United Nations
Peacekeeping Missions
Military Engineer Unit Manual

3rd Edition
2024

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Foreword

I am honored to present this revised manual, a testament to the unwavering commitment and collaborative efforts of all those who contributed to its development. This comprehensive guide stands as a crucial resource, reflecting the collective wisdom and expertise that underpin our peacekeeping missions.

The indispensable role of Military Engineers in United Nations peacekeeping operations cannot be overstated. These dedicated professionals are the backbone of our missions, enabling our troops to maneuver effectively within their areas of operation. Their efforts extend far beyond the construction of physical infrastructure; they are pivotal in ensuring the safety and security of both peacekeepers and the local populations they serve.

Military Engineers build and maintain the essential facilities that support our peacekeeping efforts, from roads and bridges to command centers and shelters. Their work facilitates the movement and operational effectiveness of our troops, allowing them to respond swiftly and efficiently to emerging challenges. Moreover, the infrastructure they develop is vital for the protection of peacekeepers and the local communities, creating secure environments where peace can take root and flourish.

This manual is a testament to the vital contributions of our Military Engineers. It encapsulates best practices, innovative strategies, and lessons learned from the field, serving as a valuable tool for enhancing our operations. I extend my deepest gratitude to all who have worked tirelessly to bring this revised manual to fruition. Your dedication and expertise ensure that we continue to uphold the highest standards of peacekeeping, fostering stability and hope in regions beset by conflict.

As we move forward, let us reaffirm our commitment to the principles of peace and cooperation that define our mission. Together, we will continue to build a foundation for lasting peace, driven by the unwavering spirit and resilience of our Military Engineers.

Jean-Pierre Lacroix
Under-Secretary-General
for Peace Operations

Preface

It is with immense pride and gratitude that I present this revised manual, an essential resource developed through the collective efforts and dedication of numerous professionals. This manual is a cornerstone for our operations, ensuring that we remain equipped to face the evolving challenges in our peacekeeping missions.

Military Engineers play an indispensable role in United Nations peacekeeping operations. They are the enablers, ensuring that our troops can maneuver effectively within their areas of operation. Their work goes far beyond mere construction; they are instrumental in creating safe and secure environments for both peacekeepers and the local populations.

In these times of climate change, which increasingly hampers the freedom of movement for peacekeepers, the role of Military Engineers becomes even more critical. Extreme weather conditions, environmental degradation, and natural disasters present significant obstacles that our missions must navigate. This makes the review and update of this manual especially timely and necessary. It ensures that our peacekeeping missions are not only prepared to address these challenges but are also contributing to the United Nations Sustainable Development Goals (SDGs). By deploying and constructing responsibly within host countries, we support sustainable development, helping to build resilience and promote stability.

This manual encapsulates best practices, innovative strategies, and the wealth of experience gathered from the field. It serves as a vital tool for enhancing our operations, ensuring that our Military Engineers can continue their crucial work effectively. I extend my deepest appreciation to all who have contributed to the development of this manual. Your commitment and expertise are vital to the success of our peacekeeping missions.

As we look to the future, let us reaffirm our dedication to the principles of peace, sustainability, and cooperation that define our mission. Together, we will continue to build a foundation for lasting peace, driven by the resilience and ingenuity of our Military Engineers.

Major General Cheryl Pearce
Acting Military Advisor
Office of Military Affairs
Department of Peace Operations

Members of the Hybrid UN Military Engineer Unit Manual Workshop
Virtual / New York, United States of America, September 2024.

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56	Lieutenant Colonel	Benjamin	HOWARD	UNMAS
57	Lieutenant Colonel	Shuaitao	SUN	UNMISS / China
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Purpose and Rationale

The UN Peacekeeping Mission Military Engineer Unit Manual serves as a comprehensive resource intended to aid Troop Contributing Countries (TCCs) in equipping their contingents for deployment to United Nations Peacekeeping missions.

The manual explains the different capacities of Military Engineers (MILENGs), ranging from Combat Engineers to Construction Engineers, including Explosive Ordnance Disposal (EOD) and Search Teams up to Composite Military Engineer Units, and explains the specific requirements of the UN, to enable dedicated planning and employment of the various capabilities and functions in support of a UN Mission1.

