenance activities,
lines-of-communication sustainment, engineer logistics management, and base development. The TEC conducts reception, staging, onward movement, and integration of nonorganic BCT engineer units (unified action partner engineer units, baseline, and specialized engineer units) to the theater. The TEC is primarily responsible for engineer aspects of theater opening, infrastructure repair and development, and theater transfer or closure. The TEC is responsible for integrating engineer capabilities horizontally and vertically between commands for resources assigned or attached to unified or specified commands.

![Legend:
C2 command and control
cbt combat
const construction
EHCC explosive-hazard coordination cell
FEST forward engineer support team](image)

**Figure 1-2. Notional TEC**

JOINT AND OTHER CAPABILITIES

1-28. In unified land operations, Army engineers operate as part of a joint force and often within a multinational and interagency environment. Each Service has core engineer units and capabilities that stem from their traditional roles and associations to meet specific operational needs and to support the accomplishment of a variety of mission requirements in any operational area. An understanding of the engineer capabilities and limits of each Service and the increasing interdependence between Service engineers in joint operations allows the joint force commander and the joint force engineer to tailor the engineer force to effectively and efficiently accomplish the mission. The joint force commander should understand multinational, interagency, nongovernmental organization, and intergovernmental organization engineer capabilities to better coordinate coherent activity, develop viable courses of action (COAs), and properly integrate them into the joint operation. The joint force engineer is responsible for providing comprehensive recommendations to the joint force commander on the effective employment of all engineer capabilities in support of joint operations. Recommendations are developed in collaboration with identified engineer unit commanders that are tailored to support the operation as soon as collaboration is feasible. The joint force commander, with the assistance of the joint force engineer, analyzes mission requirements to tailor optimal engineer force packages. The engineer capabilities of each Service component may provide engineer support to the other components to meet joint force requirements. (See JP 3-08 and JP 3-34 for a further discussion of engineer participation in joint, interagency, and multinational operations.)

1-29. Joint integration does not require joint commands at all echelons, but it does require an understanding of joint operations. Joint synergy extends the principles of combined arms to operations that are conducted by two or more Service components and their ability to inculcate interoperability. The strengths of each Service or functional component combine to overcome limitations or reinforce the effects of the other components. The combination of multiple and diverse joint force capabilities generates combat power that is more potent than the sum of its parts. Integrating the variety and special capabilities of engineer organizations requires an understanding of the various capabilities and limitations of the engineer assets available for any given mission. Integration also requires a common understanding of the command and control structure and processes in place to employ the engineer capabilities in unified action. (A brief summary of Service engineer capabilities is provided in FM 3-34 and JP 3-34.)
ADDITIONAL ENGINEER CAPABILITIES

1-30. In addition to U.S. military engineer forces (including USACE and other Service-equivalent organizations), multinational engineers can provide valuable capabilities multinational military units and civilian contractors. In addition to providing labor, material, infrastructure, and services, may possess certain engineer capabilities that are specifically adapted to the local environment. There are other benefits to using multinational military units and civilian contractors, but these benefits need to be weighed against the limitations. This mixture of capabilities may change during the operation phases and may require management across Service lines to ensure that the joint force commander has the appropriate forces in place.

1-31. The Department of State, U.S. Agency for International Development, and other interagency partners may deploy capabilities in the theater. These capabilities integrate engineer efforts within the context of their diplomatic and development missions. The Department of State may establish an office of the coordinator for reconstruction and stability with a substantive or lead role in the development and execution of certain security sector reform programs. The U.S. Agency for International Development may participate in establishing provincial reconstruction teams as interim civil-military organizations to develop local institutional capacity for the provision of basic services and other governmental functions. These agency capabilities and the nongovernment development agency efforts they coordinate offer challenges and opportunities for engineers at EAB to achieve a unity of engineer effort in a complex operational environment.

1-32. The HN engineer capabilities may be available if adequate technical capacity and infrastructure exists. Potentially, this could include a wide array of civil and public works organizations. It is also increasingly common to contract for a wide range of engineer services with local or third party national organizations and civilian contractors. These assets are typically used to free up military construction assets and minimize the military footprint in a theater when requirements exceed military capabilities or when the engineer operations and requirements are to be conducted in areas that are relatively safe from active combat. Consideration must be given to providing adequate contractor oversight when this option is employed and should include the identity vetting of HN personnel when possible. Additionally, emphasis should be placed on using local construction techniques and employing local contractors when feasible. This emphasis typically assists in building local technical capacity.

CIVILIAN AUGMENTATION PROGRAMS

1-33. Civil augmentation programs (Army Logistics Civil Augmentation Program, Navy global contingency construction and contingency service contract programs, and Air Force contract augmentation programs) play a significant role in mission accomplishment by providing additional options and flexibility in general engineering and logistics support. Construction may be within the scope of any of these contract services. The EAB engineers recommend construction under a civil augmentation program option when the analysis of mission variables dictates that this is the most effective option (for example, if limited military construction assets are already required for other missions in less permissive areas). The EAB engineers are better suited than contract engineers when work is ill-defined, is on short-notice, has volatile site conditions, or presents a high risk to break a normal work contract. Even when this option is selected, the EAB engineers (units and staffs) continue to have a significant role in optimizing the delivery of construction by appropriately mixing troop construction, the Army Logistics Civil Augmentation Program, and other contracted construction support to meet the needs of the commander.

DOMESTIC CAPABILITIES

1-34. The Department of Homeland Security is the primary federal agency in charge of reducing U.S. vulnerability to domestic incidents, emergencies, and disasters. State (Army National Guard and others), local (first responders and private organizations), and federal responders are coordinated by the Department of Homeland Security in a federal response that may include DSCA operations. The Department of Homeland
Security is responsible for two primary documents that describe national policy and procedures for effective, coordinated, and multiorganization incident response operations as follows:

- **The National Incident Management System.** The National Incident Management System contains the initial guidance required for establishing multiorganization command and management structures (these are somewhat comparable to a military headquarters structure) for a disaster response, from the local to federal level. It provides the primary core concepts, principles, and terms that enable all organizations, from local to federal level, to work together effectively. The primary command and management structure and terms described in the National Incident Management System serve as a foundation for the additional guidance and procedures contained within the National Response Framework.

- **The National Response Framework.** The additional guidance and procedures in the National Response Framework include the organizations that are involved based on the type of incident and level of required response. The National Response Framework gives guidance on who does what from the local to federal level (including private, nongovernmental, volunteer, and governmental organizations).

1-35. Engineers at EAB must be familiar with the fundamentals of the National Incident Management System and National Response Framework. The degree of familiarity required depends upon the anticipated level of required coordination. A general understanding of the National Incident Management System and National Response Framework helps ensure unity of effort across all organizations when planning for and conducting DSCA operations.
Chapter 2

Foundations of Engineer Operations

ADP 3-0 emphasizes operations that simultaneously combine offensive, defensive, and stability or DSCA tasks by defining a distinct operational concept around decisive action. Army forces conduct decisive action within the larger framework of joint operations and unified action. Engineer capabilities are significant force multipliers in decisive action, facilitating the freedom of action that is necessary to meet mission objectives. This chapter describes characteristics and considerations for engineer operations that focus on EAB. At higher echelons, engineer operations simultaneously combine tasks that support offensive, defensive, and stability or DSCA tasks across the range of military operations. The technical aspects of higher-echelon engineer tasks become increasingly essential to the effective application of engineer support. Engineer support efforts at EAB must remain integrated within the combined arms framework. Integration enables a synchronized application of combat power that maximizes the effect of engineering efforts. Integration is a foundation for engineer operations. Integration is within the supported unit staff, throughout the operations process, and across the force.

INTEGRATION

2-1. Decisive action follows a cycle of planning, preparation, execution, and continuous assessment. The operations process is the context within which engineer capabilities are integrated into combined arms maneuvers. At every echelon, from BCT to theater Army and JTF, engineer leaders exercise mission command and staffs support the commander’s mission command system.

PLANNING

2-2. The levels of war are doctrinal perspectives that clarify the relationship between strategic objectives, the operational approach, and tactical actions. The EAB engineer planners are primarily focused on the operational to tactical perspective. Comprehensive, continuous, and adaptive planning characterize successful operations at the operational and tactical levels of war. The scope, complexity, and length of planning horizons differ between the two levels—

- **Operational.** Operational planning involves broader dimensions of time and space than tactical planning. Operational planning is often more complex and less defined. Operational planners—
  - Are often required to define an AO, estimate the required forces, and evaluate operational requirements.
  - Mesh Service capabilities with joint and unified action partners.
  - Program and manage multiple budget channels to receive and execute funds from outside agencies.
- **Tactical.** Tactical planning has the same clarity of purpose as operational planning but has a shorter planning horizon. Tactical planning proceeds from an existing Army design methods. Normally, AOs are prescribed objectives, available forces are identified, and the sequence of activities is specified for tactical commanders. The plan guides subordinates as they progress through the operation.

2-3. Commanders use their staffs and integrate input from subordinate commanders into their planning processes. Engineer leaders must understand, and be integral participants in, the planning processes that impact engineer operations at their echelon of employment. Supporting engineer unit commanders and
leaders conduct parallel planning processes which provide effective outcomes for the engineer units employed and the appropriate input to the higher commander’s process. Geospatial support elements and engineer staff planners integrate directly within the planning staff at each echelon to participate in the planning process.

2-4. Engineer operations are complex and resource-intensive and require extensive and proactive coordination. Additionally, a successful engineering effort requires an understanding of all engineer requirements (combat, general, and geospatial) and their role in supporting the concept of operations. Engineer operations must be directed and synchronized through planning as one of the critical activities in the operations process. Many engineer activities also require critical reasoning, technical skills, and problem-solving techniques that form the base logic for the planning process (see ADRP 5-0). Engineer operations involve using some functionally unique analytic tools to aid with construction, design, facility, and other engineer-specific problems.

**JOINT PLANNING**

2-5. Joint planning is focused at the strategic and operational levels of war. While corps and below Army units normally conduct Army tactical planning, Army forces frequently participate in or conduct joint operations planning (for example, Army Service component commands [ASCCs] routinely participate in joint operation planning, including, the development of plans as the joint force land component. Corps and divisions perform joint operations planning when serving as a JTF or headquarters of Army forces. Corps, divisions, and brigades directly subordinate to a JTF participate in joint operations planning and receive joint orders. It is important that Army leaders serving in headquarters above the battalion understand the joint planning process and are familiar with the joint format for plans and orders. Joint operation planning uses contingency and crisis action planning. (See JP 3-33 and JP 5-0 for more information on joint operations planning.)

2-6. The primary joint doctrine publication for planning engineer operations is JP 3-34. Army planners should understand that the Air Force and Navy have a narrower focus for the engineer mission and consider general engineering to be primarily a logistics function that is executed to sustain forces in a contingency operation. Air Force and Navy activities tend to focus primarily on missions (such as base camp and life support development and construction and repair of seaports of debarkation, aerial ports of debarkation, and other facilities and sites rather than on operational support to ground maneuver forces). Naval construction force bridging provided in support of maneuver forces is an exception.

2-7. In joint operation planning, engineers should consider the—
- Identification of the JTF engineer.
- Receipt of engineering policy and guidance from the geographic combatant command (GCC) engineer.
- Establishment of a joint civil-military engineering board (JCMEB) and joint facilities utilization board and the impact of these boards on engineer operations.
- Establishment of traffic regulations that are dictated by the physical conditions of routes and communications.
- Identification of engineer support for collecting and processing information for map preparation and revision.
- Plans for future engineer requirements.
- Requirements for real estate, existing facility use, inter-Service support, and construction.
- Receipt of tasks for area damage control missions (for example, airfield damage repair).
- Establishment, issuance, and execution of the JTF environmental management support plan by the JTF engineer and the impact of this plan on engineer operations.
- Response time for engineer units with the desired capabilities.
- HN engineer support available and the language and cultural barriers.
- Class IV supplies (construction and barrier) available and the responsibilities of the JTF engineer concerning Class IV supply acquisition and management.
Component responsibilities for engineer support.
Contract construction support and contractor management.

2-8. Joint engineer activities and considerations are similar during contingency and crisis action planning processes. (See JP 5-0 for additional information about the deliberate planning and crisis action planning processes.) The engineer support plan (ESP) is produced by a joint engineer staff to be provided as input to a joint operation plan as part of the planning process. The ESP ensures that essential engineer capabilities are identified and provided at the required locations and times. This is the most critical appendix for engineering in a joint operation plan. For joint operations, engineers prepare the ESP and provide significant input to other annexes due to their possible impact on engineer operations as shown in JP 3-34.

2-9. Engineer planning is an integral part of joint operation planning. The ESP identifies the minimum-essential facilities and engineering capabilities needed to support the commitment of military forces. Based on Service component input, commanders are responsible for ESP preparation. (See appendix A for a sample ESP.) When preparing input for an ESP, joint engineer planners consider the—
- HN restrictions on bases and installations.
- Assumptions on the availability of critical HN support.
- Allocation of major construction resources.
- Sustainment of Class IV supplies. (The ESP should include considerations for Class IV supplies to be contracted locally instead of shipped from other sources.)
- Desired standards of construction (initial or temporary).
- Provision for force withdrawal (such as base denial and movement of relocatable residual assets).

2-10. The Global Combat Support System–Army is a tool used to support the quantitative aspects of engineer support planning and execution. It provides the general requirements for the ESP and provides a common automated system for the joint force engineer planners to determine the appropriate amount of engineer assets and capabilities needed to support the selected COA. Global Combat Support System–Army is a Web-based application on the Secret Internet Protocol Router Network (SIPRNET). The Global Combat Support System–Army assists engineer planners in determining the correct engineer capability for the location and the correctly timed capability to support the concept of operations. The Global Combat Support System–Army includes a theater construction management system module to assist with facilities planning and links into construction resource and materials planning. It also includes an environmental module. The Global Combat Support System–Army is used to—
- Generate time-phased facility requirements based on the operation plan.
- Analyze and assess engineer support by comparing facility requirements to in-theater facility assets and HN, contract, and troop engineering capabilities.
- Provide facility feasibility assessment, manpower, material, and nonunit cargo requirements for other processes.
- Provide infrastructure data to assist in mission analysis and COA development.
- Provide real-time monitoring capabilities that are necessary for tracking plan execution.

STAFF INTEGRATION

2-11. While staffs differ by echelon and unit type, all staffs include similar staff sections. Staffs consist of the chief of staff or executive officer and coordinating, special, and personal staff sections. Commanders organize the staff into command posts for operations. Commanders organize their headquarters into command posts to help exercise mission command throughout operations. By organizing the mission command system into command posts, commanders disperse their staff and mission command capabilities throughout the AO. This expands the commander’s ability to exercise mission command and makes the mission command system more survivable. The number and internal structure of command posts are based on available resources, planning horizons, and warfighting functions.

2-12. Doctrine and the unit modified table of organization and equipment provide commanders with a starting point for organizing engineer staff. Each operation is unique and is based on mission variables. Just as commanders organize their entire force for an operation, they organize their staff and other control systems for effective mission command. Mission variables are considered in determining the operational
configuration for the headquarters. The mission also determines which activities the operationally configured headquarters must accomplish. These activities determine how commanders organize, tailor, or adapt their staff to accomplish the mission. The mission also determines the staff size and composition (for example, a division headquarters may serve as the base for a JTF headquarters). Based on the analysis of mission variables, the division staff would be augmented with additional staff members and mission command capabilities to accomplish the JTF mission.

GEOSPATIAL SUPPORT AND JOINT ENGINEER STAFF

2-13. The joint force command has a unique engineer staff structure. The specific joint manning document describes the engineer staff organization and should reflect representation from each Service. Staff engineers should work closely with civilian and multinational partner organizations to develop wartime organization augmentation manning. The joint manning document should be built based on mission analysis and the engineer staff capabilities required to support the operation.

2-14. The joint force commander organizes the staff to carry out assigned duties and responsibilities. Based on mission-specific requirements, the engineer staff may be placed within the operations directorate of a joint staff (J-3) or logistics directorate of a joint staff (J-4) or be organized as a separate staff to the joint force commander. The joint force commander may choose to organize geospatial engineers or geospatial information and services officers within the intelligence directorate of a joint staff (J-2), J-3, J-4, or engineering staff section of a joint staff (J-7), depending on the specific organizational structure of the unit. Considerations for each option include the following:

- **J-3.** When the focus of engineer effort predominantly supports operational movement and maneuver, fires, and protection warfighting functions, the joint force commander should consider placing the engineer staff as a cell within the J-3. This option provides the fastest exchange of information during crisis action planning and optimizes the use of supporting capabilities.

- **J-4.** When the engineer effort predominantly supports the sustainment of the joint force, the joint force commander should consider placing the engineer staff as a cell within the J-4. This option facilitates planning and coordination among engineers and logisticians for the construction and repair of lines of communication, main supply routes, airfields, other logistics facilities, and infrastructure in general.

- **J-7.** When the engineer effort is a significant focus or a key element of the joint operation or where the engineer effort is equally divided between combat and general engineering disciplines, the joint force commander should consider establishing a J-7 element that reports directly to the joint force commander. This option provides the greatest flexibility in arranging for diverse engineer operations, and it provides the greatest visibility of engineer capabilities, requirements, and responsibilities. This is the preferred option.

Geospatial

2-15. Within Army forces, geospatial capabilities are distributed at the BCT, division, corps, and theater Army echelons to provide geospatial engineering support. Geospatial engineering support provided to the Army and other Services varies in focus at each echelon. It is focused on geospatial data generation, geospatial data analysis, geospatial data management, and quality control at the theater Army and combatant command level. At the corps and division levels, the most workload is required to support database management, mission planning, and the intelligence preparation of the battlefield. Below the division level, geospatial engineering is increasingly focused on supporting current operations and updating the geospatial database (database management).

2-16. The corps and division team and the geospatial intelligence cell, if available, support the assistant chief of staff, intelligence (G-2) and the assistant chief of staff, operations (G-3) planners to fuse intelligence and geospatial information into a common picture for the commander, staff, and subordinate units. The geospatial engineering team requires access to the classified tactical network to update and disseminate geospatial information and products. The geospatial engineering team that is organic to the corps and division collects and provides updated geospatial data and products in support of corps and division operations.
2-17. A geospatial planning cell is assigned to each Army command to provide geospatial operational planning; the generation, analysis, and preparation of maps; map updates; tactical decision aids; and coordination with other geospatial engineering elements and higher headquarters. Geospatial planning cells are the only units within the Army force structure that have a unique, dedicated geospatial data generation capability. The geospatial planning cell requires access to the global information grid and a classified, tactical local area network to update and disseminate geospatial information and products.

2-18. The National-Geospatial Intelligence Agency produces digital terrain and feature data, which is available to users via the Internet or directly from the National-Geospatial Intelligence Agency. The Defense Logistics Agency distributes maps. Geospatial engineers can request imagery, which can be used for spatial and temporal reasoning or multispectral analysis products that are customized to meet particular operational requirements. Imagery enhances three-dimensional and fly-through perspectives. National-Geospatial Intelligence Agency analysts may be attached to units, normally at the division level and above, to supplement organic geospatial engineers and staffs.

Joint Engineer Staff

2-19. A combatant command engineer staff assists the GCC by performing a variety of functions to synchronize engineer operations in the area of responsibility. A joint force engineer serves as the principal advisor to the joint force commander for matters that pertain to the planning and execution of joint engineer support operations. The GCC and subordinate joint force commander organize their staffs to carry out their assigned duties and responsibilities. When a functional component command employs forces from more than one Service, the staff should reflect each Service represented. Based on mission-specific requirements, the engineer staff may be placed within the J-3 or J-4 or organized as a separate staff to the joint force commander. The joint force commander may choose to organize geospatial engineers or geospatial information and services officers within the J-2. Regardless of the option or combination of options used, the requirement for the staff engineer and the need for constant communication, liaison, and coordination throughout the entire staff remains. (See figure 2-1 for the organization of a notional engineer staff.)

![Figure 2-1. Example of a notional joint engineer staff](image)

Legend:

GI&S: geospatial information and service

2-20. Typical joint engineer responsibilities are to—
- Plan and coordinate theater engineer support.
- Provide recommendations on the assignment of engineering missions to subordinate commanders. (Recommendations may include which subordinate commander [Service or functional component,
subordinate JTF, or subunified commander] is assigned the mission or the scope of the project and which commanders are placed in supporting roles.)

- Provide recommendations on the tasking of components for theater engineering missions, tasks, or projects.
- Recommend policies and priorities for construction and real estate acquisition and Class IV construction materials.
- Compile a joint, integrated priority list for construction projects for U.S.-funded contingency construction and HN-funded construction.
- Provide advice on the effects of joint operations on the physical environment according to applicable U.S., international, and HN laws and agreements.
- Recommend construction standards.
- Identify the engineer support requirements that exceed component funding authorizations and organized engineer capabilities.
- Advise on the mission risk assessment and engineer support shortfalls.
- Advise on the feasibility, acceptability, and suitability of component engineering plans.
- Prepare the engineer parts of operation plans and operation orders, as part of the joint operation planning process.
- Review engineer-related annexes and appendixes of operation plans and operation orders.
- Provide input to the theater security cooperation plan. (Develop and program construction projects, including an exercise-related construction program and humanitarian and civic assistance program construction projects to support theater security cooperation strategies.)
- Develop training and exercise programs to evaluate and improve preparedness for engineering missions.
- Plan and coordinate the procurement and distribution of Class IV construction material based on the established priorities. (Service components are responsible for the procurement and distribution of the Class IV requirements.)
- Coordinate with DOD and Department of State construction agents and other engineer support agencies.
- Participate in joint engineering boards and engineer-related working groups as required.

2-21. Key joint engineer staff functions are to—

- Develop and coordinate combat, general, and geospatial engineering requirements for the joint force.
- Act as the intermediary, facilitator, and coordinator between JTF elements (including nonmilitary elements) requesting engineering services.
- Receive guidance and report actions to the JCMEB.
- Develop and coordinate tasks for component engineer forces.
- Coordinate and facilitate the joint facilities utilization board, JCMEB, and joint environmental management board. Integrate actions from these boards, assign tasks based on board recommendations, and monitor completion.
- Screen, validate, and prioritize engineering projects and mission assignments. Participate in the Army Logistics Civil Augmentation Program management to validate operations and maintenance services and construction requirements.
- Plan, program, and control facility utilization.
- Receive guidance and report actions to the joint facilities utilization board.
- Prepare logistics reports on engineer resources using the Joint Operation Planning and Execution System.
- Develop the ESP.
- Plan and coordinate the distribution of construction and barrier materials and engineer munitions based on the established priorities.
- Participate on the joint acquisition review board to validate requests for construction equipment leases and purchases.
- Function as the primary interface between the joint force, HN, and other theater construction organizations.
- Establish lead Service engineer contract support that requires activity responsibilities (including the development of statements of work and contracting officer representative nomination and management tasks).
- Plan and provide guidance for environmental considerations that impact joint operations (the impact of international and HN environmental legal requirements on operations, required environmental surveys and documentation, planning and reporting for spill response).
- Serve as the program manager for engineer-related functions.

2-22. *Force projection* is the ability to project the military instrument of national power from the United States or another theater, in response to requirements for military operations (JP 3-0). Force projection operations extend from the mobilization and deployment of forces, to the redeployment of forces, to the continental United States or home theater (see JP 3-35).

2-23. Engineer force units and individual augmentees must be requested through the request-for-forces process to meet force projection requirements. Engineer staffs at the GCC and theater Army headquarters are primary points of contact to initiate a request for engineering forces as part of force tailoring. Subordinate commanders may forward requests to the theater Army echelon. Once validated, the request is forwarded to the combatant commander and then to the joint staff for sourcing. (See JP 1-0 for more information on requests for forces.)

**PLANS AND ORDERS**

2-24. Plans and orders are key tools used by commanders, with staff assistance, in directing operations (including engineer operations). Engineer operations typically require direction in the plans and orders of the supported combined arms headquarters and the controlling engineer unit headquarters. The engineer staff assists combined arms commanders with input to the mission orders that direct supporting engineer operations. Engineer staff planners collaborate with mission-tailored engineer headquarters commanders and staffs for using plans and orders to direct engineer unit operations. The interaction with joint operations planning increases at higher echelons. EAB echelon engineer planners frequently draw on and use the ESP. (See ADP 5-0 for a detailed discussion of order formats.)

2-25. Commanders issue plans and orders to subordinates to communicate their visualization of an operation. Plans and orders—
- Summarize the situation (current conditions) and describe the end state of an operation. Effective plans focus on the results that commanders expect to achieve rather than how to achieve them.
- Convey the unit mission, commander’s intent, and concept of operations (sequences forces in time, space, and purpose to accomplish the mission and achieve the operation end state) and serve as guides for coordinating the force during execution.
- Task-organize the force.
- Allocate resources.
- Assign tasks to subordinate units.
- Vary in scope, complexity, and length.

2-26. A concept of sustainment and mission command complete the base plan or order. Details regarding the situation and instructions necessary to synchronize the force are contained in annexes. (ADP 5-0 provides the format for Army plans and orders. The format for joint plans and orders is in JP 5-0.) Plans and orders can include operation plans, concept plans (with or without time-phased force and deployment data), operation orders (the format must be usable at all echelons and in all situations), service support orders, warning orders, and fragmentary orders.

2-27. Strategic plans cover the overall conduct of a war or crisis from a national perspective. Operational and campaign plans cover a series of related military operations that are aimed at accomplishing strategic and operational objectives within an area of responsibility or a joint operations area (JOA). Tactical plans cover the employment of corps level and lower units in operations. Tactical plans and orders also vary greatly. A division operation order that covers a 12-month operation and a rifle platoon operation order for an ambush
patrol are significantly different in scope, complexity, and length of planning horizon. While each type of plan or order serves a particular purpose, they all follow the basic five-paragraph format of—

- Situation.
- Mission.
- Execution.
- Administration and logistics (service support).
- Mission command.

**Engineer Support Plan**

2-28. Joint interdependence requires that higher headquarters understand joint planning doctrine. An Army force headquarters must be prepared to serve as the Army component of a joint force. An Army division or corps headquarters may serve as the base for a JTF headquarters. Engineer staff and engineer organizations supporting these headquarters participate in joint planning and must understand the ESP. The ESP is produced by a joint engineer staff for input to a joint operation plan as part of the planning process. It ensures that essential engineering capabilities are identified and provided at the required locations and times. It is the most critical appendix for engineering in a joint operation plan.

2-29. The Global Combat Support System–Army is a tool that is used to support quantitative aspects of engineer support planning and execution. It provides the general ESP requirements and provides a common automated system for joint force engineer planners to determine the appropriate amount of engineer assets and capabilities required to support the selected COA. The Global Combat Support System–Army assists engineer planners in determining the correct engineer capability for the proper location and ensures that it is timed correctly to support the concept of operations. The Global Combat Support System–Army includes a theater construction management system module to assist with facilities planning and link construction resources and materials planning. It also includes an environmental module. The Global Combat Support System–Army is used to—

- Generate time-phased facility requirements based on the operation plan.
- Analyze and assess engineer support by comparing facility requirements to in-theater facility assets and HN, contract, and troop engineering capabilities.
- Provide facility feasibility assessment, manpower, material, and nonunit cargo requirements for other processes.
- Provide infrastructure data to assist in mission analysis and COA development.
- Provide real-time monitoring capabilities that are needed to track plan execution.

**Engineer Unit Sustainment Support**

2-30. Army transformation into an expeditionary campaign quality force includes significant changes in the structure and systems that provide logistics and other sustainment support. One key feature is a logistics system that relies on asset visibility and flexibility instead of mass. Within the transformed framework, distributed support and sustainment are keys to maintaining freedom of action with the smallest feasible deployed logistics footprint. Support planning and execution must be closely integrated into tactical and operational battle rhythms. Successful engineer operations include effective incorporation of sustainment support. Sustainment for engineer elements includes the functions of—

- Supply.
- Field services.
- Transportation.
- Maintenance.
- Explosive ordnance disposal.
- Health service support.
- Human resources support.
- Financial management support.
- Legal support.
- Religious support.
- Band support.

2-31. For units augmenting BCT engineers and other units operating at EAB, integration into an area or theater support structure is required. This manual focuses on sustainment support for engineer capabilities and highlights the sustainment considerations that affect engineer operations. (See ADP 4-0 for more information on sustainment support.)

2-32. Engineers operating above the BCT level work closely with, and receive sustainment support, from the sustainment brigade. A sustainment brigade is one type of support brigade, and it is subordinate to the theater support command. Sustainment brigades consolidate selected functions previously performed by corps and division support commands and area support groups into a single operational echelon. Sustainment brigades provide mission command of the full range of logistics operations conducted at the operational (theater) or tactical (corps and division) levels. Sustainment brigades perform theater opening, distribution, and sustainment functions. Each of these functions is interrelated, and throughout the course of an operation, a sustainment brigade likely performs one or more of these functions simultaneously.

2-33. Engineer staff and commanders are essential to the sustainment of engineer organizations and capabilities operating at every echelon. The sustainment of engineer units and capabilities organic, assigned, or attached to a supported unit is the responsibility of the leaders and staff of the unit that they support; but the higher-echelon engineer staff officer will retain an interest in the status of engineer unit support. The engineer staff officer must work closely with the supported unit logistics staff to assist in planning, preparing, executing, and assessing operations, which will most likely require extensive engineer materials and resources. When engineer or multifunctional modular headquarters units are provided, the organic logistics staff within that headquarters provides sustainment planning for the engineer force under its mission command. Engineer battalions provide logistics support to subordinate units through organic forward support companies.

COMBINED ARMS INTEGRATION

2-34. Combat power is the actual application of force and the conversion of fighting potential into effective action. It includes the constructive and information capabilities of the unit and the disruptive or destructive force. Engineer operations contribute significant combat power (lethal and nonlethal in nature) to all elements of decisive action.

2-35. Combined arms is the synchronized and simultaneous application of arms to achieve an effect greater than if each arm was used separately or sequentially (ADRP 3-0). Engineer forces and capabilities are widely distributed throughout the combined arms force. Command and support relationships vary at every echelon and within echelons among forces who conduct various operations. In every case, the engineer effort is integrated into the combined arms application and coordinated to support the combined arms objective.

