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ALLIED JOINT DOCTRINE FOR MILITARY ENGINEERING

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NORTH ATLANTIC TREATY ORGANIZATION

ALLIED JOINT PUBLICATION

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NATO LETTER OF PROMULGATION

20 June 2014

1. The enclosed Allied Joint Publication AJP-3.12 Edition B Version 1 ALLIED JOINT DOCTRINE FOR MILITARY ENGINEERING, which has been approved by the nations in the Military Committee Joint Standardization Board, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 2238.
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Director NATO Standardization Agency

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RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
ITA	<p>- Italy, in accordance with national law, will not use any device which may be classified as antipersonnel mine according to the following definition "An antipersonnel mine is defined as a device which may be placed above, under, inside or next to any surface and adjusted or adapted with specific measures in order to explode, cause an explosion or release incapacitating substances as the result of the presence, the proximity or contact by a person". Moreover, considering military activities in a multinational scenario, cooperation of the Italian Armed Forces also with no signatory Nations of the Ottawa Convention is permitted, with the proviso that activities by Italian servicemen be compatible to the Ottawa regulations;</p> <p>- Italy, in accordance with national regulation, considers environmental protection (EP) an all Commanders responsibility, led by logistic branch. The support of Military Engineering encompasses all the necessary technical activities, assessed by the logistic and by the EP advisors, in order to prevent or mitigate adverse environmental impacts.</p>
LVA	In accordance with established structure of National Armed Forces of Latvia, EOD, environmental protection and maintenance of infrastructure is provided by other agencies and services, not by military engineers.
<p>Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.</p>	

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PREFACE

1. The successful execution of military engineering support to joint operations requires clear doctrine which is fully understood by the whole force; this is especially important when operations are to be conducted by allied or coalition forces.
2. AJP-3.12(B) describes the fundamental aspects of military engineering and provides guidance for the planning and conduct of these in support of joint operations. Joint operations are complex and include tasks that span the range of operations, from humanitarian aid to combat. Most operations will take place in all of the domains (air, land, maritime) while some will predominantly favour a single domain. The level of joint participation may vary and is likely to include non-military agencies, institutions or organizations. Like all doctrine, this AJP is authoritative but requires judgement in application.
3. The main difference between AJP-3.12(A) and AJP-3.12(B) is that this publication better reflects the NATO Command Structure (NCS), the linkage between capstone joint doctrine document AJP-01(D) and keystone joint doctrine documents AJP-3(B), the other keystone doctrine documents and the level-2 supporting joint doctrine publications.
4. The key theme underlying this publication is that military engineering is both an inherent requirement of all joint functions, but also a joint function per se. All military engineering support to joint operations can fundamentally be approached in the same manner because NATO forces must expect to perform a wide range of potentially simultaneous activities. AJP 3.12(B) focuses on the synchronization and coordination of military engineering activities during the preparation, execution and termination of an operation.
5. POC for AJP-3.12(B) is the NATO Military Engineering Centre of Excellence, Comm.: +49-841-88660-5450, Email: specsptch@milengcoe.org.

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CHAPTER 1 – PRINCIPLES

SECTION I - Introduction

0101. AJP-3.12(B) describes the fundamental aspects of Military Engineering (MILENG) and provides guidance for the planning and conduct of these in support of joint operations.

SECTION II – Comprehensive approach

0102. Current operations continue to highlight the importance of MILENG throughout all stages of an operation in supporting, enabling and sustaining the force. Demands for MILENG support are likely to exceed capacity so the approach to providing MILENG support has always been inherently comprehensive, bringing diverse resources to bear to achieve the mission¹. A comprehensive approach provides the conceptual framework for the continuous effective integration and coordination of international organizations (IO); national governments and their departments and agencies; non-governmental organizations (NGO); the private sector and military forces in an alliance or coalition². The successful implementation of a comprehensive approach requires that all the involved components understand the agreed objectives, end state and precepts, principles and, contribution of each contributing organization. In its interaction with non-NATO actors, NATO will continue to act in accordance with the implementation of The Comprehensive Approach Action Plan³.

Section III – Implications for military engineering

0103. **Effective MILENG.** The delivery of an effective MILENG capability is essential for operational success. This applies to preparation, execution and recovery across the continuum of potential NATO-led joint operations. Earliest involvement of MILENG in campaign and operational-level planning ensures unity of effort as well as the effective employment of MILENG resources.

0104. **Planning relations.** When NATO contributes to a comprehensive approach, relations between allied military engineering formations, national authorities, civil populations, national and international organizations, and other agencies will be complex, yet interdependent. Integrated planning and the development of close, effective, relationships at all levels between military engineers and the relevant civilian organizations and agencies must precede a military deployment and must

¹ See MC 0560/1

² See AJP-01(D) and AJP-3(B)

³ See C-M 92008) 0029 (COR 1), Proposal a Way Ahead on Comprehensive Approach, 02 April 2008.

be maintained throughout an operation. This requires individual understanding and engagement. Operational success is predicated upon effective cooperation.

0105. **Stabilization and reconstruction (S&R).** While NATO might contribute or take the lead in providing security to enable a stable environment, reconstruction will be driven by government agencies as well as civilian actors as they are better suited to conduct such tasks. In any case, Alliance military forces must be able to perform some of the needed tasks, when requested and mandated, in case the primary civilian actor is not available or the demand for the needed capabilities exceeds civil capacities.
0106. **Disaster Relief.** NATO may deploy national military capabilities in support of the civil authority overseeing an emergency. This may occur as an integral part of an existing NATO operation or in any other area as the emergency dictates. NATO policy for military support for international disaster relief operations is outlined in MC 343, which describes the use of "Military and Civil Defence Assets". The North Atlantic Council (NAC) is the approving authority for the use of collective Allied military resources for such civil activities.

Section IV – Scope of military engineering

0107. **Military engineering** is the *'engineer activity undertaken regardless of component or service to shape the physical operating environment'*⁴.
0108. Military engineering provides commanders with the means to use terrain in a manner that best meets campaign and operations' objectives by applying a range of skills such as field, construction, environmental and geospatial engineering. In applying these skills, all joint functions at all levels of operations are supported⁵. Specialist areas of expertise are environmental protection (EP), infrastructure development, and geospatial engineering support. Significant support is also provided to Countering-Improvised Explosive Devices (C-IED), utility production, route clearance, camp sustainment, post-construction monitoring and explosive ordnance disposal (EOD).

Section V – Military engineering at the different levels

0109. **Strategic Level.** A MILENG advisor and staff division within the strategic command (SC) headquarters (HQ) ensures that four primary areas are addressed:

⁴ MC 0560/1. MILENG does not encompass the activities undertaken by those 'engineers' who maintain, repair and operate vehicles, vessels, aircraft, weapon systems and equipment.

The physical part of the operating environment being shaped is the terrain.

⁵ See AJP-01(D). Joint functions: manoeuvre, fires, command and control, intelligence, information operations, sustainability, force protection and civil-military cooperation.

- a. Force planning for MILENG capabilities within the framework of the NATO Defence Planning Process.
 - b. MILENG policy and doctrine developments.
 - c. Infrastructure aspects within the framework of the NATO Security Investment Programme (NSIP).
 - d. Planning and conduct, at the strategic level, of the MILENG aspects in operations and exercises.
0110. SHAPE MILENG staff primarily focuses on the provision of military engineering guidance, means and capabilities to support operations. It provides strategic level planning, coordination and control, as well as general staff support and specialized advice, on all aspects of military engineering for operations and exercises. Infrastructure being a critical aspect for enabling and sustaining force deployments; it places a heavy demand on MILENG capabilities, especially in terms of contracted support requirements. However, the requirement for combat support must not be ignored.
0111. MILENG staff will advise the strategic commander for operations and the staff, as appropriate, on the following areas of interest:
- a. The impact of terrain and infrastructure on plans and operations.
 - b. MILENG force generation requirements.
 - c. Strategic deployment and redeployment, including reception, staging and onward movement:
 - (1) MILENG contract requirements including land use requirements.
 - (2) MILENG support needed to maintain lines of communications (LOC).
 - d. Recommended strategic priorities for MILENG support.
 - e. MILENG considerations affecting the joint targeting process.
 - f. Strategic guidance and policy for MILENG support to:
 - (1) EOD.
 - (2) Countering-Improvised Explosive Device (C-IED).
 - (3) Force Protection (FP).