The handbook does not address any military Tactics, Techniques and Procedures (TTPs). These remain the prerogative of individual Member States. For TCCs nominating Military Engineer units, it is a requirement to adhere to the competencies stated in this manual.

Scope

This Manual is primarily written at the operational and tactical levels. It is based on UN guidance reflecting lessons learned, feedback from field Missions and input from peacekeeping practitioners experienced in MILENG Unit peacekeeping operations.

It serves as a reference for TCCs, commanders and their staff in the planning and deployment of Military Engineers and the coordination of all tasks. It complements the UN Improvised Explosive Device (IED) Threat Mitigation Handbook and the UN Explosive Ordnance Disposal (EOD) Unit Manual in terms of the employment of search procedures to detect explosive ordnance (EO).

This Manual also serves as a reference for UN planners developing the Statement of Unit Requirement that, together with the Memorandum of Understanding (MOU) between the UN and a TCC, will form the basis for a MILENG Unit deployment.

History

This Handbook replaces the second edition of the United Nations Peacekeeping Missions Military Engineer Unit & CET Search and Detect Manual (January 2020).

References

The manual should be read in conjunction with relevant UN policies and other UN Manuals, especially the UN Strategy for Counter-IEDs, the UN IED Threat Mitigation Handbook, the UN Peacekeeping Mission Military Engineer Manual, and the UN Infantry Battalion Manual (UNIBAM) and the DOS Engineering Support Manual. This will provide a more comprehensive understanding of UN standards, policies and procedures related to MILENGs in support of peacekeeping operations.

[1] Throughout this document, a capital M in the word “Mission,” as in, “the UN Mission,” is used to distinguish the word as a UN organization; as opposed to a small “m,” as in, “a military mission” indicating a task or operation.

All United Nations guidance documents, referenced int the IED TM Handbook are available for personnel inside the UN system at the

- **Policy and Practice Database**
  https://unitednations.sharepoint.com/sites/PPDB
- **Knowledge Gateway**
  https://unitednations.sharepoint.com/sites/APP-Gateway

  The Knowledge Gateway is the main reference for all guidance documents related to construction/civilian engineering.

And publicly available at the

- **Peacekeeping Resource Hub**

  https://peacekeepingresourcehub.un.org

No reference number of the documents are provided in the document to encourage the reader always to consult the above-mentioned websites to consult the most recent version of the respective documents.

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1. Employment Concept for the Military Engineer Units

Terrain, both natural and manufactured, plays an essential part in Peace operations. The knowledge of its characteristics and the possibility to use it is a key aspect of successful operations. The superior ability to shape the physical environment can significantly contribute to one's own advantage or to the disadvantage of an adversary. To use the physical environment requires inherent capability to preserve or adapt the terrain for peacekeeping purposes under all conditions. It requires understanding and knowledge about the physical environment and how it impacts operations and requires specialized knowledge on how to shape the physical environment for own purposes. This capability within the United Nations (UN) is functionally organized and described as "engineering", to which civil and MILENGs contribute. For civilian engineers, the **Engineer Support Manual** of the Department of Operational Support is the main reference[2]. The manual is the main reference as well for construction engineers, as they are employed to support civilian engineers and contains all the essential regulations for the performance of the respective tasks.

1.1. Role and Responsibilities

MILENG is a pivotal function in support of peacekeeping operations to shape the physical operating environment to effectively deliver the given UN Mission mandate. The MILENG function exists at all levels of command, in any mission, or operation, and in all phases and is coordinated by a MILENG staff.

MILENG supports the implementation of the mission mandate through contributing by the three pillars of the MILENG function:

- Enabling or preventing maneuver or mobility: **Mobility & Counter-mobility support**
- Supporting the survivability and sustainability of forces: **Survivability support.**
- Developing, maintaining, and improving infrastructure: **General engineering support.**

Mobility support will enable and maintain freedom of movement (FOM) and maneuver of own forces and friendly actors, while Counter-mobility support will assist in stopping or disrupting an adversary's FOM and maneuver through the emplacement of manufactured obstacles or enhancement of natural obstacles by manipulation the operating environment (terrain, situation, etc.).