MISSION COMMAND OF ENGINEER FORCES

2-36. Mission command of engineers consists of the following distinct but interrelated functions:
- Command of engineer forces conducting operations.
- Staff control of critical asset activities to the supported commander’s mission.

2-37. Engineer units must execute mission command and the operations process activities required to conduct unit operations. Many engineer units will interact with mission command activities and supported unit operations. The interaction may be primarily through an engineer staff assigned to the supported unit or through staff counterparts. In some cases, a supported unit may not have an assigned engineer staff and the supporting unit will provide this support. A supported unit has an assigned engineer EAB staff at division, corps, and theater Army headquarters. The engineer staff at these headquarters aid commanders with the control of engineer forces by establishing control mechanisms and shaping the command and support relationships of the tailored force.
WORKING GROUPS, BOARDS, AND CELLS

2-38. Commanders at each echelon may establish working groups, boards, or cells to manage and coordinate functional or multifunctional activities:

- **Working groups.** Working groups conduct staff coordination at the action officer level and prepare materials for decisions to be made at a board.
- **Boards.** Boards establish policies, procedures, priorities, and oversight to coordinate for efficient resource use.
- **Cells.** Cells group personnel from various sections on a headquarters authorization document to integrate key functions (such as cells focused on each warfighting function).

2-39. The engineer staff are key members on many of these and may chair construction-related groups. (See FM 6-0 for more information on working groups, boards, and cells.)

2-40. The geospatial engineering units available to the commander may become part of the geospatial intelligence cell of the command. The geospatial intelligence cell is composed of the people and capabilities that constitute the geospatial intelligence support (imagery and geospatial assets). The cell ensures that geospatial intelligence requirements are coordinated through the appropriate channels as applicable and facilitates shared access of various domains. This cell may be centrally located or distributed throughout the command and connected by networks. Cell members do not have to work directly for a designated geospatial intelligence officer. They may work for their parent unit but coordinate efforts across staff directorates. The key to a successful process is collaboration across functional areas within the command and between the geospatial intelligence cell, higher headquarters, and other stakeholders.

COMMAND AND SUPPORT RELATIONSHIPS

2-41. The ASCC is the primary vehicle for Army support to Army, joint, interagency, and multinational forces operating across the combatant commander’s area of responsibility. When the GCC acts as the joint force commander during major combat operations, the ASCC may provide the JFLCC and headquarters. In that case, it exercises operational control (OPCON) over land forces deployed to a JOA. The ASCC headquarters continues to perform area of responsibility-wide ASCC functions (joint reception, staging, onward movement, and integration; joint logistics over the shore; joint sustainment area coordinator).

2-42. *Administrative control* is the direction or exercise of authority over subordinate or other organizations in respect to administration and support (JP 1). Administrative control is closely associated with command relationships; however, joint doctrine does not classify it as a command relationship. Administrative control of Army forces is exercised through the administrative branch of the chain of command. For units operating at the tactical level (division, brigade, and below), the normal operational chain of command is followed. When Army forces are attached to a combatant command, the administrative chain of command switches from the parent Army command, ASCC, or direct reporting unit to the receiving headquarters through the gaining ASCC. The gaining ASCC and parent command specify administrative control responsibilities retained by the parent command. Unless modified by higher headquarters, the release from attachment returns administrative control responsibilities to the parent headquarters.

2-43. Army command and support relationships allow flexibility in allocating Army capabilities among various echelons. ADRP 3-0 lists responsibilities inherent in the Army command and support relationships. Command and support relationships are the basis for building task organizations. Command relationships define superior and subordinate relationships between unit commanders. Command relationships identify the degree of control of the gaining or supported commander. The type of command relationship often relates to the expected longevity of the relationship between the headquarters involved.
2-44. Commanders establish support relationships when the subordination of one unit to another unit is inappropriate. They assign a support relationship when—

- The support is more effective when the supporting unit is controlled by a commander with the requisite technical and tactical expertise.
- The echelon of the supporting unit is the same as, or higher than, that of the supported unit. For example, the supporting unit may be a brigade and the supported unit may be a battalion). It would be inappropriate for the brigade to be subordinate to the battalion, so an Army support relationship is used.
- The supporting unit supports several units simultaneously. The requirement exists to set support priorities to allocate resources to supported units. Assigning support relationships is one aspect of mission command.
- The supporting unit special authorities and warrants are linked to its parent command. For example, contract construction acquisition and contract award authorities are with the USACE commanding general, and USACE divisions and districts are retained under USACE command.

2-45. Experience has generally shown that command relationships work well in offensive operations, but that support relationships allow for the efficient use of high-demand, low-density engineering capabilities during defensive and stability operations. However, each situation is unique and requires careful analysis in determining the appropriate relationship of engineers to the supported force.

2-46. Several other relationships established by higher headquarters exist with units that are not in command or support relationships (see ADRP 3-0). These relationships are limited or specialized to a greater degree than the command and support relationships. These limited relationships are not used when tailoring or task-organizing Army forces. The use of these specialized relationships helps clarify certain aspects of OPCON or administrative control.

2-47. A subordinate joint force commander normally exercises OPCON over assigned or attached forces and is responsible for the employment of their capabilities to accomplish the assigned mission or objective. Additionally, the joint force commander ensures that cross-Service support is provided and that all engineering forces operate as an effective, mutually supporting team. The joint force commander assigns engineering tasks to subordinate commanders. Most often, joint forces are organized with a combination of Service and functional component commands (see FM 3-34 and JP 3-34).

2-48. Some operations (such as disaster relief or foreign humanitarian assistance) are engineer-intensive. In such cases, the joint force commander may opt to establish a subordinate JTF to control extensive engineer operations and missions. Such a JTF may be formed around an existing TEC, engineer brigade, MEB, or naval construction regiment. The joint force commander designates the military engineer capabilities that will be made available for tasking and the appropriate command relationships. Engineer forces could be placed under OPCON, under tactical control, or in a direct support or general support role depending on the degree of control that the joint force commander desires to delegate to the subordinate JTF. The engineer assets attached to the subordinate JTF normally consist of a mix of engineer assets drawn from the engineer resources of the entire force. If the subordinate JTF is to provide a common support capability, it will require a specific delegation of directive authority from the GCC for the common support capability that is to be provided.
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Chapter 3
Theater Army Engineer

Each theater Army is designed to exercise mission command over land power in support of a GCC. The theater Army headquarters structure is designed to provide its commander with the maximum flexibility needed to meet the requirements to serve as a Title 10, United States Code (10 USC) provider and as an operational commander. Even when configured with OPCON responsibilities, the theater Army retains administrative and support functions that it must perform throughout the region. This chapter focuses on engineer operations at the theater Army echelon and in support of both requirements.

INTEGRATION

3-1. The theater Army engineer provides a focus on the relationship of the physical environment and infrastructure to Army design methods. Other relevant information gained from the engineer analysis of the operational environment assists the commander in framing and reframing the problem, formulating the design, and refining the design. Operational engineer concepts are synchronized with, and expressed through, the framework of Army design methods (see ADRP 5-0). Unified action partners (Department of State, U.S. Agency for International Development) must be considered for those tasks in which Service engineers do not have the capability or capacity to perform.

THEATER PERSPECTIVE

3-2. The echelons of command perceive differing requirements and constraints associated with command at each level of war. Between the levels of war, the horizons for planning, preparation, and execution are vastly different. Operational commanders typically orchestrate the activities of the military and other U.S. governmental organizations across large areas and across the range of military operations. Operational commanders seek to create the most favorable conditions possible for subordinate commanders by shaping future events. The theater Army echelon maintains a broad perspective typically considering simultaneous major operations across the range of military operations and throughout the theater. Theater Army echelon engineers view a similarly broad perspective of challenges and opportunities, considering the range of military operations from peacetime military engagement to major combat operations and the various administrative and support functions required throughout theater.

3-3. At the theater Army echelon, the engineer staff assists in translating broad Army design method into a coherent, feasible concept for employing forces. The engineer examines the functional and multifunctional mobilization, deployment, employment, and sustainment requirements of the concept of operations. From the operational perspective, those requirements will typically include reception, staging, onward movement, and integration, construction, real estate, and other general engineering support through the sustainment and protection warfighting functions. The operational perspective also includes initially shaping the combat and general engineering capabilities most favorable for each subordinate echelon. Geospatial information and terrain analysis provides the foundation on which understanding the physical environment is based.

3-4. As Army design methods develop, the theater engineer collaborates with subordinate echelon engineers to identify and refine requirements for general and combat engineering support linked to the movement and maneuver and protection warfighting functions. The theater engineer must also ensure that adequate geospatial engineering support is provided for intelligence and mission command at each echelon.
Communication enables collaboration, which continues throughout the operations process. To facilitate collaboration with engineer unit commanders and other unit engineer staff, each seeks to—

- Understand the higher commander’s intent and planning guidance.
- Analyze the physical environment and have extensive knowledge of the terrain and geospatial products available, obstacle information, and threat capabilities.
- Know the engineer systems and capabilities needed to accomplish identified tasks and the time required.
- Identify risks where engineer capabilities are limited or time is short and identify methods to mitigate the risks (including leveraging reachback capabilities).
- Consider the depth of the AO and the impact of potentially simultaneous operational elements. Include the integration of environmental considerations.
- Plan for the sustainment of engineer operations.
- Ensure that logistics requirements (with special emphasis on engineer resources) are analyzed and accounted for to the end state of the operation so that future operations are facilitated.

3-5. The theater engineer running estimate provides a working compilation of relevant information that is primarily focused on the physical environment while comprehensively accounting for engineer units, capabilities, and other resources. The running estimate is built from initial assessments framed by the operational or mission variables. The operational running estimate evolves with Army design methods. The relevant information contained in the theater engineer running estimate logically connects each identified challenge or opportunity to an operational requirement. The running estimate can be organized by engineer discipline and warfighting function, as are the requirements shown in figure 3-1. The running estimate is continuously refined and updated as additional assessments are made, guidance and priorities are established, and feedback is gathered.

![Figure 3-1. Theater echelon engineer requirements by discipline](image)

3-6. Engineer operations act as one of many key enablers as the theater Army commander drives Army design methods to shape the conditions for tasks and objectives to achieve the military end state. To be
effective as an enabler, the engineer staff must be integrated in the effort to assist the commander in framing and reframing the problem, formulating the design, and refining the design. Engineer disciplines assist in organizing capabilities, warfighting functions synchronize engineers with other enablers, and the elements of Army design methods provide a framework for expressing design concepts. The theater engineer staff integrates these efforts through the operations process to identify the specific engineer operational approach for the theater or JOA and develop the refined operational concept.

OPERATIONS

3-7. The theater Army echelon typically conducts a number of operations simultaneously throughout the area of responsibility. Throughout the area of responsibility, the theater Army headquarters could be required to conduct or support multiple activities in a designated AO. In each case, the commander and staff use the operations process activities to conduct the operations. Theater Army echelon commanders use Army design methods to help understand and describe the operational environment, frame the problem, and shape and refine COAs. The resulting concept of operations forms the basis for developing the detailed campaign, operation plan, or operation order. During execution, commanders and staffs assess the situation considering design elements and adjust current and future operations and plans as the operation unfolds.

3-8. Engineer operations are typically resource- and time-intensive. The theater Army engineer perspective offers an extended planning horizon as an opportunity available at the operational level. To seize the opportunity, some initial decisionmaking is necessary even as the concept of operations develops. The commander’s visualization provides an initial concept of operations. This planning guidance is a reflection of how the commander envisions the operation unfolding. It provides a broad description of when, where, and how the commander intends to employ combat power within the higher commander’s intent. Planning guidance also contains priorities for each warfighting function.

3-9. The theater Army engineer seeks to exploit an extended operational planning horizon by prioritizing the need for the commander’s decisions and shaping selected aspects of the operation as early as possible (for example, the provision of contingency basing and facilities for aviation capabilities can require extensive design and construction resources). Even if abundant design and construction capabilities are available, which would be a rare circumstance, an extensive amount of time may still be required to complete the effort. In this case, the operational engineer seeks to confirm the commander’s priority for the project and obtain the decisions on project location and design. With these initial decisions, the engineer effort can move to preparation and execution while operational planning continues.

3-10. For the theater Army engineer staff, the cyclic activities of the operations process are continuous and simultaneous. These activities will overlap and recur as circumstances demand. Assessment enables planning, which further enables assessment. In many cases, engineering preparations occur as operational planning is conducted. The execution of selected engineer operations usually precedes operational execution, and operational assessments generate additional engineer requirements. While the engineer staff will be cycling the selected activities demanded by engineer requirements, they must remain synchronized with their staff counterparts in the broader operations process.

PLANNING

3-11. The combatant commander plans joint operations based on the analysis of national strategic objectives and the development of theater strategic objectives supported by measurable strategic and operational desired effects. At the operational level, a subordinate joint force commander develops supporting plans, which can include objectives supported by measurable effects. Joint interdependence requires that the theater Army headquarters understand the doctrine that addresses joint planning techniques. For the theater echelon engineer, operational planning merges the engineer plan of the joint force, the specific engineer missions assigned, and the available engineer forces to support Army design methods of the theater Army commander.

3-12. Informed by their analysis of the operational environment, operational engineer planners assist in defining an AO, estimating forces required, and evaluating requirements for the operation. They use the commander’s intent to develop and refine COAs that contribute to setting the conditions in the AO that support the end state. They maintain a broad focus and seek to exploit the extended planning horizon. As units are identified to participate in the operation, they collaborate as fully as possible to gain depth for their
3-13. The military decisionmaking process (MDMP) serves as the primary tool for Army operational planning. Operational engineer planners participate with their staff counterparts in the process to translate the commander’s visualization into a specific COA for preparation and execution. The theater Army echelon engineers collaborate closely with their counterparts in the GCC joint engineer staff throughout the MDMP to develop a shared understanding of the mission. Theater level engineers use the joint operations planning Process vice the Army MDMP. As the plan develops, engineer planners remain synchronized with theater Army staff counterparts through warfighting functions as shown in table 3-1.

Table 3-1. Planning integrated across warfighting functions

<table>
<thead>
<tr>
<th>Warfighting Function</th>
<th>Engineer Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement and maneuver:</td>
<td>Analyze infrastructure and terrain to support operational deployment and movement.</td>
</tr>
<tr>
<td>• Deploy.</td>
<td>• Evaluate mobility and countermobility requirements to preserve operational freedom of maneuver (clearance, crossing, and marking considerations).</td>
</tr>
<tr>
<td>• Move.</td>
<td>• Develop engineer force and capability estimates.</td>
</tr>
<tr>
<td>• Maneuver.</td>
<td>• Consider infrastructure improvements, reconstruction, and other nonlethal applications for stability or DSCA operations.</td>
</tr>
<tr>
<td>• Conduct direct fires.</td>
<td>• Analyze infrastructure and terrain to support operational deployment and movement.</td>
</tr>
<tr>
<td>• Occupy an area.</td>
<td>• Evaluate mobility and countermobility requirements to preserve operational freedom of maneuver (clearance, crossing, and marking considerations).</td>
</tr>
<tr>
<td>• Conduct mobility and countermobility.</td>
<td>• Develop engineer force and capability estimates.</td>
</tr>
<tr>
<td>• Provide battlefield obscuration.</td>
<td>• Consider infrastructure improvements, reconstruction, and other nonlethal applications for stability or DSCA operations.</td>
</tr>
<tr>
<td>Intelligence:</td>
<td>Identify requirements for geospatial information. Coordinate to provide the necessary terrain analysis, products, and other support.</td>
</tr>
<tr>
<td>• Support force generation.</td>
<td>• Estimate threat engineer capabilities.</td>
</tr>
<tr>
<td>• Support situational understanding.</td>
<td>• Gather and coordinate for obstacle information.</td>
</tr>
<tr>
<td>• Conduct information.</td>
<td>• Disseminate specific EH, hazmat, or other recognition and warning information.</td>
</tr>
<tr>
<td>• Provide intelligence support to targeting and information operations capabilities.</td>
<td>• Coordinate for engineer assessments and surveys for technical information requirements.</td>
</tr>
<tr>
<td>Fires:</td>
<td>Plan for the survivability of key fires assets.</td>
</tr>
<tr>
<td>• Deliver fires.</td>
<td>• Participate in the targeting process (includes identification of impacts to key infrastructure).</td>
</tr>
<tr>
<td>• Conduct targeting.</td>
<td>• Coordinate for command guidance on the employment of scatterable mines and other munitions.</td>
</tr>
<tr>
<td>• Integrate all forms of Army, joint, and multinational fires.</td>
<td>Develop base development and support estimates.</td>
</tr>
<tr>
<td>Sustainment:</td>
<td>• Estimate real estate and other facility engineer support.</td>
</tr>
<tr>
<td>• Provide logistics.</td>
<td>• Identify lines of communication and other key routes, and determine support requirements for establishing and maintaining distribution system.</td>
</tr>
<tr>
<td>• Provide personnel services.</td>
<td>• Identify potential sources of construction equipment and materials.</td>
</tr>
<tr>
<td>• Provide health service support.</td>
<td>• Identify contract construction requirements.</td>
</tr>
<tr>
<td></td>
<td>• Estimate area damage control and other construction support.</td>
</tr>
<tr>
<td></td>
<td>• Determine specialized engineer requirements (power, water, firefighting).</td>
</tr>
<tr>
<td></td>
<td>• Prepare construction and barrier material estimates.</td>
</tr>
<tr>
<td></td>
<td>• Prepare munitions estimates.</td>
</tr>
<tr>
<td></td>
<td>• Determine authorities, funding types, and levels of support.</td>
</tr>
</tbody>
</table>
Table 3-1. Planning integrated across warfighting functions (continued)

<table>
<thead>
<tr>
<th>Warfighting Function</th>
<th>Engineer Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission command:</td>
<td>• Coordinate for geospatial information, products, and analysis to enhance visualization of the OE, achieve situational understanding, and enable decisionmaking.</td>
</tr>
<tr>
<td>Execute the operations process.</td>
<td>• Establish and participate on boards, working groups, and cells.</td>
</tr>
<tr>
<td>Integrate the information superiority contributors.</td>
<td>• Recommend command and support relationships.</td>
</tr>
<tr>
<td>Conduct information engagement.</td>
<td>• Recommend control measures, priorities, standards, and reports.</td>
</tr>
<tr>
<td>Conduct CA operations.</td>
<td>• Recommend control measures, priorities, standards, and reports.</td>
</tr>
<tr>
<td>Integrate airspace control.</td>
<td>• Establish and maintain liaison.</td>
</tr>
<tr>
<td>Execute command programs.</td>
<td></td>
</tr>
</tbody>
</table>

| Protection: | • Evaluate base camp and other survivability requirements. |
| Coordinate air and missile defense. | • Consider facilities hardening. |
| Provide personnel recovery. | • Plan for area damage control. |
| Provide information protection. | • Investigate environmental impacts. |
| Provide fratricide avoidance. | • Conduct EH threat assessment and support. |
| Provide operational area security. | |
| Support antiterrorism operations. | |
| survivability. | |
| Provide force health protection. | |
| Support CBRN operations. | |
| Provide safety measures. | |
| Provide operations security. | |
| Support EOD. | |

Legend:

- CA civil affairs
- CBRN chemical, biological, radiological, and nuclear
- DSCA defense support of civil authorities
- EH explosive hazard
- EOD explosive ordnance disposal
- OE operational environment

3-14. As operational planning proceeds through MDMP, the engineer relies heavily on analytic techniques to guide functional problem solving. These techniques demand technical information, which may be available from existing assessments or may require additional assessments or surveys. Support available through reachback or through collaborative planning may be used to focus on technical details.

3-15. Control measures are established under the authority of a commander; however, staff officers and subordinate leaders can also establish them with the commander’s authorization. Aided by the engineer staff, theater Army commanders exercise control over engineer forces in the AO. Staffs provide their greatest support in providing control and keeping the commander informed. The following are some of the measures employed by the theater Army echelon engineer staff to provide control and keep the commander informed—

- Construction priorities, directives, and standards.
- Mobility, countermobility, and survivability support.
- Policies and procedures.
- Reporting requirements.
3-16. It is essential to establish priorities to determine the distribution of engineering capabilities and resources and to ensure the unity of effort toward achieving the theater commander’s intent. The theater engineer uses the engineer staff estimate developed during the planning process as a baseline for combat and general engineering. Initially, resources may only be assigned to the highest priority tasks that accomplish projects on the list. The theater commander issues directives for establishing a guide for the generally accepted four priority groups (vital, critical, essential, and necessary) that assign specific categories of work to each group (for example, area damage control of air base runways and critical communication facilities may be designated as vital and improvement to lines of communication may be designated as critical). Subordinate echelon organizations develop an integrated priority list of general engineering work based on the priority groups and the changing tactical situation.

3-17. The theater Army echelon engineer staff coordinates with their counterparts at the GCC to address construction standards in the area of responsibility or a designated AO. (See ATP 3-34.40 for more information on construction standards.)

3-18. The result of the MDMP is a plan or order, which provides subordinates the information they need for execution. Engineer planners provide input to the appropriate paragraphs, annexes, and appendixes for the joint or Army format. The operational engineer staff continues to collaborate and assist subordinate unit staffs with planning and coordination.

**Preparation**

3-19. Preparation consists of activities performed by the unit before execution to improve its ability to conduct the operation. Preparation requires staff, unit, and Soldier actions. Mission success depends as much on preparation as planning. A focus of operational engineer preparation activities is support to theater level engineer reception, staging, onward movement, and integration and the establishment of the sustainment base. Construction activities, real estate management, and facilities engineering are predominate during preparation. Operational engineer forces conduct a variety of construction and other technical preparation activities focused on the specific mission. Construction and technical preparation activities include—

- Completing and reviewing designs. In a design-build process, the design will typically be completed at a 10 to 30 percent resolution before execution.
- Conducting the necessary preconstruction studies or surveys.
- Identifying additional technical support required.
- Completing detailed planning activities not yet completed from the project management process (estimates, bills of materials, schedules).
- Preparing the construction site (staging equipment, stockpiling materials, completing temporary construction) as required.

3-20. Operational engineer preparations include addressing requirements for facilities and the mobility of forces (including the standards to be applied). The requirements should reflect the combat and general engineering support necessary for the expected duration and intensity of operations, be limited to the forces employed (including multinational, HN, and contractor), and be time-phased. Adequate funding must be available to undertake the early engineer reconnaissance and acquisition of facilities to meet requirements through construction or leasing. Facilities are grouped into six broad categories that emphasize using existing assets over new construction. To the maximum extent possible, facilities or real estate requirements should be met from these categories in the following priority order:

- **Priority 1.** U.S.-owned, occupied, or leased facilities (including captured facilities).
- **Priority 2.** U.S.-owned facility substitutes pre-positioned in the theater.
- **Priority 3.** HN and multinational support where an agreement exists for the HN or other nations to provide specific types and quantities of facilities at specified times in designated locations.
- **Priority 4.** Facilities available from commercial sources.
- **Priority 5.** U.S.-owned facility substitutes stored in the United States.
- **Priority 6.** Construction of facilities that are considered shortfalls after an assessment of the availability of existing assets.
3-21. At the operational level, preparation activities may include the establishment of working groups, cells, or boards as described in Appendix B to solve problems and coordinate actions. Theater Army echelon construction operations may be managed by a theater or regional contingency engineering management cell. The composition and procedures of theater and regional contingency engineering management cells are governed by the respective GCCs. These cells are augmented by the staffs they support. The theater and regional contingency engineering management cells apply the commander’s intent, merge engineer support requirements, and orchestrate resources by—

- Establishing priorities and policy for theater construction and barrier materials.
- Establishing theater distribution protocols that are consistent with construction priorities.
- Monitoring and recommending the allocation and use of construction assets against priority operational requirements and recommending taskings for engineer assets.
- Developing construction standards and priorities.
- Providing input to the JCMEB.

Execution

3-22. During execution, the commander’s visualization helps determine if, when, and what to decide. Commanders and their staffs continuously assess the progress of operations toward the envisioned end state and modify orders, as required, to accomplish the mission. Execution involves monitoring the situation, assessing the operation, and adjusting the order as needed. Commanders continuously assess the operation progress based on information from the common operational picture, running estimates, and assessments from subordinate commanders. When the situation varies from the assumptions that the order was based on, commanders direct adjustments to exploit opportunities and counter threats. The staff, the engineer unit staff, and the combined arms engineer staff assist the commander in execution through the integration processes and continuing execution activities (see ADRP 3-0). In addition, commanders, assisted by the staff, perform the following activities specific to execution:

- Focus assets on the decisive operation.
- Adjust the commander’s critical information requirements based on the situation.
- Adjust control measures.
- Manage the movement and positioning of supporting units.
- Adjust unit missions and tasks as necessary.
- Modify the concept of operations as required.
- Position or relocate committed, supporting, and reserve units.
- Identify contract construction requirements.

3-23. A focus of operational engineer execution activities is to support sustainment distribution and the establishment of intermediate staging bases and forward operation bases. Construction activities, the refinement and identification of new requirements, and area damage control predominate execution. As with preparation, engineer forces will conduct additional construction or other technically related activities during the execution of the specific mission. Construction and technically related execution activities include—

- Construction safety program implementation and maintenance.
- Quality control implementation and enforcement.
- Periodic design and construction reviews.
- Preparation of as-built drawings.
- Response to construction contingencies.
- Construction contractor placement, scheduling, quality monitoring, and oversight.

3-24. As the theater sustainment base is established, focus shifts to the requirements supporting distribution. Theater distribution includes aerial delivery, airdrop, supply, maintenance, field services, operational contract support, procurement, and transportation. Operational engineer support for the developing distribution functions will include construction, bridging, and facilities engineering.

3-25. Considerations for the establishment of intermediate staging bases and forward operating bases include the size of the force projected to operate from base camps, the duration that the base camp will be required,
and the level of construction standards to be applied. Other important parameters include geographical location, weather, available construction materials, resources, utilities, political concerns for permanency, localized environmental hazards and health threats, and the impact on the local population. (See ATP 3-37.10 for more information on base development.)

3-26. General engineering forces are prepared to conduct and support area damage control. Area damage control is measures taken before, during, or after hostile action or natural or man-made disasters, to reduce the probability of damage and minimize its effects (JP 3-10). Commanders conduct area damage control when the damage and scope of the attack is limited and they can recover using local assets and resources. Optimally, commanders aim to recover immediately. This recovery involves resuming operations, maintaining or restoring order, evacuating casualties, isolating danger areas, and mitigating personnel and materiel losses. Some attacks may rise to the level of incidents of operational significance and may require additional resources for mitigation, recovery, and investigation.

Assessment

3-27. Assessment precedes and guides every activity in the operations process and concludes each operation or phase of an operation. Staffs analyze the situation in terms of mission variables to understand the mission and to prepare staff running estimates. They continuously assess the effects of new information on the operation. They update the staff running estimates and determine if adjustment decisions are required.

3-28. Engineer capabilities may be applied to add technical detail to the commander’s assessment. Engineer assessment and survey teams gather technically focused information on the physical environment, infrastructure, or other physical aspects of the AO. The relevancy of the information gathered adds to the depth of the commander’s understanding and can provide a technical basis for measures of performance or measures of effectiveness.

3-29. A focus of operational engineer assessment activities is monitoring reception, staging, onward movement, and integration requirements and the adequacy of the sustainment base. Operational engineer forces also conduct a variety of construction and other technical assessment activities focused on technical aspects of the support provided. Construction activities, real estate management, and facilities engineering are evaluated for adequacy to the requirements and conformance to quality standards. Construction and technical preparation activities include—

- Providing specific and certified assessments by FFE.
- Conducting necessary postconstruction acceptance inspections.
- Identifying master planning activities not yet completed from the project management process.

FORCE TAILORING

3-30. Operational planning prepares the way for tactical activity on the most favorable terms through the adequate resourcing of units and other capabilities. The challenge is to generate the engineer force that is tailored to the identified and anticipated requirements with respect to time, lift, and other constraints. In many cases, leveraging reachback and other engineer capabilities mitigates the impact of these constraints. The theater Army considers an expansive shape for the required force, including a general outline of the tactical forces required and the contemplation of effective operational configurations. Due to the variance in the demands of operations, there is no set engineer force structure and a needs-based, building block approach is used for force tailoring (see figure 3-2).

3-31. The tailored engineer force supporting the theater Army echelon will, in most cases, result from a collaborative effort among the theater Army engineer planners, their supported GCC engineer staff, elements at the Department of the Army (DA) and DOD, supporting Army and joint force providers (including U.S. Armed Forces Command, TEC, and USACE), and identified subordinate echelon units. USACE and other contract capabilities may not be immediately available in the AO, requiring available military units to focus on the commander’s highest priorities.
THEATER ENGINEER COMMAND

3-32. Each TEC is routinely involved in various military engagements with associated theater Army headquarters. For other major operations, the theater Army engineer collaborates with the TEC commander and staff as Army design methods proceed. A significant determination included in the force generation effort is timing and the level required for the deployment of TEC capabilities. For major combat operations, the theater Army echelon will typically require the early or phased deployment of the full TEC headquarters. Stability or DSCA operations vary but may require the deployment of the supporting TEC or its deployable command post. Figure 3-3 shows phased-deployment capabilities to task alignment of the TEC and its deployable command posts.
Legend:
AOR       area of responsibility
ASCC      Army Service component command
BDE       brigade
C4I       command, control, communications, computers, and intelligence
CCMD      combatant command CRU contingency response unit
DCP       deployable command post
DET       detachment EN engineer
FCC       functional combatant commander
FEST–M    forward engineer support team–main
HQ        headquarters
J-4       logistics directorate of a joint staff
JTF       joint task force–engineer
LOC       line of communication
MSR       main supply route
SCC       Service component command
TEC       theater engineer command
U.S.      United States

Figure 3-3. TEC mission command deployment model (continued)

3-33. The TEC serves as the senior engineer in the theater, is the only organization designed for the operational command of engineer capabilities at echelons above corps and will often provide mission command for the joint force command if an operational engineer headquarters is required. The TEC is focused on the operational mission command of engineer operations across all engineer disciplines and typically serves as the senior theater or land component engineer headquarters. When directed, the TEC provides mission command for engineers from other Services and multinational organizations and provides technical oversight (quality assurance and surveillance) assistance for contracted construction engineers according to the joint relationships established by the joint force command. The theater Army operationally configured as a JFLCC (or multi-Service headquarters) will benefit from the early or phased deployment of the full TEC headquarters. In a JTF configuration, TEC deployment may still be advantageous depending on JTF mission complexity and span of control. An engineer brigade may provide adequate engineer OPCON given a narrower span of control.