- (4) Infrastructure standards and funding.
 - (5) Environmental Protection (EP).
 - (6) Humanitarian assistance.
 - (7) Civil authorities.
- g. Input to rules of engagement.
 - h. MILENG interoperability, standardization and cooperation.
 - i. Assistance and coordination of management of class IV supplies with logistic staffs.
 - j. Host nation (HN) engineer capability, capacity and concurrence with NATO standards.
0112. **Operational Level.** The Joint Force Commander (JFC) will be advised by the Joint Force Engineer⁶ (JFENGR), on MILENG issues relating to execution of operational responsibilities⁷. Priorities for engineer activities and associated allocation of resources will be determined in the operational-level planning process (OLPP) in which the JFENGR and staff must play a full part. The JFENGR also acts as the coordinating authority over MILENG and EOD assets across all components⁸. Within limitations and policies established by the strategic HQ, the JFENGR advises the JFC as detailed in chapters 3 and 4.
0113. **Tactical Level.** Although there may be a greater focus on manoeuvre support, survivability and longer-term sustainment will be necessary within all components. Military engineering tactical doctrine for land forces is well established and the use of terms such as mobility, counter mobility and survivability to categorize engineer activities remains valid. Although tactical-level military engineering is most intimately concerned with shaping the terrain, the benefits do not accrue solely to the land component. For example, engineers at the tactical level support the maritime component (e.g., enabling the use of land port facilities or supporting amphibious operations by developing beachheads), air component (e.g., by developing airfield infrastructure), the Joint Logistic Support Group (JLSG) (e.g., by developing infrastructure for logistics) and, if generated, a Special Operations Component Command (SOCC).

⁶ AAP-6. Here, the term JFENGR is used generically and should be taken to include the equivalent chief engineer at all levels.

⁷ For details see Bilateral Strategic Command (Bi-SC) 80-90 (NATO Task List).

⁸ See AJP-3(B) Section XII Supported/Supporting relationships.

Section VI – Military engineering forces and resources

0114. Assigned MILENG capabilities are essential to ensure that the JFC has the resources at his disposal to execute theatre-level engineering tasks. While such capabilities may be provided by Alliance nations, there will be occasions when operational-level engineering has to be provided and financed from NATO common funds. If the situation requires, the NSIP will provide the funds for infrastructure to support the joint force. Host-nation support (HNS), civilian actors and contractors may play an essential role in providing engineer support to the joint force. The degree of reliance upon HNS will vary according to the joint operations area (JOA) and the nature of the operation. The force must also be prepared to integrate other partner and non-NATO nations' forces, including engineer elements.
0115. Assigned forces to each component, the JLSG and a SOCC will include a range of MILENG capabilities appropriate to the component's mission. A flexible approach is needed to provide cross-component engineer support when necessary to meet the JFC's intent. This will be particularly critical if MILENG support is required to reinforce other components at key stages in the campaign.

Section VII - Summary

0116. Expeditionary operations have re-emphasized the Alliance's requirement for multi-faceted and coordinated MILENG support. This requires appropriate structures and establishments across the NATO command structure, NATO force structure and across deployed joint forces.

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CHAPTER 2 - MILITARY ENGINEERING COMMAND AND CONTROL

Section I – Introduction

0201. The Alliance relies on a combination of the NATO Command Structure (NCS) and the NATO Force Structure (NFS) to provide command and control (C2) for operations. There are a number of options available for NATO to organize command, control and coordination on a routine basis and during a period of emerging crisis. The chosen option will depend upon the nature, scale, complexity and location of the operation and will dictate the command arrangements and the levels of command. The key to understanding and adapting C2 arrangements is flexibility. At the first command level, SACEUR is responsible for the overall planning, direction, command and conduct of all Alliance military matters and activities within his AOR and beyond, as directed. SACEUR will normally delegate Operational Control (OPCON) to an operational commander, at an appropriate moment, once the force has been constituted or deployed into the Joint Operations Area (JOA). SHAPE can command theatre level operational Headquarters (HQ) directly.

In accordance with MC 0560/1 *Military Committee Policy for Military Engineering*, the provision of effective Military Engineering (MILENG) support requires appropriate command and staff structures and C2 arrangements. This chapter outlines the principles, structures and arrangements for effective MILENG C2.

Section II – Military engineering command and control principles

0202. **MILENG advisor concept.** The senior military engineer at each level is the principal advisor to the commander in all aspects of MILENG. This is implemented at the strategic level by the Allied Command Operations (ACO) Senior Joint Engineer, at the operational level by the Joint Force Engineer (JFENGR) and at the tactical level by the Chief Engineer. The overall commander's priority for the allocation of engineer effort must be communicated to and appropriately supported by other functional areas; the senior military engineer exercises coordination on behalf of the commander over the allocation of MILENG resources.
0203. **Centralized control, decentralized execution.** The most effective use of scarce resources will be achieved by a military engineer and staff, properly established at each level, able to task-organise multinational assets in accordance with the overall commander's priorities, throughout an operation; responsibility for executing tasks should be delegated to the lowest appropriate level of MILENG command.

0204. The overarching principles of unity of effort, continuity, clarity, decentralisation and integration of command should always be applied in C2⁹. Wherever two or more elements of MILENG capability are assigned to any HQ they may be under the C2 of a MILENG formation HQ. However organized, there should be a single MILENG staff to advise the HQ commander.

Section III - Military engineering command and control principles in SHAPE

0205. The ACO Senior Joint Engineer is responsible for providing direct advice to the commander and his command group on all MILENG issues as well as guidance and coordination to the subordinate MILENG staffs in ACO, in order to support SACEUR exercising his command functions.

Section IV – SHAPE Engineer staff organization

0206. The Joint Engineering Division is headed by the Assistant Chief of Staff Joint Engineering (ACOS JENG), who is double-hatted as ACO Senior Joint Engineer. It encompasses two branches: Plans and Operations Branches.
0207. The MILENG Plans Branch is responsible to ACOS JENG for providing the MILENG input and cross functional support at the strategic level and coordinating all MILENG inputs to all ACO plans. It further provides MILENG expertise for NATO MILENG policy, doctrine, defence planning, force generation, training, procedures & standardisation; coordinates infrastructure aspects of NSIP in NATO countries and NATO HQs capability packages and plans, develops and implements at the strategic level the environmental management policy, doctrine, procedures & standardisation.
0208. The MILENG Operations Branch is responsible to ACOS JENG for strategic level MILENG support to the command and control of all theatre-operations and exercises and provides the MILENG feedback on all NATO operational lessons identified / learned process. It further manages the MILENG aspects of the intelligence cycle; manages and coordinates the Infrastructure aspects of the NSIP in operations; and contains specialist expertise for Explosive Ordnance Disposal (EOD) and MILENG support to Force Protection (FP), Countering-Improvised Explosive Device (C-IED), and military search operations.

⁹ MC 400/3.