Survivability support will facilitate life support and contribute to Force Protection (FP). It includes aspects of physically protecting personnel, weapons, and materiel from the effects of weapons, detection systems, and from environmental conditions.

General engineering support provides technical and construction expertise to sustain own forces.

[2] See: Engineer Support Manual, Department of Operational Support

Tactical effects are achieved through activities executed at tactical level within one or more of the five areas of expertise of MILENG:

- engineering,
- explosives ordnance disposal (EOD),
- environmental protection (EP),
- military search and
- management of infrastructure.

The activities range thereby from advising, executing, supervising, and organizing to overseeing and the ability to integrate MILENG capabilities into peacekeeping operations across the mission. The support spans the entire mission lifecycle, from initial deployment to final withdrawal, ensuring mission objectives are met with precision and safety.

As a core component of the mission's integrated strategy, the MILENG Unit enhances the operating environment for mission forces, guaranteeing freedom of movement and establishing essential facilities for a safe and secure environment. On the other hand, MILENG also makes a significant contribution to the engagement with the local population by contributing to the protection of civilians and capacity building of host nations (HN).

MILENGs are typically divided into two primary categories: **Combat Engineers** and **Construction Engineers**, which could be further task organized to assemble personnel, skills, and equipment necessary for the efficient completion of assigned tasks. This meticulous organization allows for the optimal utilization of resources and capabilities, thereby enhancing the effectiveness and precision of operations.

Combat Engineers are essential for ensuring mobility through difficult terrain, which enables other UN mission elements to carry out their tasks without hindrance. They work on tasks such as clearing obstacles, building bridges, and creating safe pathways in challenging environments. Construction Engineers, on the other hand, provide mission forces with vital facilities ranging from temporary operating bases to fully equipped field camps. These facilities include infrastructure necessary for the employment of land, air, and maritime assets, ensuring that mission forces are well-supported and can operate effectively.

In addition to Combat Engineers and Construction Engineers, MILENGs usually possess a variety of specialized capabilities, including **Explosive Ordnance Disposal (EOD)** and demining. Their advanced **Search Capabilities** surpass those of other units, significantly enhancing efforts to detect and neutralize explosive threats. They are equipped with specialized road clearance packages, ensuring safe and secure passage through potentially hazardous areas. Furthermore, they can deploy **Special-Purpose Engineers** units with capabilities such as ferries or other connectors, enabling the crossing of waterways, or aviation infrastructure maintenance. These multifaceted skills allow MILENGs to adapt to a wide range of mission requirements, providing critical support in diverse operational environments.

Engineer Units can be composed solely of Combat Engineers, Construction Engineers, a combination of both, including specialized capabilities such as EOD and Search, depending on the specific requirements of the mission. MILENGs are assembled based on the specific situation and task at hand, forming what is known as **Composite Engineer** unit.

This versatility enables MILENGs to adapt and respond effectively to the varied and evolving challenges encountered in UN missions.

MILENGs also play a crucial role in **support to mission partners** and regarding the relationships with the local population through civil-military cooperation efforts. They support e.g., the construction of essential infrastructure, such as roads and wells, which directly benefits the community.

Most of the efforts contribute directly or indirectly to the mandate for the protection of civilians, by e.g., providing accommodation and shelter.

The multifaceted roles and responsibilities of MILENG support own forces in executing the mandate and mission partners and thus enhance the immediate operational effectiveness of the mission. These efforts collectively also contribute to the long-term capacity building of the host nation, ultimately fostering greater stability and security within the country.

1.2. Employment during various Mission Phases

During the Mission start-up phase, MILENGs have a variety of requirements involving planning, design, land development, base camp construction and the provision of basic infrastructure and facilities. These tasks may be performed under challenging security conditions including asymmetric threats and the presence of mines, IEDs and other EO[3] that require removal or destruction.