3-34. The TEC develops plans, procedures, and programs for engineer support for theater Army (including reception, staging, onward movement, and integration) requirements determination, operational mobility and countermobility, general engineering, power generation, area damage control, military construction, geospatial engineering, engineering design, construction material, and real property maintenance activities. The TEC commander receives policy guidance from the theater Army based on the guidance from the GCC joint force engineer. The TEC headquarters element provides mission command for operational engineer operations in the AO and reinforces engineer support to subordinate echelon forces. The TEC may support joint and multinational commands and other elements according to lead Service responsibilities as directed by the supported joint force command. This headquarters maintains a collaborative planning relationship with the theater Army and joint force staff engineers to help establish engineer policy for the theater. It also maintains coordination links with other Services and multinational command engineering staffs.

3-35. The engineer brigade is one of several functional brigades available to support theater level operations. It may be—
• Task-organized under theater level functional commands.
• Organized under mission command of the TEC.
• Directly subordinate to the theater Army.

3-36. When required, the theater Army may also task-organize functional brigades to corps or divisions. The engineer brigade provides expertise to the TEC, but with a reduced capability. A significant determinant in tailoring the engineer brigade is the anticipated breadth of OPCON and support functions. The TEC is capable of supporting a broad array of requirements, as is typical when the theater Army functions in an operational configuration while continuing its ASCC responsibilities. The brigade provides a more concentrated capability that may be adequate for a smaller-scale JTF configuration with some functional assistance from a subordinate headquarters of Army forces.
3-37. The TEC can deploy scalable staff specialty capabilities to support the needs of the operational commander. These elements are capable of providing a wide range of technical engineering expertise and support and coordinating support from USACE, other Service technical laboratories and research centers, and other potential sources of expertise in the civilian community. The elements are enabled by the global reachback capabilities associated with FFE. TEC resources are synchronized with USACE for peacetime engagements and to provide FFE and contract construction capabilities to the operational force (including engineering technical assistance, project planning and design, contract construction, real estate acquisition, infrastructure support, and support to nation-building capacities).

UNITED STATES ARMY CORPS OF ENGINEERS

3-38. USACE supports the theater Army headquarters (ASCC), as needed, with contract construction support from divisions, districts, and contingency elements and technical engineering assistance from the FFE program. These services may include commercial contract construction acquisition and management, project and program management, real estate and environmental services, technical services (for example, on-site, qualified assurance and surveillance through technically qualified engineer contracting officer representatives), and access to the full suite of USACE and other agency capabilities through reachback. The theater Army engineer collaborates with an assigned TEC and/or USACE liaison officer (LNO) for direct access to USACE resources to support engagement strategies and operations. The supporting LNO typically assists the theater Army in coordinating with the DOD-designated contract construction agent if that element is not USACE.

3-39. The FFE program for USACE provides cost-reimbursable, technical engineering assistance to the theater Army, drawing on USACE capabilities from the three engineer disciplines (primarily, general engineering) to support operations through reachback and forward presence. The FFE deployable teams include the forward engineer support team–main, forward engineer support team–advance, contingency real estate support team, and environmental support team.

Note. The 249th Engineer Battalion (Prime Power), Army Geospatial Center, and Engineer Research and Development Center are a few examples of the unique and specialized capabilities available through USACE to address specific operational requirements. These elements are not considered solely FFE capabilities but are available to support FFE.

3-40. The reachback element for FFE supports the deployable teams with an extensive expertise network from USACE and USACE associates in other Services, agencies, industry, and academia. Reachback can deliver specialized data, research, and expertise to forward entities when needed. (See USACE EP 500-1-2.)

3-41. If the theater Army is operating in one of the geographic areas of responsibility for USACE, the theater Army will also offer contract construction support. To support this effort, USACE can deploy mission-specific teams that are warranted and designed to deliver high-value projects, typically involving extensive construction within a HN. The teams may range from one or more engineer districts with supporting division headquarters elements, an area or resident office, or a unique team specifically designed for the mission.

3-42. A clear strategic vision for the overall HN reconstruction requires an office that is integrating all reconstruction efforts in the theater of operations. This entity would integrate all reconstruction programs, including those from the DOD, U.S. Agency for International Development, Department of State, coalition partners, humanitarian aid agencies, and HN. When USACE is the primary DOD contract construction agent, it achieves DOD program integration using a joint programs integration office located in the theater engineer cell. The joint programs integration office—

- Plans, programs, and oversees all major DOD construction programs.
- Develops strategies for implementing DOD programs related to HN water, energy, and transportation infrastructure.
Provides program management and technical expertise in real estate, electrical/fire safety, and environmental elements of DOD programs.

Creates short-, medium-, and long-term goals for DOD programs and an action plan for attaining these goals in cooperation with senior military personnel in the operational environment, Department of State, and U.S. Army Agency for International Development. Successful goals and plans require the complete integration of all stakeholders.

3-43. In the absence of a joint programs integration office, another entity must assume the responsibilities listed above to ensure the integration of all engineer construction efforts and avoid effort duplication by one or more agencies.

ENGINEER AND MULTIFUNCTIONAL FORCES

3-44. The units that make up the theater Army echelon engineer force are diverse with technical skills that range from highly specialized to multifunctional and multisourcing (including Army, joint, and multinational force providers). Operational engineer planners are challenged to comprehensively identify current and future requirements across the range of organizational skill sets. Typically, operational priorities and substantially defined, subordinate requirements are clear and the associated tasks and troop formations are evident. For operational planners, requirements for supporting the less substantially defined tactical needs of subordinate echelons become increasingly ambiguous. To ensure the adequate resourcing of units to meet these needs, planners must consider troop formations and tasks that are evident and also provide for the flexibility to mitigate uncertainty.

3-45. Planners use the engineer discipline and its primary relationship to warfighting functions to organize and ensure that there is an integrated view of operational requirements. At the theater Army echelon, a significant focus is placed on general engineering capabilities that must be tailored according to the operational requirements linked to the movement and maneuver, sustainment, and protection warfighting functions. These requirements include—

- **Construction requirements.** Construction requirements typically exceed Army unit capabilities and must be analyzed, with consideration given to joint, multinational, contract, and other capabilities.
- **Specialized requirements.** Specialized requirements may require additional or technical information to effectively associate with tasks and troops. FFE or reachback may be employed to guide the technical assessment needed. Theater Army echelon engineer planners may, through their own analysis of the situation, determine the tailored force required by operational priorities and substantial subordinate requirements. They will need subordinate echelon input to more precisely tailor the force required to meet the tactical engineer requirements.

3-46. Theater echelon engineer planners typically develop a broad, but less defined, understanding of the requirements at each lower echelon. Geospatial engineering support, though organic at each echelon down to BCT, may generate requirements for augmentation at the operational or a selected subordinate echelon. General engineering support requirements linked to the movement and maneuver, sustainment, and protection warfighting functions at each subordinate echelon may be evident and accepted as an operational force responsibility or considered in tailoring the subordinate echelon. Similarly, general engineering support as augmentation to combat engineering capabilities at lower echelons may be considered but will be less clearly defined. Finally, additional combat engineering requirements for each BCT and major tactical element are considered. Augmentation is provided in the form of additional combat and general engineering capabilities, with the appropriate engineer and multifunctional headquarters elements. For the operational planner, the type and level of augmenting capabilities will likely be ambiguous. To ensure that there is a flexible force adequate for comprehensive operational requirements, planners must employ more than their own broad understanding of those requirements.

3-47. When available for collaborative planning, subordinate echelon headquarters provide invaluable input for their assigned mission requirements and for some operational requirements that may have been overlooked by the higher echelon. Subordinate echelon engineer units and the engineer staff supporting corps, division, and other headquarters develop an understanding through a more concentrated analysis of the
situation. The resulting view adds depth to the understanding the engineer forces that are required for mission support.

3-48. The tailored engineer force supporting the theater Army echelon will typically include joint and multinational engineer formations. Planners mesh Service capabilities with joint, multinational, interagency, and nongovernmental organizations. Operational engineer planners consider the joint engineer force capabilities and collaborate with joint force providers to effectively align joint capabilities with the necessary requirements. Consideration will typically include tactical limitations for joint engineer forces. While Navy and Air Force engineer forces include a variety of technical skill sets, they are often limited in ground combat capabilities (for example, certain Air Force engineer units possess highly skilled electrical, plumbing, and other utilities and construction crafts but are limited in their capability to move to and secure a work site). This unit type would be appropriate as a joint resource for requirements within a base but not for requirements throughout a less secure operational area.

OTHER CAPABILITIES

3-49. With augmentation from other Services, the theater Army can provide a JTF headquarters for contingencies. Other situations may generate requirements for individual augmentation within the theater Army or a subordinate echelon headquarters. Similarly, the situation may require the tailoring of individual augmentees for a provisional headquarters or provisional teams. The GCC supports the theater Army with joint individual augmentees, as available, through its standing joint force headquarters. As requirements exceed the GCC capabilities, they are passed to joint force providers. The Army provides individual augmentees through its worldwide individual augmentee system.

3-50. Commanders may use an operational-needs statement to document an urgent need for a material solution to correct a deficiency or to improve a capability that impacts mission accomplishment. The operational-needs statement provides an opportunity for the field commander, outside of the acquisition and combat development and training development communities, to initiate the requirements determination process. A response to the operational-needs statement will vary depending on the criticality of the proposed item. Response can range from a headquarters, DA-directed requirement and fielding of a material system to the forwarding of the action to the U.S. Army Training and Doctrine Command for review and routine action. The theater Army engineer staff may become involved in the reviewing and processing of engineer-related statements as part of the theater Army echelon administrative control responsibilities. Examples of engineer-related operational needs may include bridging or construction equipment, EH clearance improvements, and other nonstandard capabilities. (See AR 71-9 for more information on processing operational-needs statements.)

3-51. Theater Army echelon engineers should understand contingency construction authorities and associated funding to meet construction requirements and activities in support of contingency operations. The USACE LNO at the theater Army echelon can advise engineer planners on contract construction and the integration of these assets. Although USACE engineer districts and other contract construction elements are cost-reimbursable, their missions support the campaign plan of the theater Army. At the theater level, a joint program integration office is included in the theater engineer cell to ensure the coordination and integration of DOD construction missions throughout theater.

3-52. Theater Army echelon engineer missions are conducted considering the range of military operations occurring throughout the theater. The theater Army engineer staff routinely coordinates construction activities that assist the GCC in shaping the security environment in a particular region while maintaining presence within the AO. The engineer staff may also participate in exercise programs within a particular AO as a tool to maintain presence and to foster strong military-to-military cooperation. USACE and other unified action partners are strategically engaged worldwide in activities that promote national security objectives by improving HN infrastructure (for example, products of the exercise-related construction program, Humanitarian and Civic Assistance Program, and Support for Others Program. Each theater Army USACE LNO, TEC LNO, and joint program integration office assists in coordinating these activities with the senior engineer staff organization.

3-53. The theater Army engineer staff coordinates for the engineer support required for limited intervention operations. Support may include tailored engineer modular forces and the application of a variety of joint
and other engineer capabilities. The theater Army USACE and TEC LNO may assist in integrating USACE and unified action partner activities that support operational objectives. Engineers are critical enablers in foreign humanitarian assistance conducted to relieve or reduce the results of natural or man-made disasters. The engineer response may include—

- Erecting temporary shelters and clinics.
- Removing debris.
- Performing temporary construction to reinforce weakened superstructures.
- Reestablishing transportation right-of-ways.
- Constructing protective structures.
- Constructing levees to contain rising floodwaters.
- Creating flood prediction models for mapping disaster effects.
- Fighting fire.

3-54. Peace operations, irregular warfare, and major combat operations typically involve the introduction of larger military forces into the operational area. This range of military operations implies a degree of theater echelon engineer support for access, base development, sustainment base establishment, and operational movement requirements. While each theater or JOA is unique from a broad perspective, each will follow a pattern from some level of immaturity at the beginning of operations, through development, to established standards and the maintenance of those standards during operations and, finally, the closure or turnover of bases and other facilities as operations conclude. Lesser-developed theaters or operational areas tend to generate more operational engineer effort earlier in the operations process. (See table 3-2 for a general comparison based on the development level.)

### Table 3-2. Development level-based requirements comparison

<table>
<thead>
<tr>
<th>Lesser Developed Theater</th>
<th>Highly Developed Theater</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater effort is required to establish seaports of debarkation and aerial ports of debarkation.</td>
<td>Seaports of debarkation and aerial ports of debarkation may be available but require improvement.</td>
</tr>
<tr>
<td>Geospatial data may require generation.</td>
<td>Geospatial data may be available.</td>
</tr>
<tr>
<td>Real estate acquisition is less likely.</td>
<td>Real estate may be more available for acquisition.</td>
</tr>
<tr>
<td>Environmental conditions may be unknown.</td>
<td>Environmental baseline may be established.</td>
</tr>
<tr>
<td>Austere base camps and forward operating bases may be required.</td>
<td>Installations may be available for temporary use.</td>
</tr>
<tr>
<td>Road network is likely limited.</td>
<td>Road network is available.</td>
</tr>
<tr>
<td>Natural obstacles predominate.</td>
<td>Man-made obstacles predominate.</td>
</tr>
<tr>
<td>Primitive or basic infrastructure is present.</td>
<td>Complex or extensive infrastructure is present.</td>
</tr>
</tbody>
</table>

3-55. Major operations conducted overseas combine offensive, defensive, and stability elements that are executed simultaneously at multiple echelons. Army forces provide a mix of land combat power that can be tailored for any combination of offensive, defensive, and stability or DSCA tasks as part of an interdependent joint force. At higher echelons, engineer operations consist of more technically focused tasks that simultaneously support offensive, defensive, and stability or DSCA operations. The technical aspects of engineer tasks at higher echelons become increasingly essential to their effective application (for example, from an operational perspective, the application of engineering efforts to repair and upgrade a road and its component bridges tends to retain a consistent set of technical tasks). Operational elements have less impact than the technical aspects of the engineering tasks. Most operational engineering simultaneously supports all operational elements (for example, an upgraded road supports the movement of forces into attack positions, the repositioning of counterattack forces in a mobile defense, and the movement of forces supporting civil
security). Theater Army echelon engineer operations apply technical capabilities to create favorable conditions for any combination of operational elements.

3-56. While the influence of distinct operational elements may be lessened for some technically focused engineering tasks, the overall engineer effort must remain integrated within the combined arms framework. The engineer staff participates in the operations process to synchronize the orchestration and sustainment of primarily subordinate echelon engineer actions and the application of more technically focused engineer capabilities. Some generalities can be observed when considering the operational elements and higher-echelon engineer operations.

3-57. For major combat operations, a significant portion of the tailored engineer force tends to have command relationships to maneuver commanders. The tailored engineer force will be pushed using command relationships in the task organization to tactical echelons for close support of combat operations. This will be true for some general engineering capabilities and for most combat engineering capabilities. Movement and maneuver requirements are not well defined at higher echelons and are more dynamic in combat operations. Tailored forces are pushed to subordinate echelons to address these requirements and add flexibility for those maneuver commanders to react to unforeseen challenges and opportunities.

3-58. For defensive operations, operational engineer planners will not typically be able to generate adequate construction capabilities to support the subordinate requirements for movement and maneuver (countermobility) and protection (survivability). Operational requirements will compete for these same construction capabilities. The operational planner must recommend priorities for these capabilities and then work collaboratively with subordinate elements for assistance in mitigating shortfalls.

3-59. When planning for stability operations, engineers consider the broadest range of potential requirements. The operational engineer planner considers the theater echelon requirements linked to the movement and maneuver, sustainment, and protection warfighting functions, while also considering nonlethal applications supporting the objective end state. Subordinate echelons also require a broad range of general engineering support. Subordinate echelons may conduct combat operations that require combat engineering with the appropriate augmenting general engineering capabilities. The tailored engineer force is distributed among echelons for operational applications and the close support of subordinate operations. Stability operations are most likely to occur in close coordination with multinational and interagency elements and among the local population. Contract construction capabilities will most likely also be required to support infrastructure and reconstruction needs. The construction requirements will likely exceed Army unit capabilities. Operational subordinate echelon and engineer leaders and staff will be required to coordinate efforts from a range of other capabilities to meet the extensive construction requirements.

3-60. Planning for DSCA operations is significantly different from offensive, defensive, or stability operations because of the unique nature of the threat; although, the basic tasks may be similar to those of stability. The threat will likely be a natural or man-made disaster, accident, or incident with unpredictable consequences. Additionally, planners must be aware of the statutes and regulations that restrict Army interaction with other governmental agencies and civilians during DSCA operations. The local and state response normally leads the effort with a federal response providing support as required. The interagency response during DSCA operations is governed by the National Response Framework, which delegates responsibility to various federal agencies for emergency support functions. Each lead agency is responsible for planning within their assigned emergency support functions.

3-61. Army commanders will assume a support role to one or more designated agencies. Engineers can expect to be involved in planning for the support of relief operations with geospatial products and the analysis of potential areas to establish life support areas. Engineer commanders and staffs work with proponent planners to identify requirements and plan engineer applications. USACE and other engineer capabilities of the generating force have a prominent role in DSCA operations. Engineers may be called upon to provide manpower support or general engineering support to execute the following operations:

- Urban search and rescue.
- Route opening and route clearance.
- Temporary and tactical bridging.
- Environmental control and groundwater sampling.
- Decontamination site and holding-pond construction.
Humanitarian and temporary shelter construction.
Controlled demolition (in support of mass firefighting operations in urban areas).
Power generation and distribution.
Firefighting.

OPERATIONAL CONFIGURATIONS


3-63. The normal command relationship between the GCC and the theater Army is combatant command. Functional combatant commands (Strategic Command, Special Operations Command, Transportation Command, and Joint Forces Command) have their own unique ASCCs. These ASCCs are not theater armies.

3-64. A theater Army performs the following functions for the GCC:

- Serves as the ASCC and headquarters for Army forces within the theater. In this capacity, the theater Army commander (as the ASCC commander) is responsible for the administrative control of Army forces within the supported GCC area of responsibility.
- Is organized and equipped to exercise OPCON of joint and multinational forces within a joint campaign while continuing to perform its theater responsibilities with joint and multinational staff augmentation as appropriate.

3-65. A significant theater echelon engineer effort is also required as a support provider and the ASCC. The theater Army headquarters continues to perform area of responsibility-wide functions and its operational responsibilities. These functions include reception, staging, onward movement, and integration; logistics over-the-shore operations; and security coordination. The theater engineer staff officer integrates and coordinates the theater echelon engineer staff and tailored engineer forces to best support the theater Army in its roles and operational configurations.

DEPLOYED ARMY, JOINT, AND MULTINATIONAL FORCES

3-66. The theater Army headquarters is the primary vehicle for providing Army support to Army, joint, interagency, and multinational forces operating across the combatant commander’s AO. Joint forces rely on Army forces for support and services as designated in—

- 10 USC.
- DOD directives and instructions.
- Inter-Service agreements.
- Multinational agreements.
- Applicable federal regulations.

3-67. The support provided to joint forces and other support directed by combatant commanders are broadly defined as Army support to other Services. Similar directives govern the provision by the theater Army to deployed joint, interagency, and multinational forces for common-user logistics. Army support to other Services, common-user logistics, and deployed Army forces are continuous tasks performed by the theater Army regardless of whether the theater Army controls land forces in a major operation. The theater Army—

- Tailors the assigned land forces for joint operations.
- Supports theater security cooperation plans with Army forces and the appropriate mission command.
- Provides theater level augmentation to Army forces in JOAs (including capabilities, liaison teams, and public affairs teams).
- Develops the mission-essential task list for conventional Army forces assigned to the AO or programmed to deploy to the AO as part of an approved operation plan.
- Provides training support, materials, and regional expertise to aligned Army forces.
• Provides Army support to the joint force, other Services, other U.S. governmental agencies, and multinational forces as directed.
• Establishes and secures theater bases and conducts reception, staging, onward movement, and integration through the theater support command and gaining maneuver units.
• Orchestrates the deployment sequence and introduction of Army forces into the theater.

3-68. The theater Army commander uses the main command post to control the support required as directed by the GCC. The theater Army provides its support primarily through its supporting commands and brigades and the tailoring of mission command organic and attached capabilities. For engineer support, the theater Army engineer staff officer coordinates the activities of the assigned engineer staff and may use assistance from the TEC or its tailored mission command elements when available. The engineer staff officer employs an assigned or supporting USACE FFE element to access additional capabilities through reachback and coordinates support from the contract construction agent, regardless of agent representation by USACE or Naval Facilities Engineering Command.

3-69. Theater Army echelon engineers coordinate with the theater support command to provide general engineering support to operational sustainment throughout the theater (including requirements for support to the joint force, other Services, other U.S. governmental agencies, and multinational forces as directed). The theater support command is the senior Army sustainment headquarters in an AO. While its focus is on sustainment, it does not normally provide the health service support component of sustainment, which is performed by the medical command. The theater support command provides the modular Army with a single operational echelon that is responsible for the mission command of sustainment operations in support of Army, joint, interagency, and multinational forces. The theater support command is capable of planning and executing sustainment operations for the theater Army or joint force command. It provides mission command in support of operations during simultaneous deployment, employment, sustainment, redeployment, and reconstitution. The theater support command also coordinates through the engineer staff officer for geospatial engineering support. The engineer staff officer may rely on the TEC to provide the appropriate liaison elements to the theater support command while the theater engineer staff coordinates with their sustainment counterparts on the staff.

3-70. Similarly, the theater Army engineer staff officer may rely on the TEC to provide liaison and coordination capabilities with other theater echelon supporting commands and brigades. An example is the theater-focused Civil Affairs Command aligned with theater Army. The Civil Affairs Command develops the civil affairs-related portion of plans, policies, and programs for the GCC and theater Army commander. The Civil Affairs Command may deploy a theater level civil-military operations center to coordinate, analyze, and enable policies, programs, and stability operations capabilities in support of the theater Army. The engineer staff officer will typically rely on the TEC for direct coordination and liaison with the Civil Affairs Command and theater level civil-military operations center.

ARMY SERVICE COMPONENT COMMAND

3-71. As the ASCC, The theater Army exercises administrative control over Army forces in the AO. Administrative control is the direction or exercise of authority over subordinate or other organizations in respect to administration and support (including the organization of Service forces, control of resources and equipment, personnel management, unit logistics, individual and unit training, readiness, mobilization, demobilization, discipline, and other matters not included in the operational missions of the subordinate or other organizations). The main command post is primarily responsible for Army activities throughout the supported GCC AO. It focuses on—
• Developing and issuing Army AO-wide policies and providing policy guidance.
• Reviewing and evaluating the performance of Army programs across the AO.
• Allocating and distributing Army resources throughout the AO.
• Conducting AO-wide, mid- and long-range planning, programming, and budgeting.

3-72. The ASCC engineer staff officer identifies and addresses theater-wide requirements for construction and engineer support. The engineer staff officer typically employs the various working groups and boards that are established and employs LNOs assigned from USACE and other elements. As requirements are identified, priorities are recommended, funding is identified, and directives or contracts are issued.
3-73. The ASCC engineer staff officer also provides a critical linkage for the provision of 10 USC support and requirements to deployed engineer forces. The engineer staff officer provides information and coordinates activities impacting the training, equipment, supply, and maintenance of the AO-specific engineer force.

JOINT FORCE LAND COMPONENT COMMAND

3-74. When the GCC acts as the joint force commander during major combat operations, the theater Army headquarters may provide the JFLCC headquarters. In that case, the GCC exercises OPCON over land forces deployed to a JOA. This may include controlling multiple divisions, corps-sized formations, and forces from other Services. During major combat operations, the operational command post of the theater Army normally provides a base for the JFLCC headquarters and responds directly to the GCC. The theater Army headquarters continues to perform AO-wide ASCC functions (including joint reception, staging, onward movement, and integration; joint logistics over-the-shore operations; and joint sustainment area coordination).

3-75. The JFLCC engineer staff officer typically relies on the TEC or its tailored mission command elements for the operational mission command of JFLCC engineer support. The JFLCC engineer staff officer also employs an assigned or supporting USACE FFE element to access additional technical and contract construction capabilities.

JOINT TASK FORCE

3-76. Although not organized primarily to act as a JTF headquarters, the theater Army headquarters can use its operational command post as a base from which to form a JTF headquarters for crisis response or limited contingency operations with augmentation of the standing joint force headquarters and other joint Service manning. Within each GCC, these capabilities are emphasized or deemphasized through the strategic tailoring of the Army forces assigned to that particular theater Army headquarters.

3-77. Forming a JTF headquarters from the theater Army operational command post has advantages and disadvantages. An advantage is using regionally focused headquarters with a senior rank structure. It has disadvantages in that it curtails the capability of the theater Army to perform as a JFLCC for another operation. The theater Army is not designed to simultaneously serve as a JTF, JFLCC, and ASCC. When deployed as a JTF headquarters, the theater Army headquarters retains its administrative control responsibilities, therefore, the theater Army commander uses the operational command post to provide the JTF headquarters while the main command post continues to perform its theater-wide functions.

3-78. Because the theater Army headquarters continues to perform AO-wide functions and its operational responsibilities, the theater Army-formed JTF may require a separate engineer staff officer. The theater Army engineer staff officer may transition to become the JTF engineer staff officer with a designated ASCC engineer staff officer assuming responsibilities as the new split engineer staff officer. Similarly, the theater Army-formed JTF may identify the requirements for separate engineer headquarters units supporting the JTF and the ASCC functions. The JTF engineer staff officer may rely on a TEC element or an engineer brigade for the operational mission command of JTF engineer support while the ASCC may require an engineer battalion or brigade to provide mission command for engineer operations supporting ASCC functions. The JTF engineer staff officer may also employ assigned or supporting USACE elements to access additional technical engineering and contract construction capabilities.

3-79. The role of the JTF engineer depends on the mission and situation, and it varies in response to the JTF commander’s intent. The role of JTF engineer is a critical decision that is made early in the planning process by the JTF commander, and the role dictates the JTF engineer location within the JTF staff. Mission analysis determines if engineer tasks largely support operational movement, maneuver, and fires or predominantly support force sustainment (logistics). If mission analysis indicates that support to maneuver and fires is the principal engineer activity, then the JTF engineer is normally an element directly under the J-3 and the joint operations center. If logistics support is included in most of the engineer missions, the J-4 will have staff responsibility for engineering. If engineering is essential to the success of the JTF mission (as frequently occurs in foreign humanitarian assistance and DSCA operations) or if the JTF commander wants direct visibility of engineering issues, the JTF engineer may become a separate, primary staff function and report directly to the commander. This role determines the direction and composition of engineer planning teams.
It is vital that naval civil engineering forces assigned responsibilities to a JTF seek out and contact the JTF engineer and ensure that they coordinate their planning effort with the JTF engineer plans and guidance.
Chapter 4

Corps Echelon Engineer Operations

The corps provides a headquarters that specializes in operations as a land component command headquarters, a JTF for contingencies, or an intermediate tactical headquarters within very large groupings of land forces. This chapter focuses on engineer operations at the corps echelon. It describes characteristics and considerations for engineer operations that support the corps, the refinement of Army design methods, and the integration within the operations process conducted by the corps headquarters. It examines the specific considerations for force-tailoring engineer units and capabilities for the corps, the implications of the assigned major operation, and the considerations for the operational elements from the corps perspective. This chapter also describes the specific engineer considerations for each operational configuration of the corps headquarters.

INTEGRATION

4-1. The corps headquarters is organized, trained, and equipped to serve as the Army force in major operations and campaigns with the command of two or more Army divisions supporting theater level organizations across the range of military operations. As the Army force for the joint force command, the corps serves as an operational headquarters and conducts land operations as the Service component. The corps can control up to five Army divisions in large-scale combat operations. The corps normally has one expeditionary sustainment command and one medical brigade in direct support. Other theater level assets are attached as required. The mission command capabilities organic to the corps allow it to adapt to operational or tactical roles, depending on the combatant commander’s requirements.

CORPS PERSPECTIVE

4-2. With minimum joint augmentation, the corps can function as a JTF or JFLCC for small-scale contingencies. When a corps is a JTF or JFLCC, a deployable TEC command post is assigned as the senior engineer organization. The corps can also serve as a deployable base for a multinational headquarters directing protracted operations. The flexibility of the corps allows the Army to meet the needs for an intermediate land command while maintaining a set of headquarters for contingencies. The corps reviews challenges and opportunities associated with the operational approach and concentrates on the substance and shape of the required tactical actions. The corps perspective is shaped by a specified contingency but retains the flexibility to span operational approach as described by theater to tactical actions inferred and defined by the corps and subordinate echelons. Figure 4-1, page 4-2, is an example of how the corps echelon engineer perspective builds on a foundation of operational requirements while detailing tactical requirements for the selected contingency.

4-3. At the corps echelon, the engineer staff officer and other engineer staff assist in understanding and translating Army design methods into a corps concept of operations. The corps engineer staff analyzes the foundation provided by the theater and begins to concentrate on the remaining problems. From the operational perspective, the corps engineer offers validation for the analysis supporting the theater engineer design. The corps engineer analysis may add detail or offer new information for theater consideration. Ultimately, as theater engineers refine and address requirements at their echelon, the corps echelon engineers gain an understanding of the operational requirements that must be included in corps operations. From the tactical perspective, corps echelon engineers concentrate on the substantial development of engineer
requirements and the capabilities necessary to support the corps concept of operations. The corps echelon engineer analysis comprehensively considers and shapes combat, general, and geospatial engineering support with a concentration on the corps concept of operations.

4-2. Figure 4-2 shows how corps echelon engineers integrate the operational engineer approach and tactical engineer actions through warfighting functions to support the corps concept of operations.