Section V – Military engineering command and control principles in Joint Force Headquarters

0209. The JFENGR is the principal advisor to the Joint Force Commander (JFC) on all MILENG issues¹⁰. Key roles for the JFENGR will be to advise the JFC on available engineer assets and to coordinate the engineer effort across the components. On behalf of the JFC, the JFENGR will have coordinating and technical authority over the allocation of MILENG resources throughout the joint force in order to ensure that capabilities and resources are used most effectively.
0210. The JFENGR must ensure that strategic direction and guidance is communicated clearly to the force engineers in the form of unambiguous missions and policies. Priorities must be clear to commanders at all levels if MILENG capabilities, including manpower and materiel, are to be used effectively.
0211. In order to ensure optimum efficiency, use of available resources is to be planned centrally. It is of the utmost importance that the JFENGR staff is fully integrated early in the planning and execution of operations. JFENGR staff is responsible to the JFC for providing clear, focused and timely advice and support. In most cases, execution of tasks will be decentralised and delegated to the lowest appropriate level of command. This may include MILENG capabilities of own forces, host nations, contractors, international organizations, other organizations and agencies, as available and willing to support.
0212. At any given stage of an operation the JFC may shift the main effort of MILENG support between components in alignment with the campaign main effort. This may include the allocation of assets normally seen supporting manoeuvre to infrastructure development and sustainment or mobility support in any JOA.

Section VI – Joint force engineer staff organization

0213. Well-structured and robust MILENG staffs are essential at all levels of headquarters¹¹. Wherever possible, peacetime establishments should reflect deployed operational organizations. At the operational level of the NCS the MILENG staff division is an independent¹² staff division placed under Deputy Chief of Staff Support and structured as follows:
- a. **JFENGR.** JFENGR is responsible for providing MILENG advice and coordination on all matters for NATO operations and activities within the areas of collective defence, in-theatre and out-of-area contingencies, and

¹⁰ MC 0560/1.

¹¹ MC 0560/1.

¹² See AJP-3(B)

NATO Partner engagement.

- b. **Engineer Plans Branch.** The branch participates in the joint HQ's operational-level planning for all potential operations, including collective defence, emergency response and expeditionary operations. It is also responsible for providing engineers to manage and oversee the use of infrastructure within the assigned area of responsibility (AOR).
 - c. **Engineer Operations Branch.** The branch is responsible for synchronizing engineer efforts and advising on the appropriate employment of subordinate engineer units. It gathers critical engineer information in order to support the joint HQ's operational-level planning efforts and shares information with key non-NATO actors in theatre in order to optimize MILENG support to them in accordance with NATO security policies. The branch contains the core of the Combined Joint Explosive Ordnance Disposal Cell (CJEODC)¹³, as well as engineers to deploy as part of an operational liaison and reconnaissance team.
0214. Support to logistics is a significant MILENG missions on operations. If a multinational Joint Logistic Support Group (JLSG) is formed, a military engineering and infrastructure branch¹⁴ will be established in the JLSG to plan and coordinate the provision of MILENG support within the supported JFC's AOR. The branch will coordinate its advice to commander JLSG with JFENGR in order to ensure conformity with the JFC's operational MILENG priorities.
0215. Central coordination is essential to the efficient employment of specialist engineer capabilities. Consideration should always be given to retaining control of specialist engineer resources such as geospatial engineering, well drilling, pipeline, railway construction / repair, dredging, and technical reconnaissance at the highest practical level. National caveats regarding the employment of contributed specialist MILENG capabilities can adversely impact the ability of the JFC to employ them. As such, caveats should be identified as early as possible so that mitigation measures can be created.

¹³ The affiliation of EOD to MILENG varies within NATO Nations, therefore command status of all EOD forces participating in an operation, coordinating authorities and tasking authorities will be clearly defined both in operation orders and within national and international directives. A CJEODC is to be established in the operational joint force HQ as the focal point for all EOD matters. It is responsible for advising the JFC and coordinating EOD matters with troop contributing nations and other organizations. The JFENGR remains the primary advisor on all mobility support issues.

¹⁴ See also AJP-4.6 (B)(SD) for more details.

Section VII – Summary

0216. Military Committee policy states that commanders at all levels need a MILENG advisor supported by a staff to ensure the efficient employment of scarce MILENG resources. The effectiveness of the senior military engineer and staff at each level will depend on close cooperation and coordination between staff at all levels and across all components. The involvement of military engineer staff in planning activities from the outset is essential and is the responsibility of the planning staff of any and all operations in order to determine engineer participation and ability to support the operations being planned.
0217. The ACO Senior Joint Engineer is responsible for providing direct advice to the commander and his command group on all MILENG issues and further guidance and coordination to the subordinate MILENG staffs in ACO.
0218. The JFENGR staff must coordinate, at the earliest opportunity, with all other staff elements in order to plan, coordinate, integrate and synchronize effective MILENG support to the operation. The JFENGR staff must also cooperate and coordinate closely with appropriate HN authorities, troop-contributing nations, civil organizations and agencies.
0219. In consultation with the JFC / operational-level staff and tactical-level staff, the JFENGR exercises coordinating authority over all theatre MILENG assets.

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CHAPTER 3 – MILITARY ENGINEERING PLANNING

Section I – Introduction

0301. Early identification of required Military Engineering (MILENG) capabilities is critical and demands the involvement of MILENG staff in the planning and reconnaissance process from the outset, and throughout the whole operation. MILENG support is required to ensure that factors such as terrain and infrastructure, which may constrain the planning options, are fully considered. Essential information, such as which non-military capabilities will be available and when, will influence the force generation process. This chapter outlines the MILENG input to the different levels and phases of planning¹⁵.

Section II – Planning at the strategic level

0302. At the strategic level, MILENG planning, through the Estimate and Options Group and Response and Direction Group, helps set the stage for NATO operations. Based on ministerial guidance, intelligence assessments and operations planning, the senior joint engineer staff provides input to the force generation process by identification of engineer force levels and capabilities required, for consideration by nations. At the same time, MILENG staff assesses the plans to identify critical infrastructure and develop capability packages or urgent requirements to meet planning requirements in association with the infrastructure development plan. The provision of funding for operationally required infrastructure will be accomplished using NSIP mechanisms if Host Nation (HN) or lead nation solutions are not available. Infrastructure requirements to address operational shortfalls may be met by activation and, if necessary, acceleration of existing capability packages or by authorization of engineer projects as urgent requirements. Engineer advice on operational infrastructure requirements will assist financial controller staff at the strategic level in determining disbursement of funding authorized by the NATO Investment Committee. Requirements, normally generated at the tactical level, are validated and endorsed at the operational level and then submitted to the strategic level. The strategic level screens, harmonizes and consolidates requirements before submitting them to NATO HQ. Generic Host-Nation Support (HNS) Memorandum of Understanding is established to facilitate operations. Finally, strategic-level staff work through other planning requirements as identified in the Bi-Strategic Command (Bi-SC) Directive 80-90 NATO Task List.

0303. The activities described in the paragraph above enable the strategic level to provide direction and guidance to operational-level commanders and allows the operational-

¹⁵ Allied Joint Doctrine for operational-level planning provides all details for planning. In addition the ACO Comprehensive Operations Planning Directive (COPD) and the respective Functional Planning Guides are the tools to be used for the planning process.

level planning process to proceed. This direction and guidance from the strategic level will include: limitations on the conduct of the joint campaign and the targeting process, the strategic deployment of forces, consideration of participation by non-NATO countries, and barrier, Countering-Improvised Explosive Device (C-IED) and Explosive Ordnance Disposal (EOD), Environmental Protection (EP) plans, priorities, resources and resource limitations. All of these will impact on the engineer support annex (usually Annex EE) to the Operation Plan (OPLAN).