4-4. Figure 4-2 shows how corps echelon engineers integrate the operational engineer approach and tactical engineer actions through warfighting functions to support the corps concept of operations.

4-5. The corps engineer staff collaborates with the theater Army engineer staff to support engineer headquarters and the subordinate echelon engineer staff, refines operational engineering concepts, and adds substance to the engineer actions required. The capacity of the corps engineer staff to concentrate on detailing the capabilities required for supporting a specific major operation or contingency significantly adds to the depth of the theater engineer concept. Similarly, when an engineer unit headquarters is identified in support of the corps echelon, the engineer commander brings additional capacity for developing engineer support concepts. Finally, when subordinate echelons are identified and available for collaborative planning, the corps echelon can gain even greater depth through those subordinate engineer support concepts.

4-6. The corps engineer staff officer running estimate provides a working compilation of relevant information that is primarily focused on the physical environment of the designated AO, with a comprehensive accounting for engineer units, capabilities, and other resources associated with the major operation or contingency. The running estimate is built on input from the initial assessment by theater Army engineers and is further developed with consideration to mission variables. The corps level engineer running estimate evolves with the development of the corps concept of operations. The relevant information contained in the corps engineer staff officer running estimate logically connects identified challenges and opportunities to an operational requirement that is supported by the theater Army or to a requirement for corps consideration. The running estimate can be organized by engineer discipline and warfighting function (shown in figure 4-2). The running estimate is continuously refined and updated as additional assessments are made, guidance and priorities are established, and feedback is gathered. (See appendix C for developing and maintaining the engineer running estimate.)
The theater Army headquarters tailors the corps headquarters to meet the mission requirements. The corps engineer and other staff planners enter the operations process for a major operation or contingency with, at the least, a foundation of Army design methods. Even when the corps acts as a JTF headquarters, the GCC or other higher headquarters begins developing Army design methods. Some degree of operational guidance is available to inform the corps of the situation. This information is used for an informed analysis of the situation based on mission variables, and it enables the corps commander’s initial understanding. The commander’s understanding forms the basis for visualization, which may be expressed in corps planning guidance. This planning guidance is a reflection of how the commander envisions the operation unfolding. It provides a broad description of when, where, and how the commander intends to employ combat power within the higher commander’s intent. Planning guidance also contains priorities for each warfighting function.

The corps engineer may begin shaping engineer operations by understanding and influencing the commander’s initial priorities. At the corps echelon, this effort requires an early understanding of operational engineer support responsibilities as defined by the theater echelon and GCC. Corps engineer planners should validate aspects of higher-echelon support (for example, the theater Army echelon typically accepts responsibility for the provision of contingency basing and facilities). During design and construction preparation for basing and facilities, the theater engineer staff may not have access to the full depth of these requirements. As corps engineer planners validate theater engineer designs for basing and facilities, they adjust or refine the execution of the construction effort. This validation of theater operational engineer support is an important but peripheral effort to planning for engineer operations in support of the corps concept of operations. The validation of support and the concept of operations are guided by the commander’s priorities in the planning guidance and provided by the engineer planner’s improved understanding to influence those priorities, as necessary.

For major operations or contingencies, the corps likely faces a unique theater or JOA. This discussion is applicable from a corps perspective, and the GCC and theater Army typically expend some effort in mitigating the impact of those differences on the corps operation. In many cases, the corps inherits an accessible theater with a developed or developing sustainment base and real estate already acquired or in acquisition. Typically, the corps participates in and continues base development already in progress. Standards are likely already established, but some refinement may be necessary. Corps echelon engineers consider the maintenance of those standards during operations and as the closure or turnover of bases and
other facilities conclude. In unique circumstances, corps echelon engineers may be presented with the broader assortment of engineer requirements generated by an undeveloped operational area.

4-10. Engineer operations act as one of many key enablers as the corps commander drives Army design methods and the tactical concept of operations to shape conditions and achieve objectives. To be effective as an enabler, the engineer staff must be integrated into the effort to assist the commander in refining Army design methods provided and formulating the concept of operations. The engineer staff is organized to meet the mission. Corps engineer staff may have representatives distributed across the staff or may organize as a special staff. The engineer staff must also integrate within planning horizons (plans, future operations, and current operations). The engineer staff officer and engineer staff have unique challenges in coordinating and synchronizing engineer disciplines based on the organization selected. Consideration for the engineer disciplines assist the staff in organizing capabilities, warfighting functions synchronize staff engineers with other enablers, and elements of Army design methods provide a framework for refining design concepts. The corps engineer staff officer and other engineer staff integrate these efforts through the operations process to refine operational engineer support from the theater and to develop the corps concept of engineer operations.

OPERATIONS

4-11. In many situations, the corps echelon takes on a design that contains some details from the theater Army or the GCC. The corps echelon shares a broad, operational view with higher echelons but is afforded a more singular focus by the assigned AO. The corps echelon engineer staff must understand the elements of Army design to participate in its refinement. Corps echelon commanders use more objective-focused problem solving to develop a detailed corps concept of operations. The resulting concept of operations forms the basis for developing the operation plan or operation order. During execution, corps commanders assess the situation from operational and tactical perspectives to adjust current and future operations and plans as the operation unfolds.

4-12. Engineer missions require coordination throughout the corps echelon operations process. The corps echelon engineering effort requires consideration of the engineer requirements identified from operational- and tactical perspectives and is linked through the warfighting functions to Army design methods and the corps concept of operations. For the corps echelon engineer staff, the activities of the operations process are increasingly simultaneous, like those for the theater echelon. For the corps, however, these activities have a singular focus on the assigned major operation. Assessments (including some technical assessments) are required to enable planning and engineering preparations. These preparations must, in many cases, occur as operational planning is conducted. The execution of selected engineer tasks usually precedes operational execution, and operational assessments generate additional engineer requirements. While the engineer staff cycles among selected activities demanded by engineer requirements, they must remain synchronized with their staff counterparts in the broader operations process.

Planning

4-13. The corps trains as a joint headquarters for contingency operations. At the operational level, a subordinate joint force commander develops supporting plans, which can include objectives supported by measurable operational effects. Joint interdependence requires that personnel at the corps headquarters understand the joint doctrine that addresses these planning techniques.

4-14. Corps engineer planners assist in defining an AO, estimate the forces required, and evaluate operational requirements. They also assist in determining specific objectives and detailing the COA selected for achieving those objectives, use the planning processes (including joint processes) and tools, and use the commander’s intent to develop and refine COAs that contribute to setting the conditions and achieving objectives in the AO. Corps engineers maintain a peripheral view of the operational engineer support required while concentrating on supporting the corps concept of operations. As units are identified to participate in the operation, they collaborate as fully as possible to gain depth in developing the operational environment analysis and add to planning and problem-solving capabilities. This collaboration also extends the subordinate engineer’s planning, preparation, and execution horizon.

4-15. Typically, the corps headquarters is identified as the joint force land component. As such, the corps follows joint doctrine and the joint operation planning process, rather than the MDMP, is identified as the
Corps Echelon Engineer Operations

primary tool for deliberate planning. Corps engineer planners participate along with their staff counterparts in the process to translate the commander’s visualization into a specific COA. The corps echelon engineers collaborate closely throughout the MDMP with their counterparts in the theater Army and GCC engineer staff to develop a shared understanding of the mission. Table 3-1, page 3-4, provides some of the engineer planning considerations that pertain to each step of the MDMP (route clearance and bridging are two examples of essential mobility tasks that are typical requirements and important at the operational level). As the plan is developed, engineer planners remain synchronized through warfighting functions.

4-16. As operational planning proceeds through the MDMP, engineers rely heavily on analytic techniques to guide functional problem solving. These techniques demand technical information, which may be available from existing assessments or may require additional assessments or surveys. Support that is available through reachback or collaborative planning may be used for technical details.

4-17. Control measures are established under a commander’s authority. Staff officers and subordinate leaders can also establish control measures with the commander’s authorization. Aided by the engineer staff, the corps commander exercises control over engineer forces in the corps AO. Staffs provide control and keep the commander informed. The following are some of the measures employed by the corps echelon engineer staff to provide control and keep the commander informed:

- Construction priorities and project lists.
- Engineer task organization and command and support relationships.
- Engineer work lines and other graphic control measures.
- Obstacle control measures (authorities retained or released).
- Reporting requirements.
- Engineer staff procedures and battle drills.
- Engineer-specific boards, cells, centers, and working groups (acquisition review, joint facilities utilization board, basing, EH, geospatial, mobility, countermobility, and survivability).
- Engineer-specific programs and policies (new equipment fielding and training, EH policies, construction standards).

Preparation

4-18. The corps echelon gives significant focus to integrating engineer support within combined arms forces. Implementing the engineer task organization and linking engineers with their gaining or supported units is an important and challenging preparation activity. The engineer staff officer in the headquarters directing the task organization initiates the coordination effort by ensuring that the necessary linkup instructions are contained in the operation order of the gaining or supported unit. In many cases, corps echelon and subordinate engineer units conduct preparation activities integrated within the combined arms task organizations required by the operation. Combined-arms rehearsals are especially critical to the success of a breaching, clearing, or gap-crossing operation. Engineer integration within the reconnaissance efforts at the corps and subordinate echelons are another important, yet challenging, preparation activity.

4-19. Preparation considerations include an in-depth terrain analysis of the operational area using reachback support from the National-Geospatial Intelligence Agency, Topographic Engineering Center, and USACE Reachback Operations Center as required. Preparation considerations also include developing survivability standards and resourcing construction and barrier materials to support corps operations. Engineer task organization is further refined to support combat operations, specifically breach and gap-crossing operations. An analysis of how to shape the AO through obstacles, mainly by destroying enemy lines of communication and through scatterable mine emplacement, may be included in preparation considerations.

4-20. The corps echelon engineer must review and refine operational engineer support. The corps may rely on theater Army support for reception and staging in the theater and to establish the sustainment base. These may be included with other corps preparation responsibilities. A more concentrated focus is applied to preparation activities that support onward movement and integration of the corps. Construction activities, real estate management, and facilities engineering predominate during preparation. Operational engineer
forces conduct a variety of construction and other technical preparation activities focused on the specific mission. Construction and technical preparation activities include—

- Completing and reviewing designs. In a design-build process, the design is typically completed at a 10 to 30 percent resolution before execution.
- Conducting the necessary preconstruction studies or surveys.
- Identifying additional technical support requirements.
- Completing detailed planning activities (estimates, bills of materials, schedules) that were not completed through the project management process.
- Preparing the construction site (staging equipment, stockpiling materials, completing temporary construction) as required.

4-21. Operational engineer preparations include addressing facility requirements (including the standards to be applied). The requirements should—

- Reflect the general engineering support necessary for the expected duration and intensity of operations.
- Be limited to the forces employed (including multinational, HN, and contractor).
- Be time-phased.

4-22. Adequate funding must be available to undertake the early engineer reconnaissance and acquisition of facilities to meet requirements through construction or leasing. Facilities are grouped into broad categories that emphasize the use of existing assets over new construction.

4-23. Corps level preparation activities may also include establishing or participating in working groups, boards, or cells to solve problems and coordinate actions. Conducting theater Army echelon engineer operations may be managed by a theater or regional contingency engineering management cell that requires corps participation. The composition and procedures of the theater contingency engineer management and regional cells are governed by the respective GCCs. These cells are augmented from the staffs that they support (including the corps). The theater and regional contingency engineering management cells apply the commander’s intent, merge engineer support requirements, and arrange for resources.

Execution

4-24. A focus of corps echelon operational engineer execution activities is support to sustainment distribution and the establishment of base camps. Construction activities, the refinement and identification of new requirements, and area damage control predominate during execution. As with preparation, engineer forces conduct additional construction or other technically related activities during the specific mission. Construction and technically related execution activities include—

- Implementing and maintaining a construction safety program.
- Implementing and enforcing quality controls.
- Reviewing designs and construction periodically.
- Preparing as-built drawings.
- Responding to construction contingencies.

4-25. Considerations for establishing base camps include the size of the force that is projected to operate from the base camps, the base camp duration, and the level of construction standards to be applied. Other important parameters include the geographic location, weather, construction materials available, resources, utilities, political concerns for permanency, localized environmental hazards and health threats, and the impact on the local population. (See ATP 3-37.10 for more information on base development.)

4-26. During execution, corps engineers consider more than support to sustainment operations and base construction; although, these are major focuses of operational engineering. The corps engineer staff must assess division and BCT engineer operations to determine if additional resources or task organization changes are required. The corps engineer staff also monitors and assesses enemy operations to recommend effective countermeasures and enhance situational understanding. Geospatial engineering provides the foundation for the corps common operational picture. Engineers also provide input to corps boards and working groups to
integrate the engineer disciplines throughout corps operations. During execution, corps engineers may leverage FFE to provide the necessary technical expertise.

Assessment

4-27. The corps echelon assessment includes some tactical detail down to subordinate BCT levels. These assessments provide information for theater echelon operational assessments. The corps staff analyzes the situation in terms of mission variables to understand changes in conditions and objectives and maintains the staff running estimates. The corps staff continuously assesses the effects of new information on operations, updates the staff running estimates, and determines if adjustment decisions are required.

4-28. Engineer capabilities may be applied to add technical detail to the commander’s assessment. Engineer assessment and survey teams gather technically focused information on the physical environment, infrastructure, or other physical aspects of the AO. The gathering and use of relevant information add to the depth of the commander’s understanding and can provide a technical basis for measures of performance or effectiveness.

4-29. The focus of operational engineer assessment activities includes monitoring, reception, staging, onward movement, integration, and the adequacy of the sustainment base. Operational engineer forces conduct a variety of construction and other technical assessment activities that are focused on the technical aspects of the support provided. Construction activities, real estate management, and facilities engineering are evaluated for adequacy to requirements and conformance to quality standards. Construction and technical preparation activities include—

- Conducting the necessary postconstruction acceptance inspections.
- Identifying master planning activities from the project management process that have not been completed.

FORCE TAILORING

4-30. Operational planning prepares for tactical activity on the most favorable terms through adequately resourcing units and other capabilities. Commanders are challenged to generate a force that is tailored for current and anticipated missions, is flexible to changing circumstances, and fits the time constraints and lift capabilities. Identified and anticipated requirements and mission variable analysis at operational echelons drive the initial corps tailoring. Typically, the initial tailoring is shaped for the anticipated operational configuration for the corps, assigned AO, and concept for corps operations. The corps headquarters may have significant input for refining the tailored force and providing detailed considerations down to the tactical level. Due to the variance in the demands of operations, there is no set engineer force structure and a needs-based, building-block approach is used for force tailoring.

4-31. In most cases, the tailored engineer force supporting the corps echelon results from a collaborative effort among corps and theater Army engineer planners, supported GCC engineer staff, elements at DA and DOD, supporting Army and joint force providers (including the TEC and USACE), and identified subordinate echelon units. The challenge is to generate an engineer force that is tailored to the identified and anticipated requirements, time, lift, and other constraints. In many cases, leveraging reachback and other engineer capabilities mitigates the impact of these constraints.

MISSION COMMAND

4-32. A significant determination included in the force generation effort is the timing and level for engineer headquarters deployment. The corps does not have echelon-specific units other than the organic corps headquarters. Each corps has habitual associations established with engineer brigade headquarters; but each echelon of engineer headquarters units is capable, within their span of control, of serving directly under the corps headquarters in its operational configurations. The engineer brigade headquarters incorporates training focused on support to corps echelon operations. The brigade is capable of providing effective mission command of engineer operations for most contingencies where the corps headquarters is required and is the most likely headquarters to be tailored for a corps echelon engineer headquarters. For major combat operations, the corps echelon typically requires the early or phased deployment of at least one engineer brigade headquarters as the engineer brigade is best suited for integrating engineer capabilities across the
entire force. Additional engineer brigades and MEBs may be required in support of the corps and its subordinate divisions. Stability or DSCA operations vary, but most operations or contingencies that require the deployment of the corps headquarters in one of its configurations also require an engineer brigade headquarters element.

4-33. The TEC is designed for the operational command of engineer capabilities at echelons above corps level and often provides mission command of engineer operations for the joint force command if an operational engineer headquarters is required. The TEC typically serves as the senior theater or land component engineer headquarters. Corps headquarters that are operationally configured as a JFLCC may benefit from an early or phased deployment of a TEC headquarters but typically rely on the engineer brigade to provide the mission command of engineer operations. In a JTF configuration, TEC deployment may still be advantageous depending on the complexity of the JTF mission, but an engineer brigade typically provides adequate capability given the narrower span of control.

4-34. The engineer brigade is capable of developing plans, procedures, and programs for corps engineer support (including requirements determination, operational mobility and countermobility, general engineering, power generation, area damage control, military construction, geospatial engineering, engineering design, construction materials, and real property maintenance activities). The force-tailored engineer units of the brigade are responsible for infrastructure planning, development, construction, and maintenance. The brigade commander receives policy guidance from the corps based on the guidance from the theater Army and the GCC engineer staff. If the corps is configured as an intermediate tactical headquarters, a TEC is most likely providing guidance in its role supporting the theater. The brigade headquarters provides staff supervision over corps engineer operations in the AO and reinforces engineer support to subordinate corps forces. The brigade may support joint and multinational commands and other elements according to lead Service responsibilities as directed by the supported joint force command. It provides policy and technical guidance to subordinate engineer units in the AO and maintains a collaborative planning relationship with the corps, theater Army, joint force staff engineers, and TEC when appropriate.

4-35. The engineer brigade is capable of rapid deployment in modular elements to support the needs of the operational commander. These elements are capable of providing a wide range of technical engineering expertise and support and coordinating support from USACE, other Service technical laboratories and research centers, and other potential sources of expertise in the civilian community. The engineer brigade can provide mission command for the low-density and high-demand engineer assets supporting the corps (military working dogs, engineer facility detachments, bridge units). The brigade is enabled by the global reachback capabilities associated with FFE. These capabilities include technical assistance, project planning and design, contract construction, real estate acquisition, infrastructure support, and support to nation-building capacities.

United States Army Corps of Engineers Elements

4-36. A corps headquarters may also receive support through USACE FFE for an appropriately tailored forward engineer support team. The corps engineer staff officer collaborates with the theater Army engineer staff officer, theater USACE LNO, and TEC to determine the appropriate level of support. USACE FFE provides the corps with a means to access specialized engineer capabilities and contract construction support.

4-37. USACE support provides for technical and contract engineer support, integrating its organic capabilities with those of other Services and other sources of engineer-related reachback support. USACE may have assets directly integrated into the military mission command structure and linked to a TEC or senior engineer headquarters or already be operating under contract in the theater. Whether providing construction contract and design support in the AO or outside of the contingency area, USACE can obtain the necessary data and research and can provide the specialized expertise needed (expertise that is not present in the theater through teleengineering and other reachback capabilities).

4-38. USACE expertise may support corps level engineer planning and operations and can leverage reachback to technical subject matter experts in districts, divisions, laboratories, centers of expertise, other Services, and private industry in its role as part of the generating force. Teams can rapidly deploy to meet the requirements for engineering assessments and analyses in support of the full array of engineer operations. Forward engineer support teams provide support to primarily general engineering efforts through
forward-deployed engineer elements that can access teleengineering kits and reachback to technical experts within USACE. Engineer facility detachments from TECs provide a wide variety of services to forward-deployed forces in a public works capacity. Infrastructure assessment and base development teams are nondeployable capabilities that are available through reachback support.

**Engineer and Multifunctional Forces**

4-39. The units that make up the corps echelon engineer force are diverse with technical skills that range from highly specialized to multifunctional and sourcing (including Army, joint, and multinational force providers). Corps engineer planners are challenged to comprehensively identify current and future requirements across the range of organizational skill sets. Typically, operational priorities and substantially defined, subordinate requirements are clear and the associated tasks and troop formations are evident. For operational planners, requirements for supporting subordinate echelons become increasingly ambiguous. To ensure the adequate resourcing of units, planners must consider those troop formations and tasks that are evident but also provide for flexibility to mitigate the uncertainty.

4-40. Corps echelon engineer planners must consider the general engineering capabilities tailored by the theater or other higher-echelon planners based on operational requirements that are linked to the movement and maneuver, sustainment, and protection warfighting functions (including construction requirements and a variety of specialized engineer requirements). Construction requirements will typically exceed Army unit capabilities and must be analyzed considering joint, multinational, contract, and other capabilities. Specialized requirements may require additional technical information to effectively associate with tasks and troops. FFE or reachback may be employed to guide the technical assessment needed. A more significant focus for corps echelon engineer planners will typically be adding substance to the analysis of requirements linked to the movement and maneuver, sustainment, and protection warfighting functions. Consideration includes airborne- or air assault-capable elements when required to support corps or subordinate echelon forced-entry operations.

4-41. Corps engineer planners refine the tailored force required to support operational priorities and develop a more substantial understanding of the tailored force required to support lower echelons. Geospatial engineering support, though organic at each echelon down to BCT, may generate requirements for augmentation at corps or subordinate echelons. General engineering support for requirements linked to the movement and maneuver, sustainment, and protection warfighting functions at each subordinate echelon may be accepted as a corps responsibility or considered when tailoring the subordinate echelon. General engineering support as augmentation to combat engineering capabilities at lower echelons is also considered. Combat engineering requirements for each BCT and major tactical element are also considered. Each BCT includes an organic engineer company but with only minimal mobility, countermobility, and survivability support capabilities. Augmentation is typically provided in the form of additional combat and general engineering capabilities and the appropriate engineer and multifunctional headquarters elements. The type and level of augmenting capabilities likely receive a more concentrated analysis at the corps echelon than that applied in the comprehensive theater review.

4-42. When available for collaborative planning, subordinate echelon headquarters provide invaluable input for their assigned mission requirements and some operational requirements that may have been overlooked by the higher echelon. Subordinate echelon engineer units, multifunctional units, and the engineer staff supporting division and other headquarters develop an understanding through a concentrated situational analysis. The resulting view adds depth to the understanding of the engineer forces required.

4-43. The tailored engineer force supporting the corps echelon typically includes joint and multinational engineer formations. Planners mesh service capabilities with joint, multinational, interagency, and nongovernmental organizations. Corps engineer planners give significant consideration to joint engineer capabilities. When feasible, planners align joint forces with optimum capabilities (for example, Navy engineer units routinely train to support Marine forces). The optimal alignment for general engineering in support of subordinate Marine forces is Navy engineer units. Army engineers retain the capability to support Marine forces but only as a secondary option to available Navy units. Corps engineer planners collaborate with the theater Army and joint force providers to effectively align joint capabilities with requirements. Significant consideration is also given to the tactical limitations for joint engineer forces (such as the capabilities of joint engineer units) for self-mobility in a contested AO.
OTHER CAPABILITIES

4-44. With minimum joint augmentation, the corps headquarters can initiate operations as a JTF or land component command for contingencies. For sustained operations in this role, a corps is augmented according to the appropriate joint manning document. Other situations may generate requirements for individual augmentation within the tailored corps headquarters or a subordinate echelon headquarters. Similarly, the situation may require the tailoring of individual augmentees for a provisional headquarters or teams. The GCC supports subordinate joint force requirements for joint individual augmentees as available through its standing joint force headquarters. As requirements exceed the GCC capabilities, they are passed to joint force providers.

4-45. An engineer is typically assigned to the staff of provincial reconstruction teams. This engineer may be an assigned individual augmentee. This engineer trains and advises HN engineers who are working on provincial development projects. Engineers assist the provincial reconstruction development committee with project assessments, scope-of-work statement designs for contracts with local companies, site supervision, and project management (including quality assurance and surveillance). This engineer advises the provincial reconstruction team leader on reconstruction projects and development activities in the province.

4-46. Commanders may use an operational-needs statement to document an urgent need for a material solution to correct a deficiency or to improve a capability that impacts mission accomplishment. The corps echelon engineer staff may become involved in the review and processing of engineer-related statements in support of the process of the theater Army echelon or to meet its own administrative control responsibilities. Examples of engineer-related operational needs may include bridging or construction equipment, EH clearance improvements, and other nonstandard capabilities. (See AR 71-9 for information on processing operational-needs statements.)

4-47. Corps echelon engineers must understand contingency construction authorities and the associated funding to meet the construction requirements and activities in support of contingency operations. Corps and theater Army echelon engineer staff collaborate and consult legal and financial management personnel for the latest definitive guidance.

ECHELON RELATIONSHIP TO ACTIVITIES

4-48. The corps echelon maintains an operational perspective but typically focuses on an assigned major operation or contingency. The character of most major military operations is likely to evolve and vary with time. Major combat is typically composed of many smaller conflicts conducted simultaneously. The corps should be involved in a single theater at a time.

4-49. Corps echelon forces are tailored with a mix of land combat power that is effective for any combination of offensive, defensive, and stability or DSCA operations as part of an interdependent joint force. Since the corps spans the operational to tactical level perspectives, corps echelon engineer operations include operational engineering efforts that simultaneously support offensive, defensive, and stability or DSCA operations and tactical engineer operations that are significantly influenced by the distinct operational element that they support (for example, the corps engineer perspective may include the application of engineering efforts to repair and upgrade a road influenced significantly by the technical aspects of engineering tasks). Simultaneously, from a tactical perspective, the corps may control the major combat operations of its subordinates (for example, the corps may be supporting gap-crossing requirements for a subordinate element conducting an attack). The distinct characteristics in offensive operations shape and constrain the engineering tasks that support the gap crossing. Even though operational applications are more technically influenced, corps echelon engineer operations at the operational and tactical levels must remain integrated within the combined arms framework.

4-50. The corps echelon orchestrates and sustains the tactical actions employed to achieve operational objectives. Engineer combat power applications are key enablers in achieving objectives for any combination of operational elements. The corps echelon engineer staff is integral to orchestrating, sustaining, and enabling tactical engineer actions; but the focus for operational engineer applications is significantly influenced by the technical aspects of the tasks. The corps engineer staff officer may rely significantly on a supporting engineer headquarters unit and FFE element for conducting and controlling these applications.
4-51. Offensive operations defeat enemy forces that control important areas or contest the authority of the HN government. A movement to contact develops the situation and establishes or regains contact. This task is performed by Army forces, and it creates favorable conditions for subsequent actions. Movements to contact include search and attack operations and cordon and search operations. An attack destroys or defeats enemy forces, seizes and secures terrain, or both. Attacks require maneuver supported by direct and indirect fires. Success depends on skillfully massing the effects of combat power. Exploitation rapidly follows a successful attack and disorganizes the enemy in depth. Exploitations seek to expand an attack to the point where enemy forces have no alternatives but to surrender or flee. A pursuit is designed to catch or cut off and destroy a hostile force that is attempting to escape. Pursuits often follow successful exploitations; however, pursuits can develop at any point when enemy forces are beginning to disintegrate or disengage. (See FM 3-90.1 for more information on offensive tasks.)

4-52. During offensive operations, engineer units tend to have command relationships to maneuver commanders. OPCON is the most common command relationship for engineers during offensive operations. It provides the gaining commander with the flexibility of a command relationship without the burden of administrative control responsibilities. Although the forms of offensive maneuver have different intentions, the planning phase must begin with predicting the intent of the adversary through a thorough understanding of the threat, threat engineer capabilities, and terrain effects on operations. Geospatial products and information become the foundation and common reference for planning. Threat disposition knowledge is especially critical and required for an infiltration or penetration due to the requirements for stealth and surprise. Engineer planning tends to focus on mobility support (including a robust reconnaissance effort). A greater degree of planning is required for a penetration from the breach to the ultimate control of the decisive objective.

4-53. An enemy offensive operation may compel forces to conduct major defensive operations, which may require defeating or preventing attacks across international borders, defeating conventional attacks, or halting the mobilization of an insurgent movement. Defending commanders combine these tasks to fit the situation. In a mobile defense, the defender withholds a large portion of available forces to use as a striking force in a counterattack. As enemy forces extend themselves in the defended area and lose momentum and organization, the defender surprises and overwhelms them with a powerful counterattack. In an area defense, commanders closely integrate mobile patrols, security forces, sensors, and reserves to cover gaps among defensive positions. In retrograde operations, some units conduct area or mobile defenses and security operations to protect other units that are executing carefully controlled maneuver or rearward movement. Static elements fix, disrupt, turn, or block attackers and gain time for other forces to pull back. Mobile elements constantly maneuver to confuse the enemy and prevent enemy exploitation.

4-54. Retrograde operations involve organized movement away from the enemy (including delays, withdrawals, and retirements). Retrograde operations—

- Gain time.
- Preserve forces.
- Place the enemy in unfavorable positions.
- Avoid combat operations in undesirable conditions.

4-55. The primary defensive tasks use mobile and static elements. In mobile defenses, static positions help control the depth and breadth of the enemy penetration and retain ground from which to launch counterattacks. In area defense, commanders closely integrate mobile patrols, security forces, sensors, and reserves to cover gaps among defensive positions. In retrograde operations, some units conduct area or mobile defenses and security operations to protect other units that are executing carefully controlled maneuver or rearward movement. Static elements fix, disrupt, turn, or block attackers and gain time for other forces to pull back. Mobile elements constantly maneuver to confuse the enemy and prevent enemy exploitation.

4-56. Planning for defensive operations is linked to offensive operations and, for planning purposes, must consider the transition from offensive operations and the follow-on offensive operations. During defensive operations, engineers use terrain products to describe the best position for units. Engineers then work with the intelligence staff to describe the threat characteristics and predict where the threat is likely to attack friendly forces. Engineers work in conjunction with intelligence personnel to determine which sensor capabilities to leverage and how to best predict and prevent the threat from maneuvering freely into the defended area. Construction planning includes security and survivability considerations. The consideration
of counterattack planning or support for the mobile strike force is the same as the typical mobility planning for offensive operations. The engineer staff officer works with the other staff members to ensure that the counterattack force can mass its effects on the enemy for decisive operations. The type of defensive operation defines the amount and focus of engineer effort required. Support relationships for engineer units to maneuver commanders are preferred to maximize the application of limited assets. An area defense typically requires a greater amount of effort due to the increased survivability requirements. The effort of a mobile defense has, to a lesser degree (although mobility requirements may increase), greater flexibility and takes advantage of the terrain in depth. During defensive operations engineer units tend to support the maneuver commander; however, combat engineers are task-organized to the reserve or the mobile strike force.