0304. General criteria and standards for NATO common-funded infrastructure projects will be decided at the strategic level¹⁶. Nevertheless, engineers employed on infrastructure and other MILENG tasks must conform to the construction specifications and standards of the HN¹⁷. When infrastructure is required in areas / countries where no HNS is available, Allied Command Operations (ACO), or a designated NATO agency, will act as HN for implementing identified infrastructure requirements. The delineation of roles and responsibilities, and the allocation of tasks between the strategic and operational levels will be decided during the planning process.
0305. The strategic level is responsible for reviewing the Joint Force Commander (JFC)'s Concept of Operations (CONOPS) and Combined Joint Statement of Requirements (CJSOR) for forces. Upon acceptance of the CJSOR by ACO, nations are contacted for contributions to satisfy the requirements. Within this process the Joint Force Engineer (JFENGR) staff input to the force generation process is essential and should take into account:
- a. Likely tasks.
 - b. The operational environment.
 - c. Availability, quality and reliability of HNS and contractors.
 - d. Possible contribution and capabilities of partner and other non-NATO countries.
 - e. The requested timing of reception, staging and onward movement and eventual transfer of authority for MILENG forces in the Joint Operations Area (JOA).
0306. Funding for reconstruction will normally come from civilian sources and will be used by non-military organizations. MILENG staff must be knowledgeable on civil funding streams and the regulations for their use.

¹⁶ See ACO 80-25 ACO Force Protection, Annex I.

¹⁷ See also the paragraphs on MILENG and HNS in section IV.

0307. EP is the prevention or mitigation of adverse environmental impacts resulting from military activities.. Environmental considerations include the entire spectrum of environmental media, resources, or programs that may affect, or be affected by, the planning and execution of military activities. Factors that NATO takes into account in its planning include HN laws for environmental compliance, pollution prevention, waste management, conservation, heritage protection (natural and man-made), and protection of flora and fauna. The JFENGR, in coordination with the joint force legal advisor, will advise the JFC on criteria and standards concerning environmental protection based on HN environmental laws, NATO standards or other international conventions as applicable. Environmental impacts may be an inevitable consequence of operations but taking account of applicable environmental considerations in the planning process can minimize these effects without compromising either operational or training requirements. With an understanding of applicable environmental legislation and regulations or other standards, commanders will be able to plan efficiently and act accordingly. By taking proper steps to assess, plan, train and execute the deployment and the mission, the commander will more effectively protect human health and essential environmental resources, reduce the occurrence of environmental accidents, and mitigate any damage that may be caused to the environment, thus limiting NATO's long-term liability.

Section III – Planning at the operational level

0308. JFENGR staff contributes to the Operations Planning Process (OPP) through the planning group at the operational level. It will identify MILENG support requirements, including infrastructure¹⁸, HNS, EP, engineering support to force protection (FP), engineer logistic and resources requirements, existing host nation construction standards and contributes to other functional areas of the HQ by providing subject-matter expertise to their annexes and the OPLAN main body. The staff prepares commander's policy and guidance and develops the MILENG support annex, respective appendices, and develops and maintains plans for the provision of MILENG support¹⁹. The JFENGR staff must coordinate closely with the strategic and tactical levels²⁰ to optimize planning and preparation time. Feedback on concepts, doctrine, organization and the force generation process must be analysed and lessons identified in order to improve the way that NATO operates.

0309. MILENG input to the OPP will be determined by operational requirements. Available time, funding, resources and manpower will be limiting factors given full account

¹⁸ It is also responsible for developing and supporting programs of work, including NSIP-funded projects.

¹⁹ MILENG requirements can also be covered, or partially covered, by HNS, civilian organizations or contractors.

²⁰ Requirements originating at the operational level may require action at the strategic level; conversely, information needed at the strategic level may only be available within the JOA.

when planning for engineer tasks. The MILENG contribution as an integral part of the OPP will be developed through the following steps²¹:

- a. **Phase 1 –Situation awareness.** Until receipt of the warning order from SHAPE, JFENGGR staff will continue routine training and data collection activities. If already aware of imminent changes to the political situation or the start of a new crisis, JFENGGR staff will intensify information collection and start designing a possible infrastructure development plan together with generic funding requirements and conduct parallel planning with higher HQ. MILENG annexes of applicable contingency plans should be scrutinized and updated. Country databases will need to be maintained and should contain as much information as possible on terrain, infrastructure and country specific commercial capabilities in the area of interest. MILENG considerations during this step of planning include, but are not limited to:
- (1) Terrain and related weather analysis in support of operational area / environment visualization.
 - (2) HN infrastructure and resources assessment.
 - (3) Assessment of coalition and HN MILENG capabilities.
 - (4) Assessment of present non-military organizations which provide MILENG-related capabilities, including the support they need and which support they can provide to MILENG.
 - (5) Additional digital mapping and imagery requirements for projected missions.
 - (6) Capabilities of assigned military engineer forces.
 - (7) Adversary military engineer capabilities.
 - (8) Environmentally sensitive areas and other impacts on the environment.
 - (9) Historic and cultural resources.
 - (10) Bed-down requirements and availability of resources for supported friendly force.
 - (11) HN design requirements and legal standards.

²¹ See ACO COPD.

- (12) Lines of Communications (LOC) and Ports of Debarkation (Airport (APOD), Seaport (SPOD) or rail port) supportability.
- b. **Phase 2 – Operational-level appreciation of SACEUR’s Strategic Assessment.** JFENGGR staff will support the planning group at operational level, which leads in the development of the operational-level appreciation of SACEUR’s strategic assessment. The Joint Operations Planning Group (JOPG) is responsible for the analysis and evaluation of the military response options. It provides the JFC with an assessment of the military activities required to accomplish the desired strategic objectives and end-state. MILENG planners analyse these activities and identify how MILENG can support them. The outcome of the analysis will influence the force generation process for MILENG capabilities.
- c. **Phase 3 - Operational Orientation.** JFENGGR staff will maintain close coordination with operations planning staffs and logistic planners as well as NATO and national intelligence collection agencies, in order to design MILENG support options for all possible Courses of Action (COA). They will advise on the most effective and efficient MILENG support for the preferred COA and draft possible MILENG task organizations. Engineers must deploy as part of any operational reconnaissance and liaison deployments or technical survey missions in order to establish in-theatre contacts and gather additional information about terrain, infrastructure and in-theatre military or commercial engineer capabilities.
- d. **Phase 4 A - Operational CONOPS development.** JFENGGR staff will conduct the MILENG portion of the COA analysis and determine the MILENG support required. An infrastructure development plan should be developed for each COA proposed to the JFC. Manning and augmentation requirements will also be taken into account for the implementation of a crisis establishment for JFENGGR staff, as well as troop-to-task analysis for the formulation of the CJSOR. At this point, MILENG planning considers the following:
- (1) Specific MILENG tasks necessary to support each COA.
 - (2) Identify and address any MILENG factors that may influence force deployment and employment such as a surge of MILENG forces for theatre opening.
 - (3) MILENG logistic requirements to support each COA.
 - (4) Construction requirements to support each COA.
 - (5) Force protection.

- (6) Environmental protection.
 - (7) MILENG actions and capabilities plus the resources needed during transition from sustained operations to operation (mission) termination and transition.
- e. **Phase 4 B – Operational-level plan development.** When the decision on a COA is made JFENGR staff will start to develop the MILENG support Annex EE, applicable appendices and the MILENG support paragraph to the main body of the OPLAN, including the priorities for tasks, and assist operations planners in the development of the OPLAN. The infrastructure development plan will be finalized together with the MILENG-related CJSOR. MILENG support contracts will be ready for execution once the OPLAN is approved by the North Atlantic Council (NAC)²².
- f. **Phase 5 – Execution, campaign assessment / OPLAN review.** JFENGR staff will participate in periodic assessments /reviews of existing plans. This will include updates to the infrastructure development plan and commercial capabilities.
- g. **Phase 6 - Transition.** Planning for the disengagement of NATO forces must be initiated well in advance and may involve a large number of non-NATO actors in order to minimize the negative effects that the departure of NATO troops may have on the overall stability of the theatre. The plan includes the coordination of the handover of responsibility (to the United Nations, other international organizations such as European Union or indigenous actors in the crisis area) and redeployment of NATO forces in a controlled manner. JFENGR staff provide input to the development and review of a transition plan and will focus on:
- (1) Dismantling and handover of infrastructure.
 - (2) MILENG support to logistics (e.g., LOC, APOD, SPOD).
 - (3) Clean-up and Remedation.
 - (4) Hazardous areas (e.g., mines, Unexploded Explosive Ordnance (UXO), Explosive Remnants of War)²³.

²² See also the paragraph on support contracts in Section V.

²³ ERW is not NATO terminology – it is defined in the Protocol on Explosive Remnants of War (Geneva Convention on Conventional Weapons, Protocol V) – and used by UN, IO and NGO.

Section IV – Military engineering planning relations to other functional areas and the HN

0310. **MILENG and Geospatial.** Geospatial engineering support encompasses those tasks that provide geographic information and services to enhance awareness, understanding, and effective use of the operational environment for commanders and staff across the full range of operations. In many nations the provision of geospatial engineering support is a MILENG responsibility, while in NATO this support is frequently functionally organized within J2. Operational requirements for geospatial engineering support are determined by the designated chief geographic officer in coordination with the JFENGR and others. This support includes terrain analysis and visualization of the operational environment through the development, management, analysis, dissemination, and display of accurate terrain information and any other geospatially referenced information to facilitate military decision-making. It is the foundation upon which all other information on the operational environment is layered, to form the common operational picture.

- a. Terrain analysis may include, but is not limited to:
 - (1) Assessment of cross-country movement and mobility corridors, incorporating effects of weather and load capacity.
 - (2) Intervisibility and field-of-view analysis for observation posts, covered approaches, sensors and communication.
 - (3) Ingress and egress routes for rotary-wing aircraft and tilt-rotor aircraft.
 - (4) Identification of potential key terrain.
 - (5) Obstacle crossing studies.
 - (6) Resources.
- b. Other geospatial products such as maps and geospatial data are also provided to support movement, manoeuvre, construction and FP.

0311. **MILENG and Targeting.** MILENG input is vital to the targeting process, particularly to help shape and prepare the operational environment for future operations. JFENGR staff will participate in the joint targeting coordination board to provide MILENG advice to the targeting process. This will include:

- a. Selection of targets that serve the operational purpose without constraining future operations such as:
 - (1) Targets that cannot easily be bypassed by the adversary.

- (2) Targets and means of attack, the damage from which can be overcome with own engineering equipment.
 - (3) Infrastructure the loss or damage of which might impact future operations or hinder mission transition; these might be designated as targets to be avoided/protected.
- b. Early appreciation of damage that may raise a requirement for additional equipment, such as bridging, which may have to be acquired from NATO common funds.
 - c. Re-evaluation of engineer advice based on battle damage assessment.
0312. **MILENG and Civil-Military Cooperation (CIMIC).** In a comprehensive approach, appropriate non-military organizations are included in information sharing, planning and execution of an operation as early as possible and when needed. While CIMIC provides the principal interface to such international and non-governmental organizations, HN governmental authorities and agencies and the population, MILENG can provide effective assistance to them through general engineering and infrastructure related efforts (e.g. reconstruction of key infrastructure in the absence of the formally responsible entities) and subject matter advice. CIMIC staff should facilitate the interaction between MILENG and other actors relevant for engineering. The JFC must balance between requirements for MILENG efforts in support of operations and assistance to civil actors. A comprehensive approach may contribute to:
- a. Promote harmonisation of efforts.
 - b. Sharing of general information on the situation, what is required to be done, and what is being planned and executed by other relevant actors.
 - c. Consideration of cost-sharing arrangements, in consultation with other actors.
 - d. Consideration of civilian services to augment the force engineering capability.
0313. **MILENG and HNS.** HNS is civil and military assistance rendered in peace, crisis or war by a HN to NATO and/or other forces and NATO organizations, which are located on, operating on/from, or in transit through the HN's territory²⁴. Although logistics (or appropriate equivalent) is the lead for many aspects of HNS, some HNS capabilities are of direct concern to MILENG. From a MILENG perspective, it is important that liaison with the HN is established at the earliest opportunity.

²⁴ AAP- 6.

0314. HN sovereignty must be respected in the planning and execution of engineering work on its territory. Compliance with HN planning regulations, engineering standards, codes of practice and law will normally be required, as a minimum. Consequently, much MILENG activity may need to be coordinated with, and approved by HN authorities. If there are no HN standards, or these standards are inadequate, the JFENGR is responsible for advising the JFC on the standards for construction, safety and EP to be adopted in the JOA. When requesting HN reviews or input, it must be considered that the quality of the work will often suffer if the effort is rushed. Work must be planned to allow others sufficient time to carry out their tasks. Critical HN engineer resources (material and manpower) need to be identified early in order to allow the JFENGR to coordinate their allocation.
0315. JFENGR plans staff must be aware of the potential and limitations for HNS assets in supporting the overall engineer plan. Key aspects to consider include:
- a. Engineer force capabilities.
 - b. Available resources.
 - c. Construction standards.
 - d. Environmental regulations and guidelines.
 - e. Contractor capabilities and contracting law/procedures.
 - f. Socio-economic concerns.
 - g. Force protection concerns.
0316. **MILENG and Logistics.** A JLSCG (or appropriate equivalent) maintains overall responsibility in the JOA for the movement and sustainment of forces, and coordinates logistic activities with other branches, the HN, troop-contributing nations national support elements, and the component commanders. Logistic activities are supported by a number of specialists, including MILENG. Such support includes the acquisition, restoration, repair, construction, maintenance and disposal of those infrastructure facilities required to mount, deploy, accommodate, sustain, and re-deploy military forces, including the construction, restoration and maintenance of LOC and facilitation of environmental protection.

Section V – Special considerations for military engineering planning

0317. MILENG must be fully integrated into the respective HQ planning processes and there are a number of specific areas in the operational-level planning process on which MILENG must coordinate with other functional staff divisions. On occasion, MILENG must take the lead in accomplishing planning objectives.

- a. **Funding Mechanisms.** The primary funding mechanisms for NATO operations are national funding, multinational funding, joint funding, and common funding. Common funding is provided to NATO by the nations collectively.
 - b. **NATO Security Investment Programme (NSIP).** One type of common funding is the NSIP. To attract common funding, there must be a military requirement, and the required capability must be "affordable" and "eligible" for common funding. Affordability refers to the priority of the requirement in comparison with other requirements. Eligibility refers to what may be procured within the rules of common funding. NSIP common funding eligibility focuses on the provision of infrastructure requirements which are over and above those which could reasonably be expected to be made available from national resources. For each Alliance Operation and Mission (AOM), the NAC normally establishes special funding rules for the operation; the basic principle is that "costs lie where they fall". Common funding is provided for costs that are not attributable to a single nation and these typically include theatre HQ elements, shortfalls in strategic communications, and critical strategic theatre infrastructure²⁵.
 - c. **Military Budget.** The NATO military budget pays for operation and maintenance costs (that are not directly attributable to a nation) during AOM.
 - d. **Funding Requests.** An urgent requirement describes the requirement in terms of the problem to be solved and the effect to be achieved, assesses the resources needed to deliver the solution and addresses the risks associated with 'doing nothing'. For AOM infrastructure, it is a MILENG task to assist in development of the operational requirement, examine options, recommend and define the technical solutions and promote the allocation of funding. Basic procedures for these requests are set out in Bi-SC 85-1 Capability Package Directive (Interim) dated on 11 June 2007. Given the constraints associated with common funding eligibility and approvals, it is critical that the urgent requirement is solidly documented and that the staffing process begins as soon as infrastructure requirements are identified.
0318. **Resource Development Plan (RDP)**²⁶. The RDP provides commanders with an overall view of the resources required to support a particular operation. It incorporates not only infrastructure, as reflected in the infrastructure development plan, but also those support requirements related to Communication and Information Systems (CIS), manpower, operating budgets, etc. MILENG plans staff

²⁵ PO(2013)0056 dated 05 February 2013 provides the basic framework for Funding Policy for Non-Article 5 NATO-Led Operations and Missions.