4-57. Planners must consider the transition from combat operations to follow-on stability operations. Stability operations are designed to establish a safe and secure environment and facilitate reconciliation among local or regional adversaries. Stability operations can also establish political, legal, social, and economic institutions and support the transition to legitimate local governance. The combination of tasks performed during stability operations depends on the situation. Army forces perform primary stability tasks. Civil security involves protecting the population from external and internal threats. Ideally, Army forces defeat the external threats posed by enemy forces that can attack population centers and simultaneously assist HN police and security elements as the HN maintains internal security against criminals and small hostile groups. In some situations, there is no adequate HN capability for civil security and Army forces provide civil security. Civil security is required for the other stability tasks to be effective. Civil control regulates selected behavior and the activities of individuals and groups. This control reduces risk to individuals or groups and promotes security. Civil control channels population activities to allow provisions of security and essential services while coexisting with a military force conducting operations. Army forces establish or restore the most basic services and protect them until a civil authority or the HN can provide them. Normally, Army forces support civilian and HN agencies. When the HN cannot perform its role, Army forces may provide the basics directly. Essential services may include providing—

- Emergency medical care and rescue.
- Epidemic disease prevention and treatment measures.
- Food and water.
- Emergency shelter.
- Basic sanitation (sewage and waste disposal).

4-58. Stability operations establish conditions that enable actions by civilian and HN agencies to succeed. By establishing security and control, stability operations provide a foundation for transitioning authority to civilian agencies and eventually to the HN. Once this transition is complete, commanders focus on transferring control to a legitimate civil authority according to the desired end state. Support to governance may include support for the—

- Transitional administrations.
- Development of local governance.
- Anticorruption initiatives.
- Elections.

4-59. In stability operations, engineers assess the operational area and focus on different aspects of the terrain and friendly and threat capabilities. Terrain products continue to have a great deal of importance, but political and cultural considerations may be more important than strictly a combat terrain analysis. Terrain analysts work with the intelligence staff to develop usable products for the commander to reflect this information, if available. Support relationships for engineer units to maneuver commanders are employed to maximize the application of limited assets. When analyzing the troops available, the engineer staff officer should consider if there are HN, third party, or nongovernmental organizations or other multinational forces involved with engineer capabilities. Interaction with these other parties requires engineers to address interoperability, common standards, and mutual agreements. Engineers should also plan for engineer units operating amongst civilians or in conjunction with nongovernmental organizations and other international organizations. Engineer elements may be tasked with managing capacity-building programs (military and civilian) during stability operations. The engineer staff of EAB assess the technical capacity and include consideration for those requirements when conducting stability operations.
4-60. Provincial reconstruction teams may be employed as part of a long-term effort to transition the functions of security, governance, and economics to provincial governments. The provincial reconstruction team is a potential combat multiplier for EAB engineer efforts that support stability operations. The provincial reconstruction team provides expertise to programs designed to strengthen infrastructure and the perception of local governments. The provincial reconstruction team focuses on developing an institutional capacity for governance, security, and reconstruction. An assigned engineer on the staff of the provincial reconstruction team assists in developing the provincial reconstruction team economic development work plan (including assistance projects). The provincial reconstruction team emphasizes the construction of infrastructure (including schools, clinics, community centers, utilities [power, water, and waste management], and government buildings). The provincial reconstruction team also focuses on developing human capacity through training and advisory programs.

4-61. Contract construction through USACE contingency elements is often employed in stability operations to assist in the restoration of the HN infrastructure. Through warranted contract construction, USACE can establish and repair large facilities (such as road networks, hospitals, schools, and ports). The USACE LNO or JTF engineer staff officer assists in planning for anticipated contract construction early in the operation to support requirements.

4-62. Although the U.S. Northern Command maintains a standing JTF for operations in the United States, a corps headquarters may be required to provide DSCA support. DSCA operations address the consequences of natural or man-made disasters, accidents, and incidents within the United States and its territories. Army DSCA operations include primary tasks. Policies issued by the federal government govern the essential services that Army forces provide in disaster response. (See ADP 3-28 for more information on DSCA operations.) Essential services may include providing—

- Rescue.
- Emergency medical care.
- Epidemic diseases prevention and treatment measures.
- Food and water.
- Emergency shelter.
- Basic sanitation (sewage and waste disposal).
- Minimum-essential access to affected areas.

4-63. Army forces work directly with state and federal officials to help restore and return the control of services to civil authorities as quickly as possible. As a result of disaster or attack, state and local government capacities may be reduced or overextended. Army forces provide mission command, protection, and sustainment to governmental agencies at all levels until these governments can function normally. When authorized and directed, Army forces provide support to local, state, and federal law enforcement officers. In extreme cases, and when directed by the President, Regular Army forces maintain law and order. The Army is frequently called upon to provide other support to civil authorities apart from disaster response and law enforcement. Most of this support is identified well in advance and planned with civil authorities. Much of the support is routine; it consists of providing support to communities surrounding the home stations of the Army units. Examples of other types of support provided to civil authorities include the following—

- Supporting state funerals.
- Participating in major public sporting events.
- Providing military equipment and Soldiers to community events.

4-64. Planning for DSCA operations is significantly different from offensive, defensive, or stability operations because of the unique nature of the threat. Although the basic missions may be very similar to those of stability operations, DSCA operations are similar to stability operations in that they interact with the local population and civil authorities. Engineer tasks are similar but within a domestic versus foreign environment. The focus of engineer capabilities on essential services is similar in stability and DSCA operations. In most stability operations, materials and capabilities are typically scarce after a natural disaster or conflict; however, in most DSCA operations these materials and capabilities are plentiful. The Army is typically called upon to help states facilitate the orderly movement of manpower and material from the civilian sector. Engineer planners consider statutes and regulations that restrict the interaction of the Army
with other governmental agencies and civilians during DSCA operations. The local and state response normally leads the effort with a federal response providing support as required.

4-65. Army commanders assume a support role to one or more of the designated agencies. The deploying headquarters is likely configured as a JTF and interacts directly with the designated lead agencies. Disaster operations are normally conducted in four phases (planning, response, recovery, and restoration). The role of the military is most intense in the planning and response phases and decreases steadily as the operation moves into the recovery and restoration stages.

4-66. Engineers are involved in planning for the support of relief operations with geospatial products and the analysis of potential areas to establish life-support areas. Engineers may be called on to provide manpower support or general engineering support from units with unique capabilities (temporary shelter, power generation, firefighting). USACE and other engineer capabilities of the generating force typically have a prominent role in DSCA operations. The engineer staff officer may leverage coordination with USACE elements involved in DSCA operations to add depth to the understanding of the operational environment and to access reachback support.

4-67. Restoration is the return of normalcy to the area. The corps would disengage before complete restoration. As civil authorities assume full control of the remaining emergency operations and normal services, the corps transfers those responsibilities to replacement agencies and begins redeployment from the area. During restoration, the engineer staff officer assists the corps commander in considering disengagement criteria and redeployment plans while recovery continues in the affected area.

OPERATIONAL CONFIGURATIONS

4-68. The primary mission of a corps headquarters is to serve as a base on which a GCC can build a JTF headquarters. The secondary mission of the corps is to serve as a JFLCC headquarters. Both of these missions involve the provision for operational mission command and the integration and synchronization of joint, interagency, and multinational actions within a JOA. Serving as an intermediate-level tactical headquarters during major combat operations is a tertiary mission for a corps headquarters.

4-69. The modular corps headquarters design promotes joint and multinational operational planning efficiency. It ensures that the corps headquarters has essential mission command capabilities while remaining rapidly deployable to the GCC area of responsibility to provide mission command for Army, joint, and multinational forces engaged in operations; and the design is tailored for the needs of the area of responsibility. The basic design includes—

- An ASCC organized around one main command post and one tactical command post.
- A commander with a mobile command group.
- A corps special troops battalion that provides life support and network support to the headquarters.

4-70. The corps normally tasks its subordinate units to provide security assets for each command node based on mission variables. Alternatively, security could be provided by multinational, HN, or contracted assets. Regardless of its source, the corps headquarters security elements come under the control of the corps special troops battalion commander.

4-71. In every operational configuration, the theater Army headquarters retains its responsibilities as the ASCC. The corps has an ASCC that includes regional expertise, is tailored for the needs of the area of responsibility, and provides the corps with a degree of higher-echelon support in its operational configurations regardless of whether the corps is also functioning as the headquarters of Army forces. While some support or other administrative control responsibilities are placed on the corps headquarters, it functions with a more singular focus on the contingency or major operation than the theater Army headquarters.

JOINT TASK FORCE

4-72. A corps headquarters provides a base structure on which a JTF headquarters can be built for a smaller-scale contingency without additional initial Army augmentation. Normally, this occurs when the forces involved are land units, and it does require joint augmentation. Joint manning may be provided by the GCC or others (such as a joint manpower exchange program). The theater Army normally provides a corps-
Corps Echelon Engineer Operations

based JTF headquarters with elements from the theater sustainment command, theater signal command, and other theater level functional organizations. While acting as a JTF headquarters, the corps headquarters should not also be the Army force headquarters due to the wide difference in roles and responsibilities between a JTF and an Army force headquarters. This means that two separate staffs are required in most circumstances. The corps headquarters uses joint doctrine and procedures when acting as a JTF headquarters.

4-73. With minimum joint manning (about 20 other Service officers), the headquarters is capable of initiating operations as a JTF, including—

- Initiating joint campaign planning.
- Deploying the corps early-entry command post and advance elements to establish initial mission command capabilities in the JOA.
- Initiating shaping operations.
- Coordinating with the HN and multinational partners within the JOA.

4-74. Figure 4-3 shows a corps configured as a JTF headquarters. Sustained joint operations may require additional joint personnel. The expeditionary sustainment command post may support Army and joint forces. The deputy commanding general of the corps is routinely assigned the responsibilities outlined in JP 3-10.

![Figure 4-3. Corps headquarters as a JTF headquarters](image)

Legend:

- ADCON: administrative control
- JFAC: joint force air component
- JFLC: joint force land component
- JFMC: joint force maritime component
- JFSOC: joint force special operations
- JTF: joint task force
- MAGTF: Marine air-ground task force
- SJFHQ: standing joint force headquarters
- sust: sustainment
- TSC: theater sustainment command

4-75. Unlike the theater Army-formed JTF, the corps configured as a JTF does not require a separate engineer staff officer. The corps engineer staff officer transitions to become the JTF engineer staff officer and does not have additional responsibilities associated with Army forces. Similarly, the corps-formed JTF should only require engineer headquarters units to support the JTF, a TEC element, or an engineer brigade for the operational mission command of JTF engineer support. The theater Army continues its ASCC functions and may require an engineer battalion or brigade to provide mission command for engineer operations supporting those functions. The JTF engineer staff officer also employs an assigned or supporting USACE FFE element to access additional technical and contract construction capabilities.
JOINT FORCE LAND COMPONENT COMMAND

4-76. The corps headquarters is also designed to provide the headquarters on which a JFLCC or combined force land component headquarters can be built (see figure 4-4). This headquarters can exercise OPCON over land forces in a campaign or major operation. This may include controlling multiple Army, U.S. Marine Corps, and multinational division- and brigade-sized formations. The composition of the headquarters should roughly reflect the composition of the joint and multinational land forces involved. While acting as a JFLCC headquarters, the corps headquarters also performs the duties of an Army force headquarters. Like the operational command post of the theater Army, the corps uses Army doctrine and procedures but refers to joint doctrine for a list of duties when tasked to perform as a JFLCC headquarters.

![Diagram of joint force land component command](image)

**Legend:**
- combatant command
- tactical control/operational control/attached
- administrative control
- ARFOR Army forces
- JFAC joint force air component
- JFLC joint force land component
- JFMC joint force maritime component
- MAGTF Marine air-ground task force

**Figure 4-4. Corps headquarters as a joint force land component headquarters**

4-77. The corps headquarters commands Army forces assigned or attached to the JTF except those assigned or attached to the JFLCC, U.S. Marine Corps, or multinational formations. As an Army force headquarters, the corps headquarters coordinates administrative control for Army forces within its JOA and provides Army support to other Services, governmental agencies, and multinational forces as required by the joint force commander. An Army forces commander may not have OPCON of all Army forces provided to the joint force command; however, the Army forces commander remains responsible for their administrative control.

INTERMEDIATE TACTICAL HEADQUARTERS

4-78. Large land forces require an intermediate echelon between the divisions that control BCTs and the theater Army serving as the land component command. Other factors that require an intermediate headquarters include—
- Mission complexity.
- Multinational participation.
- Span of control.
4-79. In major combat operations, the corps may be tasked to be an intermediate land tactical headquarters under JFLCC (see figure 4-5). The complexity, span of command, or multinational considerations may require the use of a second tactical controlling EAB. When required, the Army tailors the theater Army with a corps headquarters to serve as this intermediate tactical level. As the major combat operation transitions to a protracted stability operation, the corps headquarters may become the joint force headquarters or multinational land component headquarters. When the corps is acting as an intermediate-level tactical headquarters, it employs Army doctrine and procedures and may be designated as the Army force headquarters with responsibility for the administrative control of Army forces.

Legend:
- CA civil affairs
- JFAC joint force air component
- JFC joint force command
- JFLC joint force land component
- JFMC joint force maritime component
- JFSOC joint force special operations component
- MDSC medical deployment support command
- MEF Marine expeditionary force
- MI military intelligence
- TSC theater sustainment command

Figure 4-5. Corps headquarters as an intermediate tactical headquarters

4-80. When performing an intermediate tactical headquarters task, the headquarters role involves requesting and tailoring its available division headquarters and modular brigades for land operations in support of the joint force command. The corps headquarters assigns a command or support relationship between its available BCTs by assigning support brigades to available division headquarters, or the corps commander may choose to retain direct control of selected brigade-size elements. Battles and engagements are tactical functions that are exercised through the BCT and supporting brigade headquarters and monitored by division headquarters. The corps headquarters focuses on shaping the future battlefield and setting the conditions that allow the success of subordinate tactical units. This capability relieves the JFLCC or the GCC of the requirement for planning and synchronizing multiple land operations conducted by very large formations (two or more divisions).
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Chapter 5

Division Echelon Engineer Operations

Divisions are the primary tactical warfighting headquarters of the Army. Their principal task is directing subordinate brigade operations. The division headquarters structure is designed to exercise mission command over any mix of brigades. This chapter focuses on engineer operations at the division echelon. It describes foundational characteristics and considerations for engineer operations supporting the division. It discusses engineer integration within the operations process conducted by the division headquarters. It examines specific considerations for force-tailoring engineer units and capabilities at the division echelon. It also examines considerations unique to each decisive action element from the division perspective. This chapter describes the specific engineer considerations for each operational configuration of the division headquarters.

INTEGRATION

5-1. A division is the primary tactical warfighting headquarters for the Army. Its primary role is as a tactical headquarters exercising mission command of BCTs and supporting brigades in decisive action. Depending on the mission, enemy, terrain and weather, troops and support available, time available, and civil considerations, the division commands between two and five BCTs and a mix of modular brigades. The division combines offensive, defensive, and stability or DSCA tasks in an AO that is assigned by its higher headquarters, normally a corps. The division task-organizes its subordinate forces according to mission variables to accomplish its assigned mission (see FM 3-94).

DIVISION PERSPECTIVE

5-2. The division headquarters may serve as a joint force land component headquarters with staff augmentation in a smaller-scale contingency or as an Army force headquarters without additional Army (primarily for operational tasks) in smaller-scale contingencies augmentation. With extensive augmentation, the division may serve as a JTF for a small contingency. When serving as the JFLCC or JTF, the division is primarily concerned with operational tasks. The theater Army provides most of the administrative control and Army support to forces deployed in the JOA. Joint manning documents determine other Service officer and noncommissioned officer augmentation required by the division staff for duties as a JTF or JFLCC headquarters. When serving as a JTF headquarters, the division headquarters organizes and operates according to joint doctrine. (See JP 3-31 for more information on the JFLCC and JP 3-33 for more information on the JTF.) During operations, the division synchronizes and integrates the warfighting functions primarily from the tactical perspective.

5-3. Operational commanders seek to create the most favorable conditions possible for division employment. The division meets the joint force commander’s need for a tactical command that is capable of translating design into concept and decisions into action. The division synchronizes forces and warfighting functions in time, space, and purpose to accomplish missions. The division perspective is substantially shaped by the operational approach described by the theater and is focused on the tactical actions inferred from that approach. The division echelon engineer perspective similarly includes a solid operational foundation from which to focus on the detailed, tactical requirements for a selected operation (see figure 5-1, page 5-2).
5-4. At the division echelon, the engineer staff officer and other engineer staff assist in understanding and translating Army design methods into a division concept of operations. The division engineer staff analyzes the operation and begins to concentrate on COAs for arranging forces in relation to each other and employing combat power to accomplish the mission. Just as corps echelon engineers validate analysis supporting the operational engineer design, the divisional engineer analysis adds detail or offers new information for operational consideration. Ultimately, as operational engineers refine and address requirements at their echelon, division echelon engineers gain an understanding of the operational requirements that must be included in division operations. Division echelon engineers concentrate on the substantial development of engineer requirements and the capabilities necessary to the division concept of operations. The divisional engineer analysis is operationally broad enough to include general and geospatial engineering support that is not included in Army design methods. The analysis is more comprehensive and detailed in considering and shaping combat, general, and geospatial engineering requirements for arranging and employing divisional forces. Figure 5-2 shows an example of how the division echelon engineer integrates tactical engineer actions through warfighting functions to support the division concept of operations.
5-5. As the concept of operations develops, the division engineer staff collaborates with the corps or theater Army engineer staff, the supporting engineer and multifunctional headquarters, and the subordinate echelon engineer staff to refine the engineer support received from higher echelons and to clearly define the division echelon engineer actions required. The concentration of the division engineer staff on the detailed capabilities and actions required to support division operations adds significant depth to the operational engineer concept. Similarly, engineer and multifunctional unit headquarters identified as divisional forces bring additional capacity for developing engineer support concepts. When subordinate BCTs are identified and available for collaborative planning, divisional engineers gain greater depth through the BCT engineer staff.

5-6. The division engineer staff officer’s running estimate provides a working compilation of relevant information that is primarily focused on the physical environment within the division AO with a comprehensive accounting for engineer units, capabilities, and other resources tailored for the operation. The running estimate is built on input from the corps or theater Army engineer’s initial assessments and is further developed with consideration to mission variables. The division level running estimate evolves with the development of the division concept of operations. The division engineer staff officer’s running estimate connects challenges with available support. The running estimate can be organized according to engineer discipline and warfighting function as shown in figure 5-2. The running estimate is continuously refined and updated as additional assessments are made, guidance and priorities are refined, and actions are fulfilled. (Appendix C provides information for use in developing and maintaining the engineer running estimate.)
5-7. The theater Army tailors the division headquarters to meet mission requirements. Though some refined operational guidance is required based on the divisional analysis of the situation, the division engineer and other staff planners enter the operations process with established Army design methods. The division level analysis of the situation, based on mission variables, enables the division commander’s initial understanding. The commander’s understanding forms the basis for visualization, which may be expressed in division planning guidance. This planning guidance is a reflection of how the commander envisions the operation unfolding. It provides a broad description of when, where, and how the commander intends to employ combat power within the higher commander’s intent. Planning guidance also contains priorities for each warfighting function.

5-8. The division engineer may begin shaping engineer operations by understanding and influencing the commander’s initial priorities. This effort requires an understanding of the operational engineer support responsibilities defined by the theater echelon and the GCC. As division engineer planners validate higher-echelon support, this support is adjusted or refined accordingly. The commander’s guidance on priorities during the planning process provides the engineer planner with an improved understanding to influence those engineering priorities as necessary.

5-9. For major operations or contingencies, the division will likely face a unique theater or JOA. While the discussion and comparison of development levels are from a division perspective, the GCC and theater Army typically expend some effort in mitigating the impact of those differences on the division operation. In many cases, the division inherits an accessible theater with a developed or developing sustainment base and real estate already acquired or in acquisition. Typically, the division participates in and continues base development that is already in progress. (See ATP 3-37.10 for more information on base camps.) Standards are likely established, but some refinement may be necessary. Division echelon engineers refine construction standards during operations and during the closure or transfer of a base, base camp, or other facility as operations conclude. In unique circumstances, division echelon engineers may be presented with a broader assortment of engineer requirements when the operational area is underdeveloped.

5-10. Engineer operations act as one of many key enablers as the division commander employs combat power to achieve objectives. To be effective as an enabler, the engineer staff must be integrated in the effort to assist the commander in formulating the concept of operations. Engineer disciplines assist in organizing capabilities, which are integrated through warfighting functions in the synchronized application of combat power. The division engineer staff officer and other engineer staff integrate efforts through the operations process to refine operational engineer support and to develop the division concept of engineer operations.

**Operations**

5-11. In most situations, the division echelon takes on established Army design methods from the corps, theater Army, or GCC. Division echelon commanders must recognize the elements of Army design methods to understand design and translate it into a supporting concept of operations. The division echelon staff must also recognize the elements of Army design methods to participate in the refinement of the concept of operations (see ADRP 5-0). Division echelon commanders and their staffs use more objective and task-focused problem solving to develop the detailed division concept of operations. The resulting concept of operations forms the basis for developing the operation plan or order. During execution, division commanders and staffs assess the situation and adjust current and future actions as the operation unfolds.

5-12. For division level engineer staff, the cyclic activities of the operations process may be sequential or simultaneous. Division commanders use the operations process to help them decide when and where to make decisions, control operations, and provide command presence. Throughout the operations process, the division staff synchronizes forces and warfighting functions to accomplish missions. The division level engineer staff synchronizes the application of engineer disciplines through the warfighting function framework by integrating it into the operations process.

**Planning**

5-13. In smaller-scale operations, a division may be configured as a JTF or JFLCC and be required to influence Army design methods. At the operational level, a subordinate joint force commander develops supporting plans, which may include objectives supported by measurable operational effects. Joint
Division Echelon Engineer Operations

interdependence requires that division headquarters understand joint doctrine that addresses these planning
techniques. (See JP 3-34 for more information on joint planning.)

5-14. The division echelon engineering effort requires consideration of the engineer requirements linked
through the warfighting functions to the division concept of operations. Division echelon engineer planners
assist in determining the specific objectives and detailing the tasks required to achieve those objectives. The
planners use the commander’s intent to develop and refine COAs that contribute to achieving objectives in
the AO. They concentrate on supporting the division concept of operations and collaborate to gain depth for
their view of the operational environment and to add to their planning and problem-solving capability.
Collaboration extends to corps or theater Army echelon and to the tailored subordinate engineer units and
staff.

5-15. The MDMP is the primary tool for deliberate planning. Division engineer planners and their staff
participate in the MDMP to translate the commander’s visualization into a specific COA for preparation and
execution. Engineer operations also involve using some functionally unique analytic tools to solve
construction, design, facilities, and other engineer challenges. As planning proceeds through the MDMP,
engineers rely heavily on the analytic techniques that support design and project management to guide
functional problem solving. These techniques demand technical information, which may be available from
existing assessments or may require additional assessments or surveys. The support available through
reachback or collaborative planning may be used to focus on technical details.

5-16. The division commander (aided by their engineer staff) exercises control over engineer forces in the
division AO. The staff aids with control and keeps the commander informed. The division echelon engineer
staff establishes the following:

- Engineer unit missions and tasks.
- Engineer task organization and command and support relationships.
- Obstacle integration and control measures.

5-17. The division staff identifies missions, allocates resources, and synchronizes and controls engineer
actions. In defensive operations, the engineer running estimate incorporates the obstacle planning process.
The division echelon perspective provides a pivotal linkage from obstacle integration (coordinated by lower
echelons) to obstacle control (established at higher echelons). Divisions, brigades, and task forces plan
obstacle zones, belts, and groups. In some cases, corps may designate obstacle zones; but normally, obstacle
zone planning is initiated by the division. Obstacle control measures enable tactical obstacle placement while
synchronizing the obstacle effort with future plans. The obstacle control measures focus obstacle effort on a
specified area and guide the desired obstacle effect (disrupt, turn, fix, and block). (See ATP 3-90.8 for more
information on obstacles.)

5-18. The result of the MDMP is a plan or order that provides subordinates with the information they need
for execution. Engineer planners provide input to the appropriate paragraphs, annexes, and appendixes for
the joint or Army format. The division engineer staff continues to collaborate and assist subordinate unit
staffs with their planning and coordination.

Preparation

5-19. Division preparation consists of activities performed by units before execution to improve the division
ability to conduct operations. Preparation requires staff, unit, and Soldier actions. Mission success depends
as much on preparation as it does planning. Rehearsals help staffs, units, and individuals to better understand
their specific role in upcoming operations, practice complicated tasks before execution, and ensure that
equipment and weapons function properly. Key preparation activities include—

- Plan revision and refinement.
- Rehearsals.
- Task organization.
- Surveillance and reconnaissance.
- Training.
- Troop movements.
- Preparation checks and inspections.
• Sustainment preparations.
• New Soldier integration.
• Reception, staging, onward movement, and integration.
• Subordinate confirmation backbriefs.

5-20. In many cases, engineer units conduct these preparation activities integrated within the combined arms task organizations required by the operation. Combined arms rehearsals are critical to the success of a breaching, clearing, or gap-crossing operation. Similarly, engineer reconnaissance teams can be employed as integrated elements in a combined arms reconnaissance formation. In every case, engineer reconnaissance efforts must be integrated within the information collection plan. At the division echelon, some specific engineer preparation considerations may include—

• Integrated engineer participation in combined arms planning, backbriefs, and rehearsals before the operation, this includes the construction of mock-up, complex obstacle systems and other terrain features that may be encountered and allowing integrated combined arms breaching rehearsals.
• Geospatial engineering support that provides analysis and terrain products for routes that assist planners in the intelligence preparation of the battlefield. Engineer planners may focus on these products to help identify obstacle and bypass locations or other relevant information in the physical environment.
• Completion of directed obstacle zones and reserve demolition obstacles, this includes deconflicting subordinate obstacles and other engineer actions to ensure that there is mutual support and access for division forces.
• Staging engineer units in forward positions with other combined arms units to enable execution at the desired tempo.
• Engineer participation with route reconnaissance forces, ensuring that follow-on engineer forces are task-organized to meet the mobility requirements needed to keep the maneuver force moving.
• Pre-positioning bridge stocks and obstacle breaching materials for effective employment during the operation.
• Material and munitions preparation and loading for effective employment during the operation.
• Construction of forward logistics bases and main supply routes, when feasible, to enable uninterrupted sustainment during the operation.

5-21. The division engineer reviews and refines operational engineer support. From the operational perspective, construction activities, real estate management, and facilities engineering are dominant during preparation. Operational engineer preparations include addressing requirements for facilities and may include the establishment of working groups, boards, or cells to solve problems and coordinate actions.

Execution

5-22. During execution, the commander’s visualization helps commanders make decisions. Commanders and their staffs continuously assess the progress of operations toward the envisioned end state and modify orders, as required, to accomplish the mission. Situational understanding forms the basis for the commander’s visualization.

5-23. Execution involves monitoring the situation, assessing the operation, and adjusting the order as needed. Throughout execution, commanders continuously assess operation progress based on information from the common operational picture, running estimates, and assessments from subordinate commanders. When the situation varies from the assumptions that the order was based on, commanders direct adjustments to exploit opportunities and counter threats. The engineer unit commander’s staff and the combined arms commander’s engineer staff assist in execution through integration processes and continuing activities during execution (see ADRP 5-0). In addition, commanders and their staffs perform the following activities specific to execution:

• Focus assets on the decisive operation.
• Adjust the commander’s critical information requirements based on the situation.
• Adjust control measures.
• Manage the movement and positions of supporting units.
• Adjust unit missions and tasks as necessary.
• Modify the concept of operations as required.
• Recommend the position of or relocate committed, supporting, and reserve units.

5-24. As with preparation, engineer forces conduct additional construction or other technically related activities during the execution of the specific mission. Construction and technically related execution activities include—
• The implementation and maintenance of a construction safety program. Implementation and enforcement of quality controls.
• The periodic design and construction reviews.
• The preparation of as-built drawings.
• A response to construction contingencies.
• Geospatial database replication and synchronization.

5-25. The division engineer continues to refine the plan for operational engineer support (including construction that supports operational sustainment, considerations for the establishment of types of base camps, and area damage control that is dominant during execution).

Assessment

5-26. The division echelon assessment includes tactical detail down to subordinate BCT and battalion levels. These assessments provide updates to higher-echelon operational plans. The division staff analyzes the situation in terms of mission variables to understand changes in objectives and tasks and maintain their staff running estimates. The division staff continuously assesses the effects of new information on the operation. They update their staff running estimates and determine if adjustment decisions are required.

5-27. Engineer capabilities may be applied to add technical detail to the commander’s requirements. Engineer assessment and survey teams gather technically focused information on the physical environment, infrastructure, or other physical aspects of the AO. The relevancy of the information gathered adds to the depth of the commander’s understanding and can provide a technical basis for measures of performance or of effectiveness. Engineer forces also conduct a variety of construction and other technical assessment activities focused on technical aspects of the support provided. General engineering activities are typically evaluated for adequacy to the requirements and conformance to quality standards.

FORCE TAILORING

5-28. Operational planning results in a division echelon force that is tailored for current and anticipated missions, is flexible to changing circumstances, and fits the constraints of time and lift capabilities. Identified and anticipated requirements, coupled with mission variable analysis by higher echelons, influence the initial division force tailoring. Refinements at the division level are narrowly focused on analysis bounded by the assigned mission and AO. Due to the variance in the demands of operations, there is no set engineer force structure; and a needs-based, building-block approach is used for force tailoring.

5-29. Higher echelons achieve combined arms capabilities by tailoring and task-organizing the different types of brigades and battalions under corps or division headquarters. Divisions can typically control up to five BCTs in major combat operations. Divisions can control more BCTs in protracted stability operations. A division force package may include any mix of armor, infantry, and Stryker BCTs; and each division controls a tailored array of modular support and functional brigades. In some operations, divisions may control multiple support brigades of the same type. For major combat operations, divisions should have at least one of each type of support brigade under OPCON or attached (except for sustainment brigades, which provide general or direct support to a division or corps). Divisions may also control functional groups, battalions, or separate companies; however, these are normally task-organized to a brigade.

5-30. In most cases, the tailored engineer force supporting the division echelon, in most cases, results from a collaborative effort among—
• Division, corps, and theater Army engineer planners.
• Supported GCC engineer staff.
Elements at DA and DOD.
Supporting Army and joint force providers (including the TEC and USACE).
Input from identified subordinate echelon units. The challenge is to generate an engineer force that is tailored to identified and anticipated requirements, time, lift, and other constraints. In many cases, leveraging reachback and other engineer capabilities mitigates the impact of these constraints.

### MISSION COMMAND OF ENGINEER FORCES

5-31. A significant determination included in the force generation effort is timing and the deployment level of engineer headquarters. Divisions are not fixed formations. They do not have organic engineer units and do not establish habitual associations with echelon-specific engineer headquarters units. Typically, the division is tailored with one MEB, which provides mission command for engineer operations when engineer support is integral to the MEB. The MEB mission is usually associated with owning or controlling terrain. In most cases, the addition of an engineer brigade headquarters is in addition to an allocated MEB and as a result of a mission variable analysis that indicated the requirement for increased mission command capability for engineer missions at the division level. The primary consideration for placing a functional engineer brigade at the division level is if the division has the capability to integrate and synchronize engineer capabilities across the entire division. An example is in stability operations where the MEB within a division is given an AO to control, limiting its ability to also control engineer operations. (See ATP 3-34.22 for more information on engineer operations in support of the BCT and its subordinate elements.) Table 5-1 provides a comparison of mission command capabilities, span of control, and allocation for the MEB and the engineer brigade.

### Table 5-1. Comparison of the MEB and the engineer brigade

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<th>MEB</th>
<th>Engineer Brigade</th>
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</table>
| **Capabilities** | • Provides mission command for multifunctional operations (including maneuver support, support area, incident management, and stability operations)  
• Provides a tactical command post as an early entry command post if required  
• Integrates and synchronizes engineer capability within its own AO (if assigned control of an AO) | • Provides mission command for engineer operations (including combat, general, and geospatial engineering missions)  
• Provides planning, requirements development, and contract oversight (quality assurance and surveillance) assistance for contracted construction  
• Provides two scalable, deployable command posts as required  
• Serves, with augmentation, as a joint engineer headquarters and may be the senior engineer headquarters deployed in a JOA if full TEC deployment is not required or a TEC deployable command post is not appropriate  
• Integrates and synchronizes engineer capability across the entire supported force (does not control an AO without significant augmentation) |
| **Span of control** | • Conducts multifunctional missions with a mix of modular units from detachments to battalions  
• Requires a subordinate engineer battalion headquarters for two or more subordinate engineer modules  
• Is not typically task-organized with more than two subordinate engineer battalion headquarters. | • Conducts engineer missions with up to five task-organized engineer battalions or other force pool units |
Table 5-1. Comparison of the MEB and the engineer brigade (continued)

<table>
<thead>
<tr>
<th>Allocation</th>
<th><strong>MEB</strong></th>
<th><strong>Engineer Brigade</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Has one MEB per division</td>
<td>conducting military operations, as required, in support of higher-echelon, joint, and multinational forces</td>
<td>Has one engineer brigade headquarters for up to five engineer battalions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Is mission-tailored to support corps military operations. May also be tailored in support of divisions when the functional nature of engineer missions calls for brigade level mission command capability</td>
</tr>
</tbody>
</table>

Legend:
- AO: area of operations
- JOA: joint area of operations
- MEB: maneuver enhancement brigade
- TEC: theater engineer command

5-32. Allocated engineer brigade and MEB commanders provide significant advice to the division commander and provide mission command for assigned engineer forces. The division engineer staff officer must establish and maintain a collaborative relationship with the engineer brigade, MEB commanders, and their headquarters to ensure that there is a coordinated engineer effort. Although the engineer brigade headquarters does not possess an integral capability to augment division engineer staff sections, they typically provide a significant contribution for the engineer staff officer. Depending on task organization and other mission variables, they also provide mission command for much of the tailored division engineer force conducting operations.

5-33. The MEB, one of the multifunctional brigades, is designed as a headquarters to provide mission command for those units primarily providing engineer; explosive ordnance disposal (company); military police; air missile defense; chemical, biological, radiological, and nuclear; and signal capabilities. The number of MEBs placed under the control of a division headquarters depends on the analysis of mission variables. The MEB is designed to receive and control forces, provide protection and mobility, and prevent or mitigate the effects of hostile action against divisional forces. The MEB mission is to preserve the freedom of maneuver for operational- and tactical commanders by controlling terrain and facilities and by preventing or mitigating hostile actions against the protected force. A MEB is a combined arms organization, rather than a functional brigade, that is task-organized based on mission requirements. It has a combined arms staff and mission command capabilities that suit it for a variety of missions. A MEB typically controls combinations of several different types of battalions and separate companies (chemical, biological, radiological, and nuclear; civil affairs; engineer; explosive ordnance disposal; military police; air missile defense; and a tactical combat force). The MEB has the ability to control an AO; however, once assigned an AO, its ability to synchronize engineer efforts across the force is greatly reduced.

5-34. One or more engineer brigades may be required in the division when the number of engineer units or the functional nature of engineer missions calls for a functional engineer brigade level mission command capability. The brigade span of control exceeds the engineer mission command capability of the MEB. Once deployed, engineer brigades integrate and synchronize engineer capabilities across the division AO and become the focal point for apportioning and allocating mission-tailored engineer forces within the AO. The engineer brigade is capable of supporting the division configured as a JTF or component command and providing mission command to Service engineers and contracted engineer support within an operational area. The engineer brigade or TEC can provide one or two deployable command posts with engineer staff expertise to provide mission command as required. The engineer brigade or TEC will provide engineer-specific technical planning, design, and quality assurance and control during 24-hour operations.

**FIELD FORCE ENGINEERING**

5-35. If nation building infrastructure is planned at the division level, a USACE LNO or engineer staff officer can help the division commander anticipate and plan contract construction requirements early in the operation. In addition, these LNOs can help the division commander determine which USACE elements may be operating in its AO in support of theater or corps level requirements.
5-36. In many situations, a division headquarters may receive support through USACE FFE for an appropriately tailored forward engineer support team. The division engineer staff officer collaborates with the corps and theater Army engineer staff officer, the theater USACE LNO, and/or the TEC to determine the appropriate support level.

5-37. USACE support provides for technical and contract engineer support, integrating its organic capabilities with those of other Services and other sources of engineer-related reachback support. USACE may have assets directly integrated into the military mission command structure, linked to a TEC or senior engineer headquarters, or already operating under contract in the theater. USACE can obtain the necessary data, research, and specialized expertise that is not present in the theater through teleengineering and other reachback capabilities.

5-38. USACE expertise may support division level engineer planning and operations and can leverage reachback to technical subject matter experts in districts, divisions, laboratories, and centers of expertise; other Services; and private industry in its role as part of the generating force. Teams can rapidly deploy to meet requirements for engineering assessments and analyses in support of the full array of engineer operations. Forward engineer support teams provide support to primarily general engineering efforts through forward-deployed engineer elements that can access teleengineering kits and reach back to technical experts within USACE. The detachment of engineer facilities from TECs provides a wide variety of services to forward-deployed forces in a public works capacity. Infrastructure assessment and base development teams are nondeployable capabilities available through reachback support.

ENGINEER AND MULTIFUNCTIONAL FORCES

5-39. The units that make up the higher-echelon engineer force are diverse with technical skills that range from highly specialized to multifunctional and sourcing (including Army, joint, and multinational force providers). Corps and higher-echelon engineer planners typically consider, in detail, general engineering forces and capabilities based on operational requirements linked to the movement and maneuver, sustainment, and protection warfighting functions (including construction and specialized engineer requirements). Division engineer planners are challenged to comprehensively identify combat, general, and geospatial engineering requirements linked to the movement and maneuver, sustainment, and protection warfighting functions for the division and its subordinate forces.

5-40. Division engineer planners may refine the tailored force required to support operational priorities but focus on developing a more substantial understanding of the tailored force required to support lower echelons. Geospatial engineering support, though organic at division echelon and each BCT, may generate requirements for augmentation. Corps or higher echelons may provide some general engineering support for requirements linked to the movement and maneuver, sustainment, and protection warfighting functions within the division AO; but this may need augmentation for division-identified priorities. General engineering support as augmentation to combat engineering capabilities at lower echelons must also be considered as the BCT has only limited horizontal capacity and no vertical capability. Augmentation is typically provided in the form of additional combat and general engineering capabilities and the appropriate engineer and multifunctional headquarters elements. The type and level of augmenting capabilities will likely receive a more concentrated analysis at division echelon than applied in the higher-echelon review.

5-41. When available for collaborative planning, subordinate echelon headquarters provide input for their assigned mission requirements and some operational requirements that may have been overlooked by the higher echelon. Subordinate echelon engineer and multifunctional units and the engineer staff supporting BCTs and other headquarters develop an understanding through a more concentrated analysis of the situation. The resulting view adds depth to the understanding of engineer forces required for their support.

5-42. The tailored engineer force supporting the division echelon may include joint and multinational engineer formations. Planners mesh Service capabilities with the capabilities, capacities, and limitations of unified action partners. When feasible, they align the force to optimize capabilities.

OTHER CAPABILITIES

5-43. With appropriate joint augmentation, a division can be the JTF or land component command headquarters for small contingencies. For sustained operations in this role, a division is augmented. Other
situations may generate requirements for individual augmentation within the tailored division headquarters. Similarly, the situation may require the tailoring of individual augmentees for a provisional headquarters or for provisional teams. The GCC supports subordinate joint force requirements for joint individual augmentees as available through its standing joint force headquarters. As requirements exceed the GCC capabilities, they are passed to joint force providers.

5-44. Commanders may use an operational needs statement to document an urgent need for a material solution to correct a deficiency or to improve a capability that impacts mission accomplishment. The division echelon engineer staff will likely be involved in the initial identification and documentation of such needs and the review and processing of statements through the established ASCC procedures. Examples of engineer-related operational needs may include bridging or construction equipment, EH clearance improvements, and other nonstandard capabilities. (See AR 71-9 for information on processing operational-needs statements.)

5-45. Division echelon engineers must also understand contingency construction authorities and associated funding to meet construction requirements and activities in support of contingencies. The contract construction agent may provide military construction and nation-building support that is beyond the scope of organic troop construction capabilities. The EAB engineer staff collaborates and consults with legal and financial management personnel for the latest definitive guidance. Contracting command battalions and brigades may also award and approve minor contract construction outside of USACE.

ECHELON RELATIONSHIP TO ACTIVITIES

5-46. Divisions are optimized for the tactical control of brigades during decisive action. The principal task of the division is directing its subordinate brigades that are tailored for any combination of offensive, defensive, and stability or DSCA operations. It is typically at the division echelon where these operational elements are combined and conducted simultaneously. During major combat operations, a division may be attacking in one area, defending in another, and focusing on stability tasks in a third. Simultaneous combinations are also present in missions dominated by stability tasks. While the division echelon retains a perspective on operational engineering efforts, the primary focus is on providing tactical control of the engineer operations supporting its brigades.

5-47. The division echelon engineer considers the implications of distinct operational elements on the arrangement of forces and employment of combat power. Engineer support provided to a BCT is focused on maneuver at the tactical level. The engineer organizations organic to the BCT are optimized to perform combat engineering tasks (primarily mobility with limited capabilities in countermobility and survivability) and geospatial engineering support provided by the organic terrain teams. Additional engineer support (combat and general engineering) comes from modular engineer organizations that are task-organized to the BCTs or from EAB organizations that provide support. General engineering at this echelon primarily focuses on reinforcing the combat engineering capabilities and supporting the sustainment of BCT operations. Engineer tasks executed below the division echelon are significantly influenced by the tactical focus of the operational element they support. These distinct engineer tasks supporting offensive, defensive, and stability or DSCA operations are combined and conducted simultaneously at the division level.

5-48. The division echelon engineer’s consideration includes the arrangement of multifunctional forces and the employment of combat power. MEB operations contribute significant combat power (lethal and nonlethal in nature) to all decisive action components. Based on mission variable analysis, the MEB is task-organized with additional capabilities to meet mission requirements. The MEB conducts only very limited offensive and defensive operations as a brigade, but typically supports other organizations in performing offensive and defensive operations. Force-tailored MEB capabilities can provide critical nonlethal capabilities to conduct or support stability or DSCA operations.

OFFENSIVE OPERATIONS

5-49. In major combat operations, a division typically operates along a line of operations or in an AO. In combat operations, the offense is the decisive element of decisive action. Offensive operations are the primary means for gaining and maintaining. The offense aims at defeating, destroying, or neutralizing the enemy. A commander may conduct offensive operations to deprive the enemy of resources, seize decisive terrain,
develop intelligence, hold an enemy in position, or facilitate other friendly operations. Surprise, concentration, audacity, and tempo characterize successful offensive operations.

5-50. Surprise includes the tempo and intensity in executing the attack plan and employing unexpected factors (such as selecting a less than optimal COA), varying operational tactics and methods, conducting deception operations, and ensuring operations security. An enhanced common operational picture and enhanced terrain visualization enable engineer commanders to achieve the element of surprise because enemy defensive preparation is better understood. Engineers achieve surprise through obstacle reduction and situational obstacle use. The element of surprise is enabled by rapidly overcoming obstacles, thus increasing the force tempo.

5-51. Concentration requires careful prior coordination within the combined arms team, other Services, and multinational partners as required. Engineers consider concentration in planning by integrating geospatial products and templating threat obstacles and hazards. This effort is further enhanced with the employment of engineer reconnaissance, which can provide the necessary obstacle information and other technical information essential for detailed planning. This allows the maneuver force and the engineers that support them to concentrate reduction assets and overcome obstacles or other hazards as part of the maneuver unit breaching plan.

5-52. Engineers who understand the commander’s intent and operate in a decentralized role can enable the commander to see the operational environment and anticipate future operations. With enhanced situational understanding, commanders can be more audacious. Engineer speed and flexibility are crucial to the attack. Rapid mobility operations by engineers ensure the maneuver force tempo. The ability to quickly reduce, mark, and guide the supported maneuver unit through an obstacle is the engineer’s hallmark.

5-53. Engineer operations in support of offensive operations focus on enabling movement and maneuver. A significant consideration for the division echelon is ensuring that subordinate BCTs conducting offensive operations are provided adequate, additional combat engineering capabilities to enable the maneuver commander’s freedom of action. Required combat engineering augmentation is typically task-organized in command relationships to provide the gaining commander with maximum flexibility to employ assets.

5-54. Engineer support at the division echelon for offensive operations also considers the selected forms of offensive maneuver (envelopment, turning movement, penetration, infiltration, and frontal attack). Executing the forms of maneuver translates into the following types of offensive operations at the tactical level:

- Movement to contact.
- Attack.
- Exploitation.
- Pursuit.

**Note.** See FM 3-90.1 for more information on the forms and types of offensive maneuver. Table 5-2 provides a summary of engineer considerations for each type of offensive action.

<table>
<thead>
<tr>
<th>Type of Operation or Form of Maneuver</th>
<th>Engineer Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement to contact</td>
<td>- The priority for combat engineering support is typically mobility; although, it may rapidly shift to countermobility in anticipation of an enemy attack.</td>
</tr>
<tr>
<td></td>
<td>- The task organization of engineers must balance task-organizing mobility capabilities with the lead element to optimize response time and tempo without increasing the risk to the mobility of the main body or limiting the ability to mass breaching assets against complex obstacles.</td>
</tr>
</tbody>
</table>
Table 5-2. Engineer considerations in offensive operations (continued)

<table>
<thead>
<tr>
<th>Type of Operation or Form of Maneuver</th>
<th>Engineer Considerations</th>
</tr>
</thead>
</table>
| Attack                               | • The employment of engineer reconnaissance as part of the information collection effort helps generate obstacle information, which provides the necessary detailed picture of the enemy situation. If breaching operations are anticipated, the breach organization is established based on detailed reverse planning.  
  • The engineer priority of effort is toward mobility, with the priority of support to the main effort  
  • The countermobility effort, primarily through the employment of situational obstacles, is initially directed at supporting the isolation and fixing of enemy forces and protecting the flanks.  
  • Engineers are prepared to conduct countermobility and survivability operations in support of a defense upon the seizure of the objective and, depending on the follow-on mission, while mobility operations center on clearing obstacles or improving lanes to support friendly movement. |
| Exploitation                         | • Engineers support an exploitation by breaching obstacles to facilitate the maneuver of ground forces, keeping supply routes open, and emplacing situational obstacles to protect the flanks. |
| Pursuit                              | • The direct pressure and encircling forces require engineers to be forward in movement formations to quickly breach any obstacles that cannot be bypassed to ensure unimpeded movement. Engineers also conduct countermobility and survivability tasks in support of the encircling force. |

5-55. Although the forms of offensive maneuver and the types of offensive operations have different intentions, the planning phase must always begin with predicting adversary intent through a thorough understanding of the threat, threat engineer capabilities, and terrain effects operations. Geospatial information and services become the foundation and common reference for planning. Engineer planning tends to focus on mobility support and likely includes a robust reconnaissance effort. Since engineer units tend to have command relationships to maneuver commanders conducting offensive operations, parallel planning between division and subordinate echelons is vital in allowing engineer units to position critical assets with, establish linkup with, and task-organize into their supported units. A significantly greater degree of planning (centralized at the division echelon) is required when operations require division level control of maneuvering brigade level forces (breaching operation, gap-crossing operation).

**DEFENSIVE OPERATIONS**

5-56. Defensive operations are conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability tasks. Defense plans should not be designed to simply resist enemy attack. Defensive operations should aim at reverting to the offense and decisively defeating the enemy. Engineer focus is on attacking the ability of the enemy to influence operating areas (countermobility through combined arms obstacle integration and survivability of the defending force) and on assuring mobility for friendly repositioning or counterattacking forces.

5-57. The defending force arrives first on the battlefield and, with the help of engineers, shapes the battlefield to its advantage. Based on the higher commander’s intent, maneuver commanders, the fire support officer, and engineers site tactical obstacles to enhance the effects of direct and indirect fires on the enemy. Engineers provide technical expertise and advice to the commander on tactical obstacle emplacement. Fortifications allow fires from positions that best disrupt and destroy the attacker. Due to defending force survivability, the defender can postpone the commitment of major forces until the attack develops and then strike the extended enemy over selected, prepared terrain.

5-58. Preparation, security, disruption, massed effects, and flexibility characterize successful defensive operations (see FM 3-90.1). Defensive operations have a distinct preparation phase, which is vital to setting the conditions for combat and giving the defender the edge against an attacker. The mission of the engineer
staff officer and engineer commanders is to plan and execute engineer efforts that enhance the ability of the defending unit to combine fires, obstacles, and maneuver to destroy an attacking enemy. The success of engineers in the preparation of the defense depends largely on the ability of the division echelon engineer to conduct integrated planning with the division staff and parallel planning with supporting and subordinate engineer units. The division echelon engineer uses parallel planning to disseminate the information and intent needed to foster early planning and the preparation efforts that are required at subordinate levels. The division scheme of engineer operations, task organization, obstacle control, survivability guidance, and allocation of resources (barrier materials, munitions, and construction equipment) enable and focus subordinate unit engineer efforts. With the information provided, subordinate units can anticipate the limitations of allocated capabilities and prioritize efforts and resources to mitigate limitations.

5-59. A significant consideration for the division echelon is ensuring that subordinate BCTs conducting defense operations are provided adequate additional combat and general engineering capabilities to meet the requirements. The division echelon must balance the availability of combat and general engineering capabilities against extensive requirements in support of the protection and movement and maneuver warfighting functions. Typically, these assets are task-organized in support relationships to optimize their availability. An exception is that some general engineering units may be task-organized in a command relationship to a combat engineering unit or an engineer headquarters unit to facilitate integration into the combined arms team.

5-60. The types of defensive operations are mobile defense, area defense, and retrograde operations. These types have significantly different concepts and must be dealt with differently during planning and execution as follows:

- **Mobile defense.** Engineer support to a mobile defense focuses on using obstacles to attack enemy maneuvers and providing mobility to the striking and reserve force. Many countermobility and survivability assets support the fixing force while many mobility assets support the striking force. Obstacle control coordinated at the division echelon is directed at the most likely enemy COA rather than the terrain and may be restricted to assure striking force mobility. Situational obstacles are advantageous in the mobile defense. These obstacles allow the commander to exploit enemy vulnerabilities, exploit success, separate follow-on forces, and provide flank protection.

- **Area defense.** In an area defense, the focus of engineer effort is on providing the maneuver commander with the ability to hold terrain while enabling maneuver units to concentrate fires from static positions. Engineers help identify key and decisive terrain that supports the commander’s concept of operations, with a focus on where the commander wants to kill the enemy. During obstacle planning, obstacle control measures are designed to give maximum flexibility to subordinate units while focusing the tactical obstacle effort on terrain retention. The engineer staff officer must advise the commander of the resource requirements of each subordinate unit based on its assigned essential mobility, countermobility, survivability, and other engineering tasks. The division echelon must balance these engineer resource requirements.

- **Retrograde operations.** Mobility and countermobility are normally the focus of engineer support to a retrograde. The actual priority of effort depends on whether the unit is in contact with the enemy. The underlying purpose of engineer support to the retrograde is twofold as follows:

  - The mobility of the force must be maintained, regardless of the type of retrograde being conducted. Mobility focuses on maintaining the ability of the force in contact to disengage while preserving the main body freedom of maneuver.

  - The force must be protected because they are particularly vulnerable to enemy actions during retrograde operations. Consequently, a retrograde is normally conducted under limited visibility conditions. Engineers support units left in contact and extend the time available to the commander by reducing enemy mobility through obstacles, fires, and terrain optimization.

**Stability Operations**

5-61. Stability operations are part of decisive action. Stability operations are intended to promote and protect U.S. interests by influencing the military, political, and information variables of the operational environment through a combination of peacetime developmental and cooperative activities and coercive actions in response to a crisis. The focus for most stability operations is to sustain the outcome achieved from combat
operations, to prevent the threat from returning, and to prevent conditions that enable a threat to return and realize the strategic results. Army forces perform the following primary stability tasks:

- **Civil security.** Civil security aims at protecting the population from external and internal threats.
- **Civil control.** Civil control aims at regulating the behavior and activity of individuals and groups. Civil control limits population activities to allow for the security and essential services. A curfew is an example of civil control.
- **Infrastructure reconnaissance.** Infrastructure reconnaissance is focused on gathering technical information on the status of the large-scale public systems, services, and facilities of a country or region that are necessary for economic activity (see FM 3-34.170).
- **Restoration of essential services.** Restoring essential services includes the restoration of emergency lifesaving medical care, veterinary service, epidemic disease prevention, provisions of food and water, provisions for emergency shelter from the elements, and provisions for basic sanitation (waste disposal). The restoration of essential service is an area that typically receives significant engineer focus.
- **Support to governance.** Support to governance includes provisions for control functions (including public activity regulation, rule of law, taxation, security maintenance, control, and essential services) and the normalization of the succession of power.
- **Support to economic and infrastructure development.** Provide direct and indirect military assistance to local, regional, and national entities to provide an indigenous capacity and capability for continued economic and infrastructure development.

5-62. Stability operations tend to be a longer duration than most operations. While combat engineering route clearance and other close support capabilities may be critical tasks that are applied through the movement and maneuver warfighting function, a larger portion of the engineer requirements within the BCT and MEB AOs are likely met with significant general engineering and other specialized engineering capabilities. MEBs that control an AO in stability operations will most likely have the same mission as BCTs but within more permissive conditions. In these cases, MEBs will become focused on their own AOs and create the need to consider a functional engineer brigade to provide synchronization for engineer tasks across the division. The general engineering effort may be at a relatively high level at the onset or during transition from combat operations. This level gradually decreases as the operation matures, but stability operations typically require a much higher level of technical engineer expertise than combat operations. The division echelon must coordinate for the simultaneous execution of these engineer efforts throughout the depth of the AO and among the subordinate brigades. When the required engineer augmentation is unavailable, engineers must rely on contracted engineer support, reachback, or collaborative planning with other engineer elements for the necessary technical support to provide the required engineer capabilities. As the operation matures, the general engineering effort may transfer to civilian contractors (such as those who operate under the Logistics Civil Augmentation Program). Engineer missions tend to focus on long-term force sustainment. Likely missions include—

- Base camp construction and force bed-down facilities.
- Survivability and other protection support.
- Robust support area facilities.
- Infrastructure support.
- Reliable power generation and distribution facilities.
- Construction, maintenance, and repair of lines of communication.

5-63. Stability operations involve coercive and constructive military actions. Stability operations are designed to establish a safe and secure environment and facilitate reconciliation among local or regional adversaries. A significant engineer effort is focused on infrastructure repair and restoration to reestablish services that support the population. Given the nature of stability tasks, the risks associated with environmental hazards may have a greater importance and impact in stability operations than in offensive or defensive operations. Mission variable analysis focuses on the different aspects of the terrain and friendly and threat capabilities. In stability operations, terrain products are important, but political and cultural considerations become more important than they were in strictly combat terrain. Terrain analysts work with the intelligence staff to develop usable products for the commander to reflect information. When analyzing the troops available, the engineer staff officer has an increased interest in HN, third party nongovernmental
organizations, contract organizations, or other multinational forces involved with engineering capabilities. Increased interaction with these other parties requires that engineers address interoperability, common standards, and mutual agreements. Engineer planners must also consider that the employed military engineer unit will operate among civilians or in conjunction with nongovernmental and other international organizations.

5-64. The engineer staff officer and supporting engineer unit commander likely have a requirement to integrate the activities of general and more specialized engineering capabilities (assessments, engineering services, and emergency repairs) within the AO. Typically, these assets are task-organized in support relationships to optimize their availability. In a major reconstruction effort, additional engineer brigades could be task-organized to the division. These units are equipped and manned to fulfill the design, construction management, and mission command requirements needed to accomplish these missions, which likely include—

- Base camp construction and power generation.
- Emergency restoration of critical public services and facilities.
- Infrastructure reconnaissance, technical assistance, and damage assessment.
- Emergency demolition.
- Debris or route-clearing operations.
- Combat (temporary) road and trail construction.
- Forward aviation combat engineering (including repairing paved, asphalt, and concrete runways and airfields).
- Installation of assets that prevent foreign object damage to fixed- and rotary-wing aircraft.
- Construction of temporary bridging.
- Area damage control missions that support the DSCA force mobility.
- Facility, port, and airfield construction and upgrade.
- Construction of sustainment facilities for waste management and supply issuance.

5-65. There are broad categories of stability operations. These categories are neither discrete nor mutually exclusive. For example, a force engaged in a peace operation may also conduct arms control or a show of force to set the conditions for achieving an end state. Engineer operations remain synchronized throughout the various types of stability operations through the warfighting functions. (See ADRP 3-07 and ADRP 5-0.)

5-66. The clearance of mines by engineers during stability operations is based on the necessity to support military operations. (See 10 USC 407 for more information on military demining.) Humanitarian mine action organizations provide prevalent mine clearance support in support of local populations. Such action is ultimately a HN responsibility. U.S. Army participation in humanitarian mine action focuses on training HN personnel (including demining training, the establishment of national mine action centers, and mine risk education). U.S. military personnel may assist and train others in demining techniques and procedures but are prohibited by federal statute from detecting, lifting, or destroying land mines unless done for the concurrent purpose of supporting a U.S. military operation. Humanitarian mine action training missions are normally conducted by special operations forces and assisted by explosive ordnance disposal. Civil affairs personnel help establish national mine action centers, and psychological operations personnel provide mine risk education.

5-67. The Humanitarian and Civic Assistance Program provides support to the local population through military operations and exercises performed predominantly by U.S. forces. Army forces (including engineer headquarters) may be tasked to provide the mission command support necessary to plan and execute the ground portion of humanitarian assistance operations. This assistance also fulfills unit training requirements. The assistance that engineers may provide under the Humanitarian and Civic Assistance Program is limited to the—

- Construction of rudimentary surface transportation systems.
- Well drilling and construction of basic sanitation facility construction.
Rudimentary construction and repair of public facilities and utilities. (Assistance may also include feeding centers and waste disposal facilities.)

Land mine detection and clearance (including activities related to education, training, and technical assistance with land mine detection and clearance).

**DEFENSE SUPPORT OF CIVIL AUTHORITIES**

5-68. The overall purpose of DSCA operations is to meet the immediate needs of U.S. citizens in times of emergency until civil authorities can meet the needs without assistance. DSCA operations are similar to stability operations but differ because DSCA operations are conducted within the United States and U.S. territories. DSCA operations are executed under U.S. law. For example, National Guard forces that are under state control have law enforcement authority when operating within the United States, but law enforcement authority is not granted to Regular Army units. DSCA operations conducted in the United States are conducted in support of other governmental agencies to assist state and local authorities. These agencies are trained, resourced, and equipped far more extensively than counterpart agencies that are involved in stability operations overseas. (See ADRP 3-28 for more information on DSCA operations.)

5-69. The Army supports civil authority during DSCA operations in a unity of effort. Most disasters are handled at the state level and below. Commanders may respond to a request for assistance from a civil authority if serious conditions exist and time does not allow for approval from a higher authority. DOD officials provide an immediate response by temporarily employing the resources under their control (subject to supplemental direction provided by higher headquarters) to save lives, prevent human suffering, or mitigate great property damage within the United States. Federal resources are committed when requested by the state in need. A civilian federal agency may be placed in charge of disaster response operations if the state government is overwhelmed or the incident that triggered the disaster is an incident of national significance. An immediate response ends when the necessity giving rise to the response is no longer present or when the initiating DOD official or a higher authority directs an end to the response.

5-70. The division headquarters is likely be configured as a JTF, and it interacts directly with the designated lead agencies. Army commanders assume a support role to one or more designated agencies. Disaster response is normally conducted in the following phases:

- Planning.
- Response.
- Recovery.
- Restoration.