²⁶ Bi-SC Directive 85-1.

must ensure that these other resource requirements reflect the impacts generated by AOM infrastructure and are included in the RDP.

0319. **Support Contracts.** Experience shows that there are rarely enough military engineers available to execute all engineer tasks. This is particularly true at the theatre level. This shortage may be partially overcome by the use of civilian construction and service contractors. Such contracts may be prearranged as part of routine contingency planning where the execution of the contract is linked with the activation of the plan by the NAC. Coordination must occur between strategic and operational-level MILENG staff, the appropriate component commands and the HN. Quality management²⁷ must be accounted for in task planning and manning levels.
0320. **Theatre Class IV Materiel.** Critical material needed to support theatre-level capabilities will be procured, managed and distributed in close coordination with the JFENGR staff. This materiel might include bridging for theatre main supply routes, force protection stores for theatre HQ and scarce construction materials for theatre APODs or fuel depots. These materials will either have to be purchased, transferred from another JOA, or released from operational / strategic reserve stocks. It is a MILENG task to identify JOA engineer materiel requirements, establish the appropriate controls and coordinate these measures with the respective component, joint logistic staff and strategic command / joint force HQ staff.
0321. **Employment of MILENG Personnel.** There will be a constant requirement to ensure concentration of MILENG capability on the main effort. Supporting components must be prepared to provide MILENG support to other components as directed by the JFC. Advising the JFC on such manning requirements and possibilities is a key role for the JFENGR
0322. **Contracting.** For NSIP funded projects, contracting authority is delegated by the NATO Investment Committee. For AOM, this authority is typically delegated to SHAPE (minor capital projects), NATO Support Agency (NSPA) (major capital projects) and NATO Communication and Information Agency (CIS projects). As a result, JFENGR staff will require a collocated contracting organization to support delivery of SHAPE-delegated NSIP projects as well as procurement of engineer services and materiel funded through the NATO military budget. For major capital projects contracted directly by the NATO agencies, JFENGR staff will be expected to support the agencies through provision of military advice regarding operational requirements, support to design reviews, input regarding contract evaluation criteria and technical assessment of contractor proposals.

²⁷ International Organization for Standardization (ISO) 9000.

Section VI - Summary

0323. MILENG input is essential to the operations planning process at all levels. The MILENG staff must coordinate not only horizontally across the staff divisions of their parent HQs but also vertically to the MILENG staff of superior and subordinate HQs as well as outwards to the HN, IOs, non-governmental organizations, and other relevant actors in accordance with MC 133/4.

CHAPTER 4 - ENGINEER SUPPORT TO THE CONDUCT OF ALLIED JOINT OPERATIONS

Section I - Introduction

0401. This chapter explains the Military Engineering (MILENG) contribution to all components in the preparation and execution of Allied joint operations, based on the operational principles as outlined in chapter 2. It describes the execution of MILENG support to a joint force throughout the full range of potential NATO operations.

Section II – Military engineering support during all stages of allied joint operations²⁸

0402. **Intelligence preparation of the operational environment and operations planning.** This has already been described in earlier chapters.

0403. **Preparation of the force, including (logistic) build-up.** Based on the estimate, engineer forces are generated from troop-contributing nations to fulfil the approved CJSOR. Agreements with the Host Nation (HN) on status of forces and provision of materiel, manpower and services are concluded. Contracts for provision of materiel and services from both outside the theatre and from indigenous HN contractors are put in place to cover any remaining gaps. If necessary, staging bases outside the theatre are constructed to support the Reception, Staging and Onward Movement (RSOM) process.

0404. **Deployment.** Early in the deployment stage the main effort of MILENG support is to upgrade and maintain theatre infrastructure, in particular logistic facilities and installations to continue the RSOM process. Sufficient MILENG support is essential to the deployment process and often a greater engineer effort will be needed than for some other stages, sometimes necessitating a surge of engineer forces. The HN may provide all or some of this support where capable. MILENG support will include but is not limited to:

- a. Assessing and recommending the most efficient use of existing infrastructure.
- b. Any necessary (re)construction and maintenance of airports, seaports or rail ports.
- c. Development, preparation, reinforcement and maintenance of all routes, areas and installations, including the disposal of explosives, which must be

²⁸ See AJP-03(B) Section XI for details on Stages of an Operation.

used by the force during reception, staging and onward movement, and later as land lines of communication.

d. MILENG support to force protection measures.

e. Environmental impact assessments and environmental baseline studies²⁹.

0405. **Execution of Operations.** Operations are carried out by tactical commanders in accordance with the campaign plan. Following the deployment phase the MILENG main effort is likely to be mobility, counter mobility and survivability support. Engineers will support sustainment of the force by mobility support, developing infrastructure and improving force protection. Effort may also be shifted to stabilization and reconstruction if needed to advance the campaign.

0406. **Operation (mission) termination and transition.** Execution of a mission will include a termination and transition stage before redeployment³⁰. MILENG support typically includes infrastructure repair, environmental remediation, liaison with Non-Governmental Organizations (NGO), International Organizations (IO), national authorities or other organizations, and possibly even support to displaced persons and refugees. In its interaction with non-NATO actors, NATO will continue to act in accordance with the implementation of The Comprehensive Approach Action Plan³¹. A comprehensive record of all MILENG-related activities must be handed over. There is increased risk that the mission parameters will begin to expand in this stage. The JFENG staff must ensure that close coordination is maintained with CIMIC and financial control staff, and that NATO resources are used only in tasks supporting the NATO mission and within relevant eligibility criteria.

0407. **Redeployment of the force.** When the redeployment takes place in a secure environment, Joint Force Engineer (JFENG) staff must plan to dismantle or hand over redundant NATO infrastructure at an early stage. When the redeployment takes place in a hostile environment JFENG staff must be prepared to support manoeuvre and movement until the very end of the campaign. JFENG staff must also be prepared to support force protection during redeployment when large numbers of personnel and equipment will gather in the points of embarkation.

0408. **Operation/campaign assessment – doctrine evaluation and lessons learned.** Quality control of the way military forces operate is difficult to achieve but one of the most reliable measures must be their performance during operations. The identification of lessons for a multinational force can be difficult when some lessons

²⁹ An environmental impact assessment is both a policy and management tool. An environmental impact assessment assists to identify, predict and evaluate the foreseeable environmental consequence of a proposed activity. See also MC 469/1.

³⁰ See also Chapter III, paragraph 310 g.

³¹ C-M (2008) 0029 (COR 1), Proposal On a Way Ahead on Comprehensive Approach, 02 April 2008.

will be a national responsibility and others will be for the Alliance to address. Commanders must recognize from the outset that provision must be made for monitoring and recording force performance in all its aspects for subsequent analysis and critical review. The purpose is to learn efficiently from experience and to provide validated justifications for amending doctrine and the existing way of doing things, in order to improve performance, both during the course of an operation and for subsequent operations.

Section III – Military engineering support to air operations

0409. **General.** MILENG support to air operations includes assessing, restoring, maintaining, and, if necessary, constructing or installing mission-related airfield infrastructure in order to ensure air operations and maximize survivability and sustainment of air assets. Damage to mission-critical airfield installations could lead to closure of the airfield and reduction of airpower availability to the joint force commander. Airfield engineering capabilities are scarce resources and can become mission-critical assets.
0410. **Planning and execution.** In addition to the MILENG factors considered for support to land operations, MILENG support to air operations will include restoration of minimum operating surfaces, including aircraft manoeuvring areas and access tracks, as well as facilities for conducting air operations.