5-71. The military role is most intense in the planning and response phases and decreases steadily as the operation moves into the recovery and restoration phases.

5-72. General engineering support for the restoration of essential services is the primary focus of DSCA operations; however, the engineer disciplines may be applied simultaneously to some degree. The generating force elements of the engineer regiment (such as USACE) play a critical and significant role in DSCA operations. USACE authority to respond to civil emergencies is provided in public law. USACE is authorized to undertake activities that create a comprehensive flood response infrastructure. Flood response infrastructure is divided into the following categories:

- Disaster preparation.
- Emergency response.
- Rehabilitation.
- Water assistance.
- Advanced measures.
- Hazard mitigation.

5-73. The appropriation provides funding for most USACE preparedness activities in support of the National Response Framework. The Robert T. Stafford Disaster Relief and Emergency Assistance Act enables the Federal Emergency Management Agency to direct that federal agencies use available personnel, supplies, facilities, and other resources to provide assistance in the event of a major disaster or emergency declaration within the National Response Framework. Under the National Response Framework, the DOD has
responsibility for Emergency Support Function 3 (Public Works and Engineering). DOD has designated USACE as its operating agent for Emergency Support Function 3. USACE supports lead federal agencies for other emergency support functions upon request from the lead agency and direction from the Federal Emergency Management Agency.

5-74. Engineers can expect to be involved in planning for the support of relief actions with geospatial products and the analysis of potential areas to establish life support areas. Engineers may be called on to provide manpower support or general engineering support from units with unique capabilities (such as temporary shelter construction, power generation, firefighting, and support to nonengineer units). The engineer staff officer may leverage coordination with USACE elements involved in DSCA operations to add depth to operational environment understanding and to access reachback support.

5-75. Division echelon engineer planners consider statutes and regulations that restrict Army interaction with other governmental agencies and civilians during DSCA operations. The local and state responses normally lead the effort, with a federal response providing support as required.

5-76. The division disengages before complete restoration (the return of normality to the area). As civil authorities assume full control of normal and emergency services, the division transfers those responsibilities to replacement agencies and begins redeployment from the area. During restoration, the engineer staff officer assists the division commander in considering items (disengagement criteria and redeployment plans while recovery continues in the affected area).

OPERATIONAL CONFIGURATIONS

5-77. The primary mission of the division headquarters is to serve as a tactical warfighting headquarters directing subordinate brigades. The secondary mission is to serve as a JTF or JFLCC headquarters for small contingencies. The division does not need additional Army augmentation but does require joint augmentation to act as a JTF or JFLCC headquarters. Performing the functions of an Army forces command is a tertiary mission for a division headquarters but will not typically be required when configured as a JTF and requires significant additional Army augmentation when configured as JFLCC.

5-78. The division headquarters is a self-contained organization consisting of the division command group, a main command post, a tactical command post, a mobile command group, and a supporting division special troops battalion with the signal and sustainment necessary for the division headquarters to function. The division is not a fixed formation. It is a completely modular entity designed to exercise mission command of up to five brigades.

5-79. In every operational configuration, the division (like the corps) has an ASCC. The theater Army headquarters has regional expertise and is tailored for AO needs. This provides the division with a degree of higher-echelon support in its operational configurations, regardless of whether the division is functioning as the Army force headquarters. While some support or other administrative control responsibilities are placed on the division headquarters, it functions with a more singular focus on the assigned contingency or major operation.

TACTICAL WARFIGHTING HEADQUARTERS

5-80. As a tactical warfighting headquarters, the division—
- Employs land forces as part of a unified action force.
- Executes offensive, defensive, and stability operations in an assigned AO.
- Executes decisive, shaping, and sustaining activities.
- Assigns missions with the required resources to subordinate brigades.
- Integrates and synchronizes brigade missions to achieve operationally significant results in the AO.
- Adjusts operations to account for changing mission variables.

5-81. The division is most likely configured as a tactical warfighting headquarters in major combat operations. In this configuration, the division may be task-organized in a command relationship to a corps configured as intermediate tactical headquarters or configured as the JFLCC. In major combat operations, a
Division typically operates along a line of operations or in an AO. A division can control up to five BCTs with the appropriate supporting brigades during major combat operations.

5-82. The division may continue to act as a tactical warfighting headquarters when transitioning from major combat operations or may operate in that configuration for other large-scale operations. During protracted operations that are primarily focused on stability, the number of BCTs and supporting brigades controlled by a division headquarters is adjusted to meet mission variables and may exceed the numbers listed for major combat operations. The division may not be supported by all types of support brigades during later, protracted types of operations since their capabilities may not be required.

5-83. The engineer perspective in a tactical warfighting configuration focuses on BCT needs without losing sight of operational requirements. The BCTs conducting decisive action generate requirements for combat and general engineering capabilities to support the movement and maneuver and protection warfighting functions. General engineering capabilities are required in support of division sustainment, while geospatial and engineering reconnaissance capabilities may be required for mission command and intelligence requirements. The division should be force-tailored with at least one MEB, which can provide multifunctional mission command for a portion of the engineer effort. An engineer brigade may or may not be task-organized in support of the division depending on mission variables (including the scope of technical engineer requirements and the size of the required engineer effort). Similarly, engineer battalion headquarters units may be available for division level support or as augmentation to brigades depending on mission variables. The division engineer ensures that the division engineer staff conducts operations that are integrated within the division command post structure and collaborates in engineer missions and tasks with supporting engineer headquarters and subordinate unit engineer staff.

JOINT TASK FORCE OR JOINT FORCE LAND COMPONENT COMMAND

5-84. The division may be configured as a JTF or JFLCC for smaller-scale operations. A JTF configuration is most likely for incident management or foreign humanitarian assistance. In either configuration, the division requires augmentation. A division headquarters designated as a JTF headquarters should not also be designated as a JFLCC headquarters without significant augmentation. The division staff must transition to a joint staff structure when designated; however, only appropriate joint working groups, boards, and cells should be established. Joint and multinational representation should be provided in areas where Army personnel do not have the appropriate expertise. This allows joint and multinational components with an opportunity to participate in staff processes.

5-85. The joint force commander establishing authority is responsible for providing joint personnel and other resources to the division when the division headquarters is designated as the joint force command headquarters; however, the division commander (as the joint force commander) must determine what additional augmentation is needed and coordinate support through the establishing authority. The division commander has the option of retaining the functional organization of his headquarters or converting it into a standard joint staff configuration. A situational analysis (in terms of mission variables) determines which option the commander will choose. The joint force commander tailors the staff augmentation based on situational analysis (in terms of mission variables). Joint and special staff sections usually require augmentation for communications support to ensure joint communications connectivity.

5-86. The engineer perspective in a joint force command configuration typically focuses more on general engineering requirements for the restoration of essential services and infrastructure development without losing sight of the support required for the movement and maneuver, sustainment, and protection warfighting functions. A tailored mix of subordinate Army brigades and joint and multinational elements make up the division force. Similarly, a mix of Army modular engineer elements and unified action partners, contractors, and other engineer capabilities may be available for employment. General engineering capabilities may be retained under the control of the division echelon to facilitate the joint force commander’s priority applications. The division should be force-tailored with the appropriate mix of functional and multifunctional headquarters to provide mission command for the engineer effort. An engineer brigade may be tailored in support of the division depending on mission variables. The division engineer ensures that the joint force commander’s engineer staff conducts operations integrated within the joint force commander’s structure, and collaborates in engineer operations with supporting engineer headquarters and subordinate unit engineer staff.
Chapter 5

ARMY FORCES COMMAND

5-87. The division headquarters commands the Army forces assigned or attached to the JTF, except those assigned to or attached to the JFLCC, U.S. Marine Corps, or multinational formations. As an Army force headquarters, the division headquarters coordinates administrative control support for Army forces within its JOA and provides Army support to other Services, governmental agencies, and unified action partners as required by the joint force commander. An Army forces commander may not have OPCON of all Army forces provided to the joint force commander, but the Army forces commander remains responsible for the administrative control. When a significant level of engineer effort is required by the division, the appropriate additional engineer units may be tailored with the division or other engineer capabilities.

5-88. The size, scope, and nature of the operation for which a division headquarters is appropriate for designation as the JTF headquarters is one in which the division headquarters cannot also be the Army forces headquarters without significant Army augmentation. Therefore, the division headquarters, serving as the JTF headquarters, normally does not have administrative control responsibilities for subordinate Army units located within the JTF JOA.
Appendix A

Tailored Engineer Force Packages

This appendix provides information on engineer force packages at each higher echelon. Since there is not a set force structure for these echelons or for the range of military operations in which they will be involved, the packages shown should not be considered authoritative. The illustrations shown in this appendix provide planners with a framework for considering the types and organization of units that may be tailored to meet the combatant commander’s actual needs.

THEATER ARMY ENGINEER

A-1. The tailored engineer force supporting the theater Army echelon typically addresses specific operational and broader support requirements. The TEC is the engineer headquarters designed for the operational command of engineer capabilities at echelons above the corps level and often will provide mission command for an operationally configured theater Army headquarters. When the full TEC is tailored for the operation, it is capable of addressing the broader support required by the administrative control of the ASCC, Army support to other Services, and common-user logistics responsibilities.

A-2. The theater Army headquarters will have an assigned USACE LNO who coordinates access to USACE capabilities (including technical engineering assistance and contract construction through reachback and deployable teams). This LNO may assist in coordinating with the DOD-designated contract construction agent for the AO or selected JOA. Additional FFE support may be tailored through FFE elements supporting the theater Army headquarters, the TEC, or both. USACE normally retains mission command of its divisions, districts, and offices in the theater. USACE is an Army direct reporting unit and has unique congressional, DOD, and Army authorities and warrants concerning contract construction and technical engineering services. USACE establishes support relationships with theater Army commands that resemble general support or direct support relationships to provide the required engineer support.

A-3. The specific capabilities required at each subordinate echelon will vary widely based on mission variables. As baseline and specialized elements are tailored to meet identified and anticipated requirements, adequate consideration must also be given to the control of these capabilities. The engineer brigade headquarters controls functionally focused engineer operations and includes a span of control adequate to support corps or division echelons. The MEB controls multifunctional maneuver support and support area operations and includes a span of control that typically supports a division echelon but may also support a corps echelon.

MAJOR COMBAT OPERATIONS

A-4. When the combatant commander acts as the joint force commander during major combat operations, the theater Army may provide the land component commander and headquarters. Consequently, it exercises OPCON over land forces deployed to a JOA. Figure A-1, page A-2, shows a theater Army echelon engineer force organized under TEC control.

A-5. In figure A-1, the full TEC is tailored for the operation and is capable of addressing the specific operational requirements and broader support required by the administrative control of the ASCC, Army support to other Services, and common-user logistics responsibilities. An engineer facility detachment or forward engineer support team is tailored to support the TEC. The forward engineer support team may further serve as a base for a provisional USACE district or division if required during the operation. During large theater operations, USACE may need to provide one or more contingency engineer districts (in general support or direct support) to support the contract construction agent requirements and provide a USACE
command cell in the TEC from the USACE division supporting the regional ASCC. Specific capabilities tailored for the subordinate corps and division echelons are not included in figure A-1.

**Legend:**
- **const**: construction
- **EHCC**: explosive-hazard coordination cell
- **FEST**: forward engineer support team
- **JFLCC**: joint force land component command
- **MEB**: maneuver enhancement brigade

**Figure A-1. Notional theater engineer force package**

**CONTINGENCY OPERATIONS**

A-6. When required, the theater Army with other Service augmentation can provide a headquarters that is able to provide mission command for a JTF for contingencies. A significant consideration for this operational configuration is the designation of the JTF engineer to coordinate and integrate engineer disciplines in the joint operational area. The JTF engineer is also responsible for the engineer common operational picture. The theater Army echelon engineer may remain with the theater Army main command post while a designated alternate supports the deployed JTF command post as the engineer representative. Figure A-2 shows a theater Army echelon JTF engineer force that is organized under the control of the TEC deployable command post or an engineer brigade headquarters.

**Figure A-2. Notional theater JTF engineer force package**
Figure A-2. Notional theater JTF engineer force package (continued)

A-7. In figure A-2, the deployable command post from the TEC or an engineer brigade headquarters is tailored for the operation and capable of addressing the specific operational requirements. An engineer facility detachment or forward engineer support team is tailored to support the TEC or engineer brigade headquarters. A forward engineer support team may be required to support the JTF engineer staff. During JTF-sized operations, USACE may provide a contingency engineer district to support the contract construction agent requirements (in general support or direct support). A USACE command cell may be required to plug into the deployable command post/engineer brigade from the USACE division that is supporting the regional ASCC. Specific capabilities tailored for the subordinate division and brigade echelons are not included in figure A-2.

SUPPORT TO ARMY AND UNIFIED ACTION PARTNERS

A-8. The theater Army headquarters continues to perform AO-wide functions and its operational responsibilities. These functions include—

- Reception, staging, onward movement, and integration.
- Logistics over-the-shore operations.
- Security coordination.

A-9. Figure A-3 shows cases in which the theater Army headquarters performs operational and support functions or supports a separate joint force commander.

Figure A-3. Notional ASCC engineer force package
Appendix A

Legend:
- ADCON: administrative control
- ASOS: Army support to other Services
- const: construction
- CUL: common-user logistics
- DCP: deployable command post
- EHCC: explosive-hazard coordination cell
- FEST: forward engineer support team
- JFC: joint force command
- JFLC: joint force land component
- JTF: joint task force

Figure A-3. Notional ASCC engineer force package (continued)

A-10. If the theater Army headquarters functions as an operational headquarters while continuing to perform its AO-wide functions, the tailored engineer force typically addresses both sets of requirements. The TEC and engineer brigade are capable of controlling operational and other support requirements, but the engineer brigade headquarters is better suited for a limited span of control. When the theater Army headquarters is not operationally engaged and is only providing administrative control, Army support to other Services, and common-user logistics functions for a separate joint force command, an engineer force package with an adequate controlling headquarters may still be needed.

CORPS ENGINEER

A-11. The tailored engineer force supporting the corps echelon typically focuses specifically on operational requirements. The engineer brigade or the TEC deployable command post is capable of providing effective mission command of engineer operations for contingencies in which the corps headquarters is required. Additional engineer brigades or MEBs may be required in support of the corps and its subordinate divisions.

A-12. The corps headquarters will have an assigned USACE LNO (including technical engineering assistance and contract construction through reachback and deployable teams). This LNO provides access through reachback to additional technical support. The LNO may also assist in coordination with the DOD-designated contract construction agent for the selected JOA. Additional FFE support may be tailored through forward engineer support teams or engineer facility detachments that support the corps headquarters, engineer brigade, or both.

A-13. The specific capabilities required at subordinate echelons will vary widely according to mission variables. As baseline and specialized elements are tailored to meet identified and anticipated requirements, adequate consideration must also be given to the control of these capabilities. The engineer brigade headquarters controls functionally focused engineer operations and includes a span of control adequate to support corps or division echelons. The MEB controls multifunctional maneuver support operations (including a span of control adequate to support corps or division echelons).

MAJOR COMBAT OPERATIONS

A-14. When required, a corps may become an intermediate tactical headquarters under the land component command and have OPCON of multiple divisions (including multinational or Marine Corps formations) or other large tactical formations. Figure A-4 shows a corps echelon engineer force organized under the control of the engineer brigade headquarters.

A-15. In figure A-4, the full brigade headquarters is tailored for the operation and is capable of addressing the identified and anticipated operational requirements. An engineer facility detachment or forward engineer support team is tailored to support the brigade, and a forward engineer support team may be required to support the corps echelon engineer staff. Specific capabilities tailored for the subordinate division and brigade echelons are not included in figure A-4.
CONTINGENCY OR PROTRACTED OPERATIONS

A-16. The corps can rapidly transition to a JTF or JFLCC headquarters for contingency or protracted operations. The designation of the JTF engineer is of note in this operation configuration. The corps engineer transitions to become the JTF engineer and will not have additional responsibilities associated with Army forces. Figure A-5 shows a corps echelon JTF engineer force organized under the TEC deployable command post or an engineer brigade headquarters control.
DIVISION ENGINEER FORCE PACKAGES

A-18. Typically, at least one MEB will be required in operations or contingencies that require the deployment of the division headquarters in one of its configurations. In some cases, the division may need an additional functional engineer brigade based on mission requirements. The tailored engineer force supporting the division echelon will typically focus primarily on support for the tactical requirements of subordinate brigades. Table A-1 provides considerations at the division echelon for scenarios in which an engineer brigade and MEB may be required.

<table>
<thead>
<tr>
<th>MEB</th>
<th>Engineer Brigade</th>
</tr>
</thead>
<tbody>
<tr>
<td>A division involved in major combat operations should be supported by all types of support brigades (including the MEB). In combat operations, the MEB is specifically designed to control the division support area to provide for the collective protection of the units in the support area and to enable movement within the support area through movement corridor establishment.</td>
<td>A division acting as the primary tactical echelon headquarters in major combat operations will require an engineer brigade headquarters when the engineer requirements exceed the limited capabilities of the MEB. This will most likely be the case if the MEB is assigned an AO to control.</td>
</tr>
<tr>
<td>A MEB, when given adequate resources, can conduct stability tasks in an AO while simultaneously supporting the offensive or defensive operations being conducted by its higher headquarters.</td>
<td>A division will significantly benefit from the functional span of control of the engineer brigade in most stability or DSCA operations. During stability, the division may need an engineer brigade to integrate and synchronize engineer capabilities if the MEB is assigned its own AO for conducting stability operations.</td>
</tr>
<tr>
<td>The MEB has limited ability to integrate and synchronize engineer capability across the force when given an AO to control (the support area or an AO during stability).</td>
<td>One or more engineer brigades may be required, based on mission variables, when the division is configured as a joint force command for smaller-contingency operations.</td>
</tr>
</tbody>
</table>

Legend:
- AO: area of operations
- DSCA: defense support of civil authorities
- MEB: maneuver enhancement brigade

A-19. In some cases, the division headquarters may receive an LNO that coordinates technical engineering assistance and contract construction through reachback and deployable teams. The LNO may also assist in coordination with the DOD-designated contract construction agent for the selected JOA. Additional FFE
Tailored Engineer Force Packages

support may be tailored through forward engineer support teams or engineer facility detachments supporting the division headquarters, engineer brigade, or both.

A-20. Specific capabilities required at subordinate echelons will vary widely based on mission variables. As baseline and specialized elements are tailored to meet identified and anticipated requirements, adequate consideration must also be given to the control of these capabilities. When two or more engineer modules are task-organized in support of a BCT, MEB, engineer brigade, or other unit, an engineer battalion headquarters may be required for mission command and sustainment of those modules.

MAJOR COMBAT OPERATIONS

A-21. Divisions are the primary tactical warfighting headquarters for the Army. Their principal task is directing subordinate brigade operations. Figure A-6 shows engineer capacity under the MEB and each BCT. Additional engineer capacity at the division echelon engineer force may be organized under the control of the engineer brigade headquarters. The engineer forces shown are in addition to the packages shown at higher echelons in previous figures.

![Diagram](image)

**Legend:**
- BCT: brigade combat team
- cbt: combat
- const: construction
- FEST: forward engineer support team
- MAC: mobility assault company

**Figure A-6. Notional division engineer force package**

A-22. In figure A-6, a MEB supports the division while each BCT (with its brigade engineer battalion) is augmented with EAB engineer capability. An engineer brigade headquarters is tailored to address identified and anticipated division level requirements beyond the capabilities of the BCTs and the MEB. An engineer facility detachment or forward engineer support team is tailored to support the engineer brigade, and a forward engineer support team may be required to support the division echelon engineer staff. Specific capabilities tailored for the subordinate BCTs are included in figure A-6 but will vary based on mission variables.
**SMALLER-SCALE CONTINGENCY OPERATIONS**

A-23. With appropriate joint augmentation, a division can be the JTF or JFLCC headquarters for small contingencies. Figure A-7 shows a division echelon JTF engineer force organized under the control of an engineer brigade headquarters.

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**Legend:**
- BCT: brigade combat team
- BEB: brigade engineer battalion
- const: construction
- FEST: forward engineer support team
- HQ: headquarters
- JFC: joint force command
- OPCON: operational control

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**Figure A-7. Notional division joint force command engineer force package**

A-24. In figure A-7, an engineer brigade headquarters is tailored for the operation and is capable of controlling joint and multinational engineer forces, or these forces may operate directly under JTF control. Additional engineer capability is shown under the MEB and each BCT. An engineer facility detachment or forward engineer support team is tailored to support the engineer brigade headquarters, and a forward engineer support team may be required to support the JTF engineer staff. Specific capabilities tailored for the subordinate BCTs are included in figure A-7, but they will vary based on mission variables.
Appendix B

Working Groups, Boards, and Cells

This appendix describes engineer staff and geospatial engineering organizations at each echelon from division to theater Army. It also highlights many of the key working groups, boards, and cells with which the engineer staff may interact.

WORKING GROUPS

B-1. Ad hoc groups form to solve problems and coordinate actions. These groups include representatives from within or outside a command post. The composition of these groups depends on the issue on which they are working. Each group is a control mechanism for regulating a specific action, process, or function.

B-2. A working group is a temporary grouping of predetermined staff representatives who meet to coordinate and provide recommendations for a particular purpose or function. Some working groups may be thought of as ad hoc cells. Others are the forum used to synchronize contributions of multiple cells to a process. For example, the targeting working group brings together representatives of all staff elements concerned with targeting. It synchronizes the contributions of all staff elements to the work of the fires cell. It also synchronizes fires with current or future operations. Working group meetings may be held at a central location, by teleconference, by video teleconference, or by a combination of all of these. Working groups are formed as needed or when directed by the commander. Typical working groups and the lead cell or staff section at the division and corps headquarters is shown in Table B-1.

Table B-1. Typical working groups

<table>
<thead>
<tr>
<th>Working Groups</th>
<th>Lead Cell or Staff Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations synchronization</td>
<td>Current operations cell</td>
</tr>
<tr>
<td>Plans</td>
<td>Plans cell</td>
</tr>
<tr>
<td>Targeting</td>
<td>Fires cell</td>
</tr>
<tr>
<td>Information operations</td>
<td>G-3 section</td>
</tr>
<tr>
<td>Information collection</td>
<td>Current operations cell</td>
</tr>
<tr>
<td>Geospatial intelligence</td>
<td>Geospatial intelligence cell</td>
</tr>
<tr>
<td>Intelligence synchronization</td>
<td>Intelligence cell</td>
</tr>
<tr>
<td>Protection</td>
<td>Protection cell</td>
</tr>
<tr>
<td>Logistics synchronization</td>
<td>Sustainment cell</td>
</tr>
<tr>
<td>Movements</td>
<td>Sustainment cell</td>
</tr>
<tr>
<td>Civil-military operations</td>
<td>G-9 section</td>
</tr>
<tr>
<td>Information management</td>
<td>G-6 section</td>
</tr>
</tbody>
</table>

Legend:
G-3     assistant chief of staff, operations
G-6     assistant chief of staff, information management
G-9     assistant chief of staff, civil affairs operations

B-3. The subject and number of working groups depends on the situation and echelon. For example, a corps may form working groups to address enemy improvised explosive device tactics or refugee return and resettlement. Battalion and brigade headquarters normally have fewer working groups than higher echelons, and working groups at battalion and brigade headquarters are often less formal. Groups may gather daily, weekly, or monthly depending on the subject, situation, and echelon.
Working groups are a major part of the headquarters battle rhythm. The chief of staff or executive officer oversees the battle rhythm and scheduling of working group meetings. Each group should be logically sequenced so that the outputs of one group are available as the inputs for another. Chiefs of staff or executive officers balance the time required to plan, prepare for, and hold working group with other staff duties and responsibilities. They also examine attendance requirements critically. Some staff sections and cells may not have enough personnel to attend all working groups. Chiefs of staff and cell leaders constantly look for ways to combine working groups and eliminate unproductive ones.

**BOARDS AND CELLS**

A board is a temporary grouping of selected staff representatives delegated with decision authority for a particular purpose or function. They are similar to working groups. When the process or activity being synchronized requires command approval, a board is the appropriate forum. The unit standard operating procedure establishes the purpose, frequency, required inputs, expected outputs, attendees, and agenda of each board.

A joint force commander may establish engineer boards or cells to manage engineer-intensive activities and to ensure the effective use of resources to meet mission requirements. Engineer boards establish policies, procedures, priorities, and oversight to coordinate the efficient use of engineer resources. Engineer boards serve as the forum to address issues outside of daily operations and to ensure coordination at the leadership level and across staff directorates. The joint force engineer and staff carry out responsibilities of engineer-specific boards until the boards are formed.

An important distinction between a board and a working group is that a board is usually a decisionmaking body. Working groups conduct staff coordination at the action officer level and prepare materials for decisions to be made at a board. Cells within the JTF are a group of personnel with specific skills who are listed together on the headquarters joint manning document to accomplish key functions. It is important for the Services and components to be represented on the engineer boards to facilitate vertical and horizontal integration that will allow the joint force engineer to capitalize on the advantages of joint capabilities. Collaborative tools allow components to participate in boards without having to be physically present at the joint force headquarters. The joint force engineer is responsible for the boards described below.

The combatant commander or subordinate joint force commander may establish a JCMEB to assist in managing civil-military construction and engineer projects and resources. The JCMEB is a temporary board that is chaired by the combatant commander or the designated representative (the combatant command J-4, combatant command engineer, subordinate joint force engineer, civil affairs officer). The joint force engineer will provide the secretary and manage the administrative details of the board. Key members on the board include the J-3 future plans officer; J-4; engineer; civil affairs officer; judge advocate; and force structure, resource, and assessment directorate of a joint staff (J-8) officer. Other personnel from the staff, Service components, DOD agencies, or activities in support of the combatant command may also participate.

According to combatant commander guidelines, the JCMEB establishes policies, procedures, priorities, and overall direction for general military construction and engineer requirements in the theater. Figure B-1 depicts some typical inputs and outputs for the board, primary membership, and outside stakeholders. The board gauges mission impact from engineering activities and recommends actions as needed. A primary task of the board is to deconflict requirements between the military and civilian aspects of construction during a joint operation. The board should also facilitate synchronization of the joint force engineer effort with similar efforts being undertaken at the strategic level. The JCMEB will coordinate its activities with the engineering and civil affairs staff of the combatant command. The JCMEB elevates construction and engineer requirements that it cannot satisfy with joint force resources to the next appropriate level. The JCMEB may arbitrate issues referred to it by the joint facilities utilization board. The JCMEB, in conjunction with the joint facilities utilization board, also provides guidance on ESP development to an operation plan or operation order and, if appropriate, assumes responsibility for the preparation of the ESP.

The joint force commander may establish a joint facilities utilization board to assist in managing the Service component use of real estate and existing facilities. The joint facilities utilization board is a temporary board chaired by the combatant command or subordinate joint force engineer with members from the joint force staff, Service components, and other required special activities (legal, contracting, civil affairs). If the joint force commander decides that all engineer-related decisions are made at the JCMEB, the joint facilities
utilization board functions as a working group to forward recommendations for decision to the JCMEB. The joint facilities utilization board evaluates and reconciles component requests for real estate, the use of existing facilities, inter-Service support, and construction to ensure compliance with priorities established by the joint force commander. It serves as the primary coordination body within the JTF for approving construction projects to meet the required timeline to support troop bed-down and mission requirements. For long-standing JTFs, the joint facilities utilization board may issue master planning guidance and develop the JTF military construction program to support enduring base operations. The joint force engineer, with assistance from selected board members, handles most of the joint facilities utilization board work. Unresolved issues may be forwarded to the JCMEB.

Figure B-1. JCMEB inputs and outputs

B-10. Contingency engineering management organizations are an option for augmenting the joint force staff, providing additional service engineering expertise to support contingency and crisis action planning, and providing construction management in contingency and major combat operations. The conduct of theater Army echelon construction operations may be managed by a theater or a regional contingency engineering management cell. The composition and procedures of the management and the regional contingency
Appendix B

engineering management cells are governed by GCCs. These cells are augmented by the staffs they support. The cells apply the commander’s intent, merge engineer support requirements, and arrange resources by—

- Establishing priorities and policies for theater construction and barrier materials.
- Establishing theater distribution protocols that are consistent with construction priorities.
- Monitoring and recommending construction asset allocation and use against priority operational requirements and recommending taskings for engine. assets.
- Developing construction standards and priorities.
- Providing input to the JCMEB.

B-11. The joint force commander may establish a joint environmental management board to help manage environmental requirements. The joint environmental management board is a temporary board, chaired by the combatant command or subordinate joint force engineer. Its members are from the joint force staff, components, and other required special activities (legal, medical, civil affairs). The board establishes policies, procedures, priorities, and the overall direction for environmental management requirements in a JOA. The joint environmental management board coordinates activities with the combatant command or subordinate joint force engineering staff. The joint environmental management board also provides guidance on the development of Annex L of the joint order, and, if appropriate, assumes responsibility for the preparation and appropriate updates of the annex.

B-12. The joint force commander may request an EH coordination cell unit to predict, track, distribute information on, and mitigate EHs within the theater that affect force application, focused logistics, survivability, and operational environment awareness. The EH coordination cell should establish and maintain an EH database, conduct pattern analysis, investigate explosive device detonations, and track EH areas. The cell provides technical advice on the mitigation of EHs (which includes developing tactics, techniques, and procedures and providing training updates to field units). The key capabilities of the EH coordination cell include—

- Establishing, maintaining, and sharing the EH-tracking database within the joint force.
- Ensuring the accuracy of EH information.
- Coordinating site evaluations or strike incident investigations.
- Conducting unit EH training.
- Developing the information collection plan with EH pattern analysis.
- Providing updated tactics, techniques, procedures, and guidance for route and area clearance operations.

B-13. Engineer participation in a number of other boards and cells is essential to joint mission accomplishment. Compared to the formal, nonstandard nature of the boards, cells are functionally oriented groups that meet on a regular basis. Engineer staff participation in and support to, these organizations will be significant; but the resultant exchange of relevant information is vital in maintaining situational awareness and facilitating the horizontal staff integration of the joint force engineer. Joint force engineer participation includes the following:

- **Joint planning group.** Engineers are represented on the joint planning group to enhance the formulation of joint force plans. The engineer planner ensures that joint force plans are supportable from an engineer perspective. Support by the rest of the joint force engineer cell with products facilitates engineer input and impact into the planning cycle. The engineer planner should leverage the rest of the engineer staff to provide products throughout the planning process. The key for the engineer is to ensure representation and establish hand-off procedures for products developed within all three planning horizons within the joint force—future plans, future operations, and current operations.

- **Joint intelligence support element.** Representation on the joint intelligence support element provides engineers with military intelligence related to infrastructure, hydrography, and other geospatial engineering and geospatial intelligence topics.

- **Joint operations center.** The joint operations center plans, monitors, and guides the execution of the joint force commander’s decisions. The joint force engineer maintains a presence and stays in close contact with the joint operations center. Engineers use this as the link to current operations.
The engineer watch officer is responsible for keeping the rest of the engineer staff situationally aware.

- **Joint targeting coordination board.** On the joint targeting coordination board, the joint force engineer contributes to the planning and integration of munition fields into the barrier plan and participates in target coordination to ensure critical infrastructure preservation. Remotely delivered mines that are scattered beyond the intended location and the related reporting, marking, and clearing of those mines are of concern to engineers. Joint force engineers should assure that implications on stability operations are considered during the targeting process for decisive operations. Engineer expertise can enable the joint force command to achieve desired effects with minimal long-term infrastructure damage and protection of significant cultural and natural resources in the operational area.

- **Information operations cell.** In the information operations cell, the joint force engineer coordinates with other staff elements on the preservation of critical adversary facilities and infrastructure. During stability operations, engineer reconstruction efforts focused on the HN can help support the commander’s strategic communications plan.

- **Civil-military operations center.** The civil-military operations center provides the joint force engineer command with a meeting place to coordinate nonmilitary activities with other agencies, departments, organizations, and the HN. If formed, the civil-military operations center is the focal point where engineers coordinate support to nongovernmental organizations. Outputs from the civil-military operations center (such as lists of intergovernmental and nongovernmental organization projects) are useful inputs into the JCMEB and help facilitate the unity of effort.

- **Joint logistics operations center.** Engineers are represented at the joint logistics operations center to respond to information received from the supporting command, Service components, and external sources for presentation to the combatant commander.

- **Force protection working group.** The force protection working group often generates engineer requirements as they develop or modifies JTF force protection policy and guidance. Examples include the hardening of key facilities and modifications to entry control points.

- **Special-purpose boards, centers, working groups, and cells.** Through necessity, new boards, centers, and cells may be formed and require engineer participation. For example, an EH threat working group may be required as a central clearinghouse for developing solutions to an EH problem within the JOA. Engineers should also have representation at the force protection and effects assessment working groups and boards. Engineer construction efforts, inside or outside the wire, are closely tied to the issues addressed at these working groups and boards.

**COMMAND POST CELLS**

B-14. In the context of command posts, a cell is a grouping of personnel and equipment according to warfighting function or purpose to facilitate mission command. There are functional and integrating command post cells. Functional cells group personnel and equipment by warfighting function, while integrating cells group personnel and equipment to integrate functional cell activities.

B-15. Integrating cells normally focus on different time horizons. For example, the plans cell focuses on the long-range time horizon, while the current operations cell focuses on the short-range time horizons. This is not to say that the functional cells do not integrate. However, the sustainment cell integrates numerous logistics areas and services and the fires cell integrates the contributions of all warfighting functions to targeting through the targeting working group. This integration generally focuses on maximizing the effects of a single warfighting function. Integrating cells focus the efforts of functional cells on planning, preparing for, or executing the overall operation within a time frame.

B-16. Functional cells and integrating cells are not single staff sections. In a sense, they are combined arms staff components. For example, in a corps main command post, G-2 section personnel often form elements of the intelligence, fires, current operations, and plans cells. The G-2 section forms elements of the intelligence, fires, current operations, and future operations cells in the tactical command post.

B-17. Not all cells are in every command post. For example, a battalion or brigade tactical command post is usually not divided into cells, but the entire tactical command post is the current operations cell. The cell is
Appendix B

composed of representatives from various staff sections. A corps operational command post, in contrast, has all cells except plans.
Appendix C

Engineer Running Estimate

The engineer running estimate is the continuous assessment of current and future operations to determine if the current operation is progressing according to the commander’s intent and if future operations are supportable. The engineer staff develops a running estimate to embody its evaluation of the situation and refines and maintains it based on new information that was gathered while monitoring the operation. The running estimate incorporates the staff tools used by engineers in planning, preparing, and executing an operation and represents a tangible form for continuous assessment. The engineer staff officer uses the running estimate to coordinate the unique perspectives of the various engineer staff elements supporting the headquarters. This appendix is intended as a tool for organizing the various aspects of the running estimate in engineer operations. (See FM 6-0 for the generic format for running estimates.)

MAJOR ACTIVITIES DURING OPERATIONS

C-1. Applications of engineer support efforts at the EAB must remain integrated within the combined arms framework. Integration enables a synchronized application of combat power, maximizing the effect to the engineering effort. The engineer staff at EAB or a joint force assists the commander by furnishing engineer advice and recommendations to the commander and other staff members; preparing those portions of plans, estimates, and orders that pertain to engineering; participating on boards and working groups as necessary; and coordinating and supervising engineer units and other activities within the span of control of the engineer staff. The running estimate is a tool used to assist the engineer staff in navigating the various processes and activities involved in operations while considering engineer combat power application.

C-2. The intelligence preparation of the battlefield is an integration process that is critical to planning success. The intelligence preparation of the battlefield is a systematic process of analyzing mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations. To be effective, the intelligence preparation of the battlefield must—

- Define the commander’s area of interest to focus collection and analysis on the relevant (having a significant effect on friendly and threat operations) aspects of the mission variables of enemy, terrain, weather, and civil considerations.
- Describe how each variable affects friendly operations and how terrain, weather, and civil considerations will affect the enemy.
- Provide the intelligence preparation of the battlefield products needed for each MDMP step according to the planning timelines and guidance provided by the commander.
- Determine how the interactions of friendly forces, enemy forces, and indigenous populations affect each other to continually create outcomes that affect friendly operations.

C-3. This aspect of intelligence preparation of the battlefield is not the sole responsibility of the intelligence staff. This complex analysis involves the commander and the staff working together to determine the effects. Intelligence preparation of the battlefield is most effective and best aids the commander’s decisionmaking when the intelligence staff integrates the expertise of the other staff and supporting elements into its analysis. The engineer must understand the intelligence staff officer (S-2) threat capabilities statement and situation template to analyze enemy engineer capabilities. Engineer reconnaissance may be required to support intelligence preparation of the battlefield, and the engineer staff must be proactive in recognizing these
requirements and tasking the appropriate engineer elements. The following are the intelligence preparation of the battlefield steps:

- **Step 1. Define the operational environment.** Defining the operational environment results in the identification of significant characteristics of the operational environment as they relate to the enemy, terrain, weather, and civil considerations that can affect friendly and enemy operations. This step results in the identification of gaps in current intelligence holdings.

- **Step 2. Describe the environmental effects on operations.** The staff describes how these characteristics affect friendly operations. The intelligence staff also describes how terrain, weather, civil considerations, and friendly forces affect enemy forces. The entire staff determines the impact and effects to the population of friendly and enemy force actions.

- **Step 3. Evaluate the threat.** The purpose of evaluating the threat is to understand how a threat can affect friendly operations. This is a detailed study of enemy forces (including enemy composition and organization, tactical doctrine, patterns of operation, weapons and equipment, and supporting systems). This step identifies threat capabilities based on threat missions and objectives.

- **Step 4. Determine threat COAs.** The staff identifies and develops possible threat COAs that can affect the accomplishment of the friendly mission. The staff will use threat COAs and other facts and assumptions about the operational environment to drive friendly COA analysis and influence friendly COA development.

C-4. Tactically focused echelons typically gain substantial initial context for their assessments from Army design methods being used by a higher echelon. Before receiving a mission, the running estimate consists of a broad analysis of the operational environment and assessment of engineer capabilities. Upon receipt of the mission, the running estimate parallels the MDMP and becomes focused on relevant information to assist the commander’s decisionmaking process.

C-5. The result of the MDMP is a concept of operations. The running estimate is refined through detailed consideration of engineer requirements in support of the concept of operations. Assessment involves each of the decisive-action elements (see table C-1).

### Table C-1. Decisive-action elements

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Offense</strong></td>
<td></td>
</tr>
<tr>
<td>Movement to contact</td>
<td>Planning begins by predicting adversary intent with a thorough understanding of the threat, threat engineer capabilities, and the terrain effect on operations.</td>
</tr>
<tr>
<td>Attack</td>
<td>Engineer planning tends to focus on mobility support, including a robust reconnaissance effort.</td>
</tr>
<tr>
<td>Exploitation</td>
<td>Engineer planning also includes planning to ensure a smooth, resourced transition from offensive to defensive or stability operations.</td>
</tr>
<tr>
<td>Pursuit</td>
<td>Engineer units tend to have command relationships to maneuver commanders.</td>
</tr>
<tr>
<td><strong>Defense</strong></td>
<td></td>
</tr>
<tr>
<td>Mobile defense</td>
<td>Planning begins by using terrain products to visualize how best to shape the terrain, which includes describing the best positions from which to defend.</td>
</tr>
<tr>
<td>Area defense</td>
<td>Engineer planning tends to focus on countermobility and survivability support, including a significant construction effort.</td>
</tr>
<tr>
<td>Retrograde</td>
<td>Construction planning includes security and survivability considerations. Engineer units tend to have support relationships to the maneuver commander except for those combat engineering forces that are task-organized to the reserve or mobile strike force.</td>
</tr>
</tbody>
</table>
Engineer Running Estimate

Table C-1. Decisive-action elements (continued)

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td></td>
</tr>
<tr>
<td>Civil security</td>
<td>• Assessment of the OE includes a greater focus on political and cultural</td>
</tr>
<tr>
<td>Civil control</td>
<td>• Engineer planning tends to focus on construction support, including engineer</td>
</tr>
<tr>
<td>Provision of essential services</td>
<td>• Engineer units will likely be distributed among echelons of command. Engineer</td>
</tr>
<tr>
<td>Governance</td>
<td>• Governance</td>
</tr>
<tr>
<td>DSCA</td>
<td>• Engineer planners consider statutes and regulations that restrict Army interaction</td>
</tr>
<tr>
<td>Support to civil law enforcement</td>
<td>• Engineer planning tends to focus on construction support, including engineer</td>
</tr>
<tr>
<td>Support to civil authority</td>
<td>• Engineer units will likely be distributed among echelons of command. Engineer</td>
</tr>
<tr>
<td>Provision of essential services</td>
<td>units tend to have support relationships to the maneuver commander; however,</td>
</tr>
<tr>
<td></td>
<td>• Engineer units tend to have support relationships to the maneuver commander;</td>
</tr>
<tr>
<td></td>
<td>• there are cases where responsiveness and proximity to higher engineer mission</td>
</tr>
<tr>
<td></td>
<td>• command dictate a command relationship.</td>
</tr>
</tbody>
</table>

Legend:
DSCA defense support of civil authorities
OE operational environment

CONTINUOUS REFINEMENT

C-6. As more detailed engineer requirements are refined in collaborative planning with subordinate echelons and headquarters, the engineer effort remains synchronized with the combined arms team by integrating across warfighting functions (see table C-2).

Table C-2. Planning integrated across warfighting functions

<table>
<thead>
<tr>
<th>Warfighting Function</th>
<th>Engineer Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement and Maneuver</td>
<td>• Analyze infrastructure to support operational deployment and movement.</td>
</tr>
<tr>
<td></td>
<td>• Evaluate mobility and countermobility required to preserve operational</td>
</tr>
<tr>
<td></td>
<td>• freedom of maneuver (including clearance, crossing, and terrain</td>
</tr>
<tr>
<td></td>
<td>• reinforcement considerations).</td>
</tr>
<tr>
<td></td>
<td>• Develop engineer force and capabilities estimates.</td>
</tr>
<tr>
<td></td>
<td>• Consider infrastructure improvements, reconstruction, and other nonlethal</td>
</tr>
<tr>
<td></td>
<td>applications for stability or DSCA operations.</td>
</tr>
<tr>
<td>Decide surface targets.</td>
<td>• Participate in the targeting process.</td>
</tr>
<tr>
<td>Detect and locate surface targets.</td>
<td>• Coordinate for command guidance on the employment of scatterable mines and other munitions.</td>
</tr>
<tr>
<td>Provide fire support.</td>
<td>• Assess effectiveness.</td>
</tr>
<tr>
<td>Integrate fires.</td>
<td>•</td>
</tr>
</tbody>
</table>

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Table C-2. Planning integrated across warfighting functions (continued)

<table>
<thead>
<tr>
<th>Warfighting Function</th>
<th>Engineer Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intelligence</strong></td>
<td></td>
</tr>
<tr>
<td>• Support force generation.</td>
<td>• Coordinate for geospatial information and products to enhance visualization of the OE, achieve situational understanding, and enable decisionmaking.</td>
</tr>
<tr>
<td>• Support situational understanding.</td>
<td>• Estimate threat engineer capabilities.</td>
</tr>
<tr>
<td>• Collect information.</td>
<td>• Gather and coordinate for obstacle information.</td>
</tr>
<tr>
<td>• Provide intelligence support to targeting and information capabilities.</td>
<td>• Disseminate specific EH, hazmat, or other recognition and warning information.</td>
</tr>
<tr>
<td>• Coordinate for geospatial information and products to enhance visualization of the OE, achieve situational understanding, and enable decisionmaking.</td>
<td>• Coordinate for engineer assessments and surveys for technical information requirements.</td>
</tr>
<tr>
<td><strong>Sustainment</strong></td>
<td></td>
</tr>
<tr>
<td>• Provide logistics.</td>
<td>• Determine base camp development and support estimates.</td>
</tr>
<tr>
<td>• Provide personnel services.</td>
<td>• Estimate real estate and other facility engineer support.</td>
</tr>
<tr>
<td>• Provide of health service support.</td>
<td>• Identify LOCs and other key routes, and determine support requirements for establishing and maintaining the distribution system.</td>
</tr>
<tr>
<td>• Provide movement control.</td>
<td>• Estimate area damage control and other construction support.</td>
</tr>
<tr>
<td>• Determine base camp development and support estimates.</td>
<td>• Determine the specialized engineer requirements (power, water distribution facility construction, firefighting).</td>
</tr>
<tr>
<td>• Estimate real estate and other facility engineer support.</td>
<td>• Prepare construction and barrier material estimates.</td>
</tr>
<tr>
<td>• Identify LOCs and other key routes, and determine support requirements for establishing and maintaining the distribution system.</td>
<td>• Prepare munitions estimates.</td>
</tr>
<tr>
<td>• Estimate area damage control and other construction support.</td>
<td>• Determine authorities, funding types, and levels of support.</td>
</tr>
<tr>
<td>• Determine the specialized engineer requirements (power, water distribution facility construction, firefighting).</td>
<td></td>
</tr>
<tr>
<td>• Determine authorities, funding types, and levels of support.</td>
<td></td>
</tr>
<tr>
<td><strong>Mission Command</strong></td>
<td></td>
</tr>
<tr>
<td>• Execute the operations process.</td>
<td>• Coordinate for geospatial products to enhance visualization of the OE, achieve situational understanding, and enable decisionmaking.</td>
</tr>
<tr>
<td>• Conduct knowledge management and information management.</td>
<td>• Establish and participate on boards, working groups, and cells.</td>
</tr>
<tr>
<td>• Synchronize information-related capabilities.</td>
<td>• Recommend command and support relationships.</td>
</tr>
<tr>
<td>• Conduct cyber-electromagnetic activities.</td>
<td>• Recommend control measures, priorities, standards, and reports.</td>
</tr>
<tr>
<td>• Conduct military deception.</td>
<td>• Establish and maintain liaison.</td>
</tr>
<tr>
<td>• Conduct CA operations.</td>
<td></td>
</tr>
<tr>
<td>• Conduct air space control.</td>
<td></td>
</tr>
<tr>
<td>• Install, operate, and maintain the network.</td>
<td></td>
</tr>
<tr>
<td>• Conduct information protection.</td>
<td></td>
</tr>
</tbody>
</table>
C-7. As engineer requirements are identified and continually refined, the engineer disciplines offer organization into categories of related capabilities and activities (see table C-3). The assessment of engineer requirements assists in tailoring the engineer force.

Table C-3. Capabilities and activities organized by engineer disciplines

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combat Engineering</td>
<td></td>
</tr>
<tr>
<td>Organic engineer elements</td>
<td>Conduct mobility</td>
</tr>
<tr>
<td>Force pool</td>
<td>Conduct countermobility</td>
</tr>
<tr>
<td>Joint (Marines)</td>
<td>Conduct survivability</td>
</tr>
<tr>
<td>Multinational</td>
<td></td>
</tr>
<tr>
<td>HN</td>
<td></td>
</tr>
<tr>
<td>General Engineering</td>
<td></td>
</tr>
<tr>
<td>Force pool</td>
<td>Restore damaged areas.</td>
</tr>
<tr>
<td>USACE FFE and CCA</td>
<td>Restore essential services.</td>
</tr>
<tr>
<td>Joint (Navy, Air Force)</td>
<td>Construct and maintain sustainment LOCs.</td>
</tr>
<tr>
<td>Multinational</td>
<td>Provide engineer construction support (including support to combat engineering activities).</td>
</tr>
<tr>
<td>HN</td>
<td>Supply mobile electric power.</td>
</tr>
<tr>
<td>Interagency</td>
<td>Provide facilities engineer support. (See ATP 3-37.10.)</td>
</tr>
<tr>
<td>Contract</td>
<td>Construct waste and distribution facilities.</td>
</tr>
</tbody>
</table>
COORDINATION AND CONTROL

C-8. A significant consideration for the integration of engineer capabilities is task-organizing engineer forces. Task organizing includes allocating available engineer assets to subordinate commanders and establishing command and support relationships. In some cases, engineer forces may be task-organized to subordinate nonengineer headquarters (for example, when a Sapper company is attached to a BCT or a clearance company is placed OPCON to a MEB). In most cases, an engineer brigade or battalion headquarters provides long-term mission command of tailored engineer forces and may be required at various echelons for the mission command of engineer operations at each level. Including the analysis of mission variables within the running estimate helps determine engineer task organization. (See ADRP 3-0 for command, support, and other relationships that may be established.) (See table C-4 for the task organization of engineer headquarters.)

Table C-4. Task organization of engineer headquarters

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC</td>
<td></td>
</tr>
<tr>
<td>• Provides mission command for task-organized Army engineer brigades and other engineer units and missions for the joint force, land component, or Army commander</td>
<td>• The TEC is the only organization designed for the operational command of engineer capabilities at echelons above corps level and often will provide mission command for the joint force command if an operational engineer headquarters is required.</td>
</tr>
<tr>
<td>• Deploys its main command post and two deployable command posts to provide flexibility and rotational capability</td>
<td></td>
</tr>
<tr>
<td>• Augments command posts with USACE FFE assets to enhance technical capabilities and joint or multinational assets to extend the span of control</td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- ATP: Army techniques publication
- CCA: contract construction agent
- FFE: field force engineering
- HN: host nation
- LOC: line of communication
- NGA: National-Geospatial Intelligence Agency
- USACE: United States Army Corps of Engineers
### Table C-4. Considerations for the task organization of engineer headquarters (continued)

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engineer Brigade</strong></td>
<td>One or more engineer brigades are required in the division or corps when the number of engineer units or the functional nature of engineer missions calls for brigade level mission command capability.</td>
</tr>
<tr>
<td>• Is capable of conducting engineer missions and controlling up to five mission-tailored engineer battalions (including capabilities from the engineer disciplines)</td>
<td>• Most operations or contingencies requiring the deployment of the corps headquarters in one of its configurations will also require an engineer brigade headquarters element.</td>
</tr>
<tr>
<td>• Integrates and synchronizes engineer capabilities across the supported force</td>
<td>• The functional engineer brigade, unlike a BCT or MEB is not designed to control terrain. It would require significant augmentation to accomplish such a mission.</td>
</tr>
<tr>
<td>• Can deploy its main command post or two deployable command posts to provide flexibility and rotational capability</td>
<td></td>
</tr>
<tr>
<td>• May serve, with augmentation, as a joint engineer headquarters and may be the senior engineer headquarters deployed in a JOA if full TEC deployment is not required</td>
<td></td>
</tr>
<tr>
<td>• Can be augmented with USACE FFE assets to enhance technical capabilities</td>
<td></td>
</tr>
</tbody>
</table>

| **MEB**                                                                     |                                                                                                                                                   |
| • Designed to provide mission command of forces from multiple branches but especially those that conduct maneuver support operations for the force | Each division conducting major combat operations will be supported by at least one MEB. Divisions conducting contingency operations will typically also be supported by a MEB. |
| • Employs task-organized forces to conduct decisive action in support of Army division, echelons above division, joint, interagency, or multinational headquarters | • The MEB is primarily designed to provide support to the division but is also capable of being employed to provide support to higher-echelon, joint, and multinational organizations. |
| • Capable of operating across the spectrum of conflict to support, reinforce, or complement offensive and defensive major combat operations and can support or conduct stability or DSCA operations | • The ability of the MEB, when given control of an AO, to integrate and synchronize engineer capabilities outside its AO is degraded. |
| • The MEB, unlike the engineer brigade, is staffed and trained to provide mission command of an assigned AO and control terrain. In this regard, it is similar to a BCT, but without the inherent maneuver capability |                                                                                                                                                |

| **Engineer Battalion**                                                      |                                                                                                                                                   |
| • Capable of conducting engineer missions and controlling any mix of up to five mission-tailored engineer companies | An engineer battalion headquarters may be required for the mission command and sustainment of modules when two or more engineer modules are task-organized in support of a BCT, MEB, engineer brigade, or other unit. |
| • Are capable of providing mission command for combat or general engineering missions Except the prime power battalion which performs a specific technical role when task-organized to perform those roles | • The engineer battalion is typically found within the MEB or in support of a BCT. |
| • The engineer battalion will receive survey and design or EH teams to facilitate construction or EH clearance missions. |                                                                                                                                                |

**Legend:**
- AO: area of operations
- BCT: brigade combat team
- DSCA: defense support of civil authorities
- EH: explosive hazard
Table C-4. Considerations for the task organization of engineer headquarters (continued)

<table>
<thead>
<tr>
<th>Legend (continued):</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFE</td>
</tr>
<tr>
<td>JOA</td>
</tr>
<tr>
<td>MEB</td>
</tr>
<tr>
<td>TEC</td>
</tr>
<tr>
<td>USACE</td>
</tr>
</tbody>
</table>

C-9. Aided by staffs, commanders exercise control over all forces in the AO (including the airspace over the AO). Staffs provide control and keep commanders informed. Likewise, the operator establishes maneuver graphics, boundaries, axes of advance, and fire support coordination lines to control fires and maneuver and the engineer employs standards, priorities, engineer work lines, and obstacle-free zones. The engineer staff is responsible for establishing functional control (through the commander) of engineers, which may include—

- Establishing policies and construction standards.
- Assigning priorities (funding, construction, priority of effort, priority of support).
- Delegating authority (to employ family of scatterable mines or other munitions).
- Assigning missions and tasks to subordinates.
- Establishing engineer portions of plans and orders (including their components and subordinate plans), such as—
  - Unit mission.
  - Task organization.
  - Concept of operations.
  - Project lists.
  - Engineer task information collection.
- Establishing graphic control measures (including engineer work lines).

C-10. Some of these control measures are put forth by the GCC and joint force commander while others are established by the ASCC and the JFLCC. The engineer staff is responsible for coordinating and establishing control mechanisms, which may include—

- Performing routine reports and returns.
- Using the staff engineer cells and supporting engineer headquarters organizations to gather and refine information requirements that impact engineers within the AO.
- Establishing and maintaining effective communication with supporting engineer staff cells, engineer units, and multifunctional command posts.
- Using the running estimate and the continuous link with supporting elements to compute resource and force requirements and recommend priorities and task organization.
- Developing specific missions and conveying them to subordinates through orders and annexes.
- Using supporting unit command posts to assess, report, and anticipate change and unforeseen requirements.

C-11. Risk management is an integration process that occurs during the operations process. Risk management is the process of identifying, assessing, and controlling hazards that arise from operational factors and balancing that risk with mission benefits (see ATP 5-19).

C-12. Planning offers a premium opportunity for integrating engineer operations. However, the engineer effort is truly an integrated application within the combined arms operation only by participation throughout the operations process. The engineer staff uses the running estimate as a basis for participation in various activities during preparation and execution. Likewise, through participation in these activities the running estimate is continually refined and updated. Maintaining the running estimate is one of the staff functions that directly contribute to controlling ongoing operations and planning for future operations. The construct of the running estimate also provides a framework for organizing and arranging information displays within the command post or cell.
C-13. During preparation and execution, staffs analyze the situation within their fields of interest in terms of the mission variables needed to maintain running estimates. Maintaining the running estimate helps the staff make recommendations (within their areas of expertise) to support the commander’s decisionmaking. Staffs also use the running estimate to offer recommendations to other staff elements and subordinate commanders (for information and assistance only). Staff recommendations may be in writing but are usually presented orally during preparation and execution. Presentations may be formal or informal and in the form of briefings, written estimates, or staff studies.

C-14. During preparation, running estimates continue to track resource status. The priority for assessment is answering intelligence requirements, friendly force information requirements, priority civil information requirements, and commander’s critical information requirements that fall within the engineer area of expertise.

C-15. During execution, running estimates focus on identifying variances, assessing their effect on end state achievement, and recommending corrective actions to keep the operation within the commander’s intent. Assessments also address the supportability of possible sequels and future operations.
# Glossary

The glossary lists acronyms with Army or joint definitions.

## SECTION I – ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADP</td>
<td>Army doctrine publication</td>
</tr>
<tr>
<td>ADRP</td>
<td>Army doctrine reference publication</td>
</tr>
<tr>
<td>AO</td>
<td>area of operations</td>
</tr>
<tr>
<td>AR</td>
<td>Army regulation</td>
</tr>
<tr>
<td>ASCC</td>
<td>Army Service component command</td>
</tr>
<tr>
<td>ATP</td>
<td>Army techniques publication</td>
</tr>
<tr>
<td>attn</td>
<td>attention</td>
</tr>
<tr>
<td>ATTP</td>
<td>Army tactics, techniques, and procedures</td>
</tr>
<tr>
<td>BCT</td>
<td>brigade combat team</td>
</tr>
<tr>
<td>COA</td>
<td>course of action</td>
</tr>
<tr>
<td>DA</td>
<td>Department of the Army</td>
</tr>
<tr>
<td>DC</td>
<td>District of Columbia</td>
</tr>
<tr>
<td>DOD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>DODD</td>
<td>Department of Defense directive</td>
</tr>
<tr>
<td>DSCA</td>
<td>defense support of civil authorities</td>
</tr>
<tr>
<td>EAB</td>
<td>echelons above brigade</td>
</tr>
<tr>
<td>EH</td>
<td>explosive hazard</td>
</tr>
<tr>
<td>EP</td>
<td>engineer publication</td>
</tr>
<tr>
<td>ESP</td>
<td>engineer support plan</td>
</tr>
<tr>
<td>FFE</td>
<td>field force engineering</td>
</tr>
<tr>
<td>FM</td>
<td>field manual</td>
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<tr>
<td>G-2</td>
<td>assistant chief of staff, intelligence</td>
</tr>
<tr>
<td>G-3</td>
<td>assistant chief of staff, operations</td>
</tr>
<tr>
<td>GCC</td>
<td>geographic combatant command</td>
</tr>
<tr>
<td>HN</td>
<td>host nation</td>
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<tr>
<td>J-2</td>
<td>intelligence directorate of a joint staff</td>
</tr>
<tr>
<td>J-3</td>
<td>operations directorate of a joint staff</td>
</tr>
<tr>
<td>J-4</td>
<td>logistics directorate of a joint staff</td>
</tr>
<tr>
<td>J-7</td>
<td>engineering staff section of a joint staff</td>
</tr>
<tr>
<td>J-8</td>
<td>force structure, resource, and assessment directorate of a joint staff</td>
</tr>
<tr>
<td>JCMEB</td>
<td>joint civil-military engineering board</td>
</tr>
<tr>
<td>JFLCC</td>
<td>joint force land component command</td>
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<tr>
<td>JOA</td>
<td>joint operations area</td>
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<tr>
<td>JP</td>
<td>joint publication</td>
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>JTF</td>
<td>joint task force</td>
</tr>
<tr>
<td>LNO</td>
<td>liaison officer</td>
</tr>
<tr>
<td>MDMP</td>
<td>military decisionmaking process</td>
</tr>
<tr>
<td>MEB</td>
<td>maneuver enhancement brigade</td>
</tr>
<tr>
<td>MO</td>
<td>Missouri</td>
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<tr>
<td>MSCoE</td>
<td>Maneuver Support Center of Excellence</td>
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<tr>
<td>No.</td>
<td>number</td>
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<tr>
<td>OPCON</td>
<td>operational control</td>
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<tr>
<td>PIN</td>
<td>product identification number</td>
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<tr>
<td>PL</td>
<td>public law</td>
</tr>
<tr>
<td>S-2</td>
<td>intelligence staff officer</td>
</tr>
<tr>
<td>SIPRNET</td>
<td>Secret Internet Protocol Router Network</td>
</tr>
<tr>
<td>TEC</td>
<td>theater engineer command</td>
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<tr>
<td>TM</td>
<td>technical manual</td>
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<tr>
<td>U.S.</td>
<td>United States</td>
</tr>
<tr>
<td>USC</td>
<td>United States code</td>
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**SECTION II – TERMS**

None
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These documents must be available to the intended users of this publication.


RELATED PUBLICATIONS
These documents contain relevant supplemental information.

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RAYMOND T. ODIERNO
General, United States Army
Chief of Staff

Official:

GERALD B. O’KEEFE
Administrative Assistant to the
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