Section IV – Military engineering support to maritime operations

0411. **General.** MILENG support to maritime operations is to monitor, maintain, restore, and if necessary provide mission related maritime infrastructure in order to maximize maritime operations, survivability and sustainment of maritime installations and forces. Unforeseen damages at mission critical maritime installations could ultimately lead to closure of the Seaport of Debarkation (SPOD), which then would lead to reduction of capability to the Joint Force Commander (JFC). The chief engineer within allied maritime command HQ is the principal advisor to the commander in all aspects of MILENG, not limited to infrastructure; this may include shifting the main effort of MILENG support to, or from, maritime operations.
0412. **Planning and execution.** MILENG expertise is required to establish and/or maintain maritime operational capability. MILENG support to maritime operations includes early identification of potential SPOD; reconnaissance, information gathering, analysis and assessment as well as definition of force requirements, analysis and assessment of capabilities, capacities and shortfalls as well as plan and initiate necessary mitigation measures; restoration of minimum port facilities, including improving beaches and port facilities to increase cargo and personnel throughput; shore stabilization, site grading, drainage, facility construction and

improvements at SPODs; environmental damage mitigation; and utility installation. Tasks will be processed in accordance with national and NATO procedures.

Section V – Military Engineering support to special operations

0413. **General.** Special Operations Forces (SOF) operating under NATO will normally conduct operations in a Joint Operations Area (JOA) with other air, land and maritime forces. Above and beyond organic assets and Combat Service Support (CSS) elements, SOF may occasionally require support from specialists due to the scope of the tasks related to their mission
0414. **Planning and execution.** There are some crucial phases of a special operation for which MILENG support may be required, for example during insertion/extraction, when the integral capabilities are not sufficient (but could also be required for other specific parts of a SOF mission). Normally MILENG specialists will be assigned to non-conventional groupings under specific command relationships. The potential of engaging MILENG in a special operation should be considered from the very early stages of planning by dispatching proper liaison elements as required to all necessary levels (JFHQ, components etc.).

Section VI – Military engineering support to logistic operations

0415. **General.** The assured availability of mission-related logistics infrastructure is likely to be vital to movement, manoeuvre and sustainment of an operation. The aim of MILENG support to logistics is to monitor, maintain, restore, and if necessary provide this infrastructure, mostly associated with RSOM and sustaining the joint force. Particular areas of expertise are infrastructure development, mobility support and Environmental Protection (EP).
0416. **Planning and execution.** The JFENGR and staff is the focal point for the planning and execution of all aspects of MILENG support to logistics within the assigned JOA. Chief engineers of the subordinated commands are responsible for the prioritization and coordination of the MILENG support within their AOR. The JFENGR staff will be engaged closely with the appropriate HN authorities, other organizations and civilian contractors as these can be considered as an additional source for capabilities to support the joint force. This may include offering support to those entities, advice and information, including on NATO's requirements. At any given stage of an operation the JFC may shift the main effort of MILENG support to logistics, and may allocate capabilities normally seen supporting manoeuvre to infrastructure development and sustainment, enhancement of freedom of movement or the provision of real life support.
0417. **Joint Logistic Support Group (JLSG).** The JLSG HQ is responsible for providing theatre level multinational support.

- a. One of the primary tasks of the MILENG element of the JLSG is to plan/prioritise and coordinate military engineering support for theatre logistics.
- b. Military engineers within the JLSG will cover the functional areas of MILENG current operations, plans, infrastructure resources (to include real property), EP and management and Explosive Ordnance Disposal (EOD), in order to provide advice on all MILENG-related matters to facilitate the process of RSOM, the sustainment and the redeployment of all forces. The MILENG staff of the JLSG, with its mission-tailored assigned force package, will mainly focus on supporting the improvement of infrastructure prerequisites of the marshalling and staging areas and the maintenance of the lines of communication. When a JLSG is not established as part of the joint force, the JFENGR will be responsible for providing these functions and capabilities.

Section VII – Specific considerations for operations

0418. **Explosive Ordnance Disposal (EOD)**³². Only qualified trained³³ personnel are authorized to conduct disposal of unexploded explosive ordnance or abandoned munitions. Specially trained military engineers can be employed to assist EOD elements with the disposal of large quantities of munitions in order to reduce the significant threat to friendly forces and the local civilian population. Engineer units, HNS and specialized agencies must work together to mitigate the risk but upon redeployment of the NATO force, the ultimate responsibility for Explosive Remnants of War (ERW) clearance and management of munitions caches will lie with the HN. The affiliation of EOD to MILENG varies within NATO nations; therefore the command status of all EOD forces participating in an operation will be clearly defined both in operations orders and within national and international directives.
0419. **Military Search.** Military search is an all-arms responsibility, though military engineers will be trained as specialists and have responsibility for advanced search, as well as carrying out basic and intermediate search operations as part of their normal military function³⁴. Engineers can also assist in determining whether it is safe for search operations to be conducted in or near damaged structures or close to other hazards and, where appropriate, design and build protective works to safeguard search operations.
0420. **Countering-Improvised Explosive Devices (C-IED).** C-IED is an all-arms responsibility and includes attacking the networks, defeating the device and preparing the force. Military engineers, due to their training in military search, or in specialist roles such as EOD and geospatial engineering, may be involved in C-IED

³² See also para 0213 c.

³³ See STANAG 2389 Minimum Standards of Proficiency for trained explosive ordnance disposal personnel.

³⁴ ATP-73 Vol. 1.

operations to "defeat the device"³⁵. MILENG support may include engineering advice, protective works, and the destruction of explosives as described above. Specially trained MILENG and EOD operators will also contribute to "attacking the network"³⁶ by exploiting improvised explosive device finds to contribute to the intelligence cycle and informing targeting decisions.

0421. **Route Clearance.** MILENG resources are responsible for investigation, detection, identification, marking, neutralization and reporting of mines and explosive ordnance, supported by attached EOD elements.
0422. **Training.** MILENG may be required to contribute to multinational training of joint force units, NGO and IO personnel, local population, local security forces and if necessary, former warring factions. JFENGR staff must be prepared to coordinate training conducted by MILENG units, which may include awareness training for explosive threats.
0423. **Deception.** MILENG units and activities are a valuable combat indicator for the opposing force intelligence effort and can therefore play a key role in enhancing the credibility of a feint or deception plan. Once preparation for a specific operation is underway, MILENG may also contribute by construction of dummy infrastructure, simulation of damage and manufacture of dummy equipment.
0424. **Infrastructure.** MILENG will support and coordinate the project management and execution of all infrastructure projects in accordance with the infrastructure development plan.
0425. **Force Protection (FP) Works.** MILENG contributes to the overall FP effort by providing advice on appropriate physical protective measures, including obstacles, observation points, warning / detection systems, camouflage, and mitigation of weapons effects on structures as well as protective measures required to mitigate the effect caused by nature such as hurricanes, tornados, floods, earthquakes, etc.
0426. **Environmental Protection (EP)**³⁷. EP is an all arms activity, led by military engineers, and is defined as the prevention or mitigation of adverse environmental impacts resulting from military activities. The impact of operations, including all military engineering, on the environment must be anticipated and assessed prior to operations. Environmental considerations must then be integrated into operation plans in order to prevent or mitigate the potential environmental impacts.

Section VIII – Summary

³⁵ See AJP-3.15.

³⁶ See AJP-3.15.

³⁷ See MC 469/1 and STANAG 7141 for details.

0427. Engineer support to the joint force is essential to the conduct of all stages of a NATO operation. MILENG subject matter expertise and advice is required at HQs of all levels from the earliest stages of the operation as engineer issues are likely to significantly influence the commander's options. Initially the focus of engineer effort is on operational infrastructure but during the operation this is likely to switch to manoeuvre support. Engineer expertise and advice must be provided in a number of specialist areas to achieve the full range of mission objectives.

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LEXICON

PART I – ACRONYMS AND ABBREVIATIONS

AAP	Allied administrative publication
ACO	Allied Command Operations
AJP	Allied joint publication
AOM	Alliance operations and missions
AOR	area of responsibility
APOD	airport of debarkation
Bi-SC	of the two Strategic Commands
CC	component command
C-IED	countering-improvised explosive device
CIMIC	civil-military cooperation
CIS	communication and information systems
CJEODC	combined joint explosive ordnance disposal cell
CJSOR	combined joint statement of requirements
COA	course of action
CONOPS	concept of operations
CSS	combat service support
C2	command and control
EOD	explosive ordnance disposal
EP	environmental protection
ERW	explosive remnants of war
FP	force protection
HN	host nation
HNS	host-nation support
HQ	headquarters
IO	international organization
JFC	joint force commander
JFENGR	joint force engineer
JLSG	joint logistic support group
JOA	joint operations area
JOPG	joint Operations Planning Group
LOC	lines of communications
MC	Military Committee
MILENG	military engineering
NAC	North Atlantic Council

NATO	North Atlantic Treaty Organization
NCS	NATO command structure
NFS	NATO force structure
NGO	non-governmental organization
NSPA	NATO Support Agency
NSIP	NATO Security Investment Programme
OPCON	operational control
OPLAN	operation plan
OPP	operations planning process
PCM	partnership cooperation menu
RDP	resources development plan (Bi-SC Directive 85-1)
RSOM	reception, staging and onward movement
SC	strategic command(er)
SOCC	special operations component command
SOF	special operations force
SPOD	sea port of debarkation
S&R	stabilization and reconstruction
UXO	unexploded explosive ordnance

PART II – TERMS AND DEFINITIONS

allied joint publication

An Allied publication containing doctrine applicable to NATO and NATO-led operations involving more than one service. (NTMS – NATO Agreed)

civil-military cooperation

The coordination and cooperation, in support of the mission, between the NATO Commander and civil actors, including the national population and local authorities, as well as international, national and non-governmental organizations and agencies. (NTMS – NATO Agreed)

Countering-improvised explosive device

The collective efforts at all levels to defeat the improvised explosive device system through attack the networks, defeat the device and prepare the force. (NTMS – NATO Agreed)

doctrine

Fundamental principles by which the military forces guide their actions in support of objectives. It is authoritative but requires judgement in application. (NTMS – NATO Agreed)

environment

The surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelations. (NTMS – NATO Agreed)

environmental protection

The prevention or mitigation of adverse environmental impacts (NTMS – NATO Agreed)

explosive remnants of war

Explosive remnants of war means unexploded ordnance and abandoned explosive ordnance. (Protocol on explosive remnants of war (Geneva Convention on Conventional Weapons, Protocol V) - not NATO terminology, it is used by UN, IO and NGO)

explosive ordnance disposal

The detection, identification, on-site evaluation, rendering safe, recovery and final disposal of unexploded explosives ordnance. (NTMS – NATO Agreed)

force protection

All measures and means to minimize the vulnerability of personnel, facilities, equipment and operations to any threat and in all situations, to preserve freedom of action and the operational effectiveness of the force. (NTMS – NATO Agreed)

host nation

A nation which, by agreement:

- a. receives forces and materiel of NATO or other nations operating on/from or transiting through its territory;
 - b. allows materiel and/or NATO organizations to be located on its territory; and/or
 - c. provides support for these purposes.
- (NTMS – NATO Agreed)

host-nation support

Civil and military assistance rendered in peace, crisis, or war by a host nation to NATO and/or other forces and NATO organizations which are located on, operating on/from, or in transit through the host nation's territory. (NTMS – NATO Agreed)

infrastructure

In NATO, the static buildings, facilities and other permanent installations required to support military capabilities. (NTMS – NATO Agreed)

international organization

An intergovernmental, regional or global organization governed by international law and established by a group of states, with international juridical personality given by international agreement, however characterized, creating enforceable rights and obligations for the purpose of fulfilling a given function and pursuing common aims.

Note: Exceptionally, the International Committee of the Red Cross, although a non-governmental organization formed under the Swiss Civil Code, is mandated by the international community of states and is founded on international law, specifically the Geneva Conventions, has an international legal personality or status on its own, and enjoys some immunities and privileges for the fulfilment of its humanitarian mandate. (NTMS – NATO Agreed)

joint force engineer

The principal advisor to a joint force commander on all military engineering issues. (NTMS – NATO Agreed)

military engineering

Engineer activity, undertaken regardless of component or service to shape the physical operating environment. (NTMS – NATO Agreed)

non-governmental organization

A private, not for profit, voluntary organization with no governmental or intergovernmental affiliation, established for the purpose of fulfilling a range of activities, in particular development-related projects or the promotion of a specific cause, and organized at local, national, regional or international level.

Notes:

1. A non-governmental organization does not necessarily have an official status or mandate for its existence or activities.

2. NATO may or may not support or cooperate with a given non-governmental organization.

(NTMS – NATO Agreed)

operation

A military action or the carrying out of a strategic, tactical, service, training, or administrative military mission; the process of carrying on combat, including movement, supply, attack, defence and manoeuvres needed to gain the objectives of any battle or campaign. (NTMS – NATO Agreed)

operational level

The level at which campaigns and major operations are planned, conducted and sustained to accomplish strategic objectives within theatres or areas of operations. (NTMS – NATO Agreed)

reconnaissance

A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy, or to secure data concerning the meteorological, hydrographical or geographic characteristics of a particular area. (NTMS – NATO Agreed)

strategic level

The level at which a nation or group of nations determines national or multinational security objectives and deploys national, including military, resources to achieve them. (NTMS – NATO Agreed)

tactical level

The level at which activities, battles and engagements are planned and executed to accomplish military objectives assigned to tactical formations and units. (NTMS – NATO Agreed)

unexploded explosive ordnance

Explosive ordnance which has been primed, fused, armed or otherwise prepared for action, and which has been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installations, personnel or material and remains unexploded either by malfunction or design or for any other cause. (NTMS – NATO Agreed)

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REFERENCE PUBLICATIONS

MC 133/4	NATO's Operation Planning
MC 319/2	NATO Principles and Policies for Logistics
MC 324/3	The NATO Military Command Structure
MC 327/2	NATO Military Policy for Non-Article 5 Crisis Response Operations
MC 411/1	NATO Military Policy on Civil-Military Cooperation (CIMIC)
MC 469/1	NATO Military Principles and Policies for Environmental Protection
MC 536	NATO Policy for Infrastructure Engineering for Logistics
MC 560/1	MC Policy for Military Engineering
MC 586/1	MC Policy for Allied Forces and their use for Operations
AJP-01	Allied Joint Doctrine
AJP-3	Allied Joint Doctrine for the Conduct of Operations
AJP-3.2	Allied Joint Doctrine for Land Operations
AJP-3.4.1	Allied Joint Doctrine for Peace Support Operations
AJP-3.4.4.	Allied Joint Doctrine for Counter Insurgency
AJP-3.4.9(RD)	Allied Joint Doctrine for Civil-Military Cooperation
AJP-3.9	Allied Doctrine for Joint Targeting
AJP-3.13	Allied Joint Doctrine for the Deployment of Forces
AJP-3.14	Allied Joint Doctrine for Force Protection
AJP-3.15	Allied Joint Doctrine for Countering – Improvised Explosive Devices
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AJP-4.6(B)(SD)	Allied Joint Doctrine for the Joint Logistic Support Group
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AAP-6 (2012)	NATO Glossary of Terms and Definitions
AAP-15(2012)	NATO Glossary of Abbreviations Used in NATO Documents and Publications
STANAG 7141	Joint NATO Doctrine for Environmental Protection During NATO Led Military Activities
C-M (2008) 0029 (COR 1),	Proposal On a Way Ahead on Comprehensive Approach
Bi-SC 85-1	Capability Package Directive (Interim)
ACO Directive 80-25	ACO Force Protection
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