Combat Engineers provide the Force a unique military capability to perform under these circumstances, complementing other Force and Mission requirements undertaken by the Engineer Unit's Construction Engineers. Together, both types of Engineers provide a vital means to achieve the Force and Mission's initial operating capability as quickly as possible.

During the mandate implementation phase, MILENGs continue to provide the Force with its Combat Engineer support in addition to general Construction Engineer support. Peace Operations experience indicates increasing expectations that UN Military Components will continue to be targeted by negative elements and asymmetric threats that require Combat Engineer capability to enhance survivability.

While the tasks of Combat Engineers predominantly stem from operational exigencies, such as ensuring freedom of movement to enable other forces to fulfill their mandates, potentially expanding patrols within the area, establishing temporary operating bases (TOBs), etc., Construction Engineers typically encounter a more predictable workload.

As they work very closely with the mission's civilian engineers, most tasks are regulated by the Department of Operational Support (DOS) Engineering Support Manual for Field Missions[4] and other relevant guidance documents[5]

[3] All munitions containing explosives, nuclear fission or fusion materials and biological and chemical agents. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket, and small arms ammunition; all mines, torpedoes, and depth charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature. UN Peacekeeping Missions Military EOD Unit Manual (Sep 2017) "Annex I Glossary of Terms".

[4] See: DOS: Engineering Support Manual for Field Missions

[5] See: Guideline on Governance of Major Construction Projects in Field Missions

Missions are encouraged to devise long-term plans that encompass projects spanning the next six to twelve months or even longer, as per the mandate of the mission. This strategic foresight not only facilitates the procurement of essential construction materials but also allows the unit to adequately prepare for the anticipated taskings prior to deployment, thereby organizing the composition of personnel and equipment, including vehicles and machinery, accordingly.

During deployment, military engineers actively participate in numerous working groups and boards, with one of the most critical being the Force Protection Working Group. This group addresses essential planning related to survivability and implements pertinent recommendations. A comprehensive overview of existing working groups and boards can serve as a valuable guide to identify additional committees in which MILENG should be involved, particularly in the absence of explicit regulations.

Finally, during the Mission's transition/liquidation phase, MILENGs (both Combat and Construction) facilitate peace building support goals through the continuance or completion of engineering projects through handover and withdrawal from the Mission area/Area of operation (MA/AO).

Usually, MILENG do not remain deployed until the mission is closed, except for EOD, which accompanies security forces (usually infantry) until the mission closure to support with the mitigation of any explosive threat.

However, especially towards the end of a mission, MILENGs may face additional tasks to perform as camps are gradually closed and the mission contingent centralizes on installation, such as e.g., create new assembly areas for vehicles, dismantling of, removal of contaminated soil, etc. This is done in close coordination and cooperation with Civilian engineers.

1.3. Environmental Considerations related to Military Engineering

Environmental Protection (EP) is an all arms responsibility, led by Commanders and supported by MILENG, to prevent or mitigate adverse environmental impacts.[6] The impact of operations on the environment must be anticipated and assessed prior to operations. Environmental considerations must be integrated into operation plans to prevent or mitigate potential environmental impacts. Factors that UN considers in its planning include Host Nation (HN) and applicable international law for EP, environmental compliance, pollution prevention, waste management, conservation of natural resources, heritage protection (natural and manufactured), and protection of flora, fauna, and biodiversity.

By taking appropriate steps to assess, plan, refine and execute the deployment and the mission, commands at the operational level 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 UN's long-term liability. EP is not simply about limiting financial liability, it can contribute to mission success by enhancing HN relationships, helping to establish credibility, gain support from the local population, while preventing exposure of peacekeepers and members of the host community to infectious agents, chemicals, hazardous waste or other substances that may impact human health.

[6] See: Environmental Management Handbook for Military Commanders

At the organizational level, there are numerous initiatives undertaken by the Department of Operational Support (DOS), in collaboration with the Department of Peace Operations including:

- UN Environmental doctrine, including various mandates, policies, and strategies, which provide guidance for environmentally responsible mission deployment, reducing the environmental footprint of operation and leaving a positive legacy in the host community.[7]
- Strategic initiatives such as accelerating the transition of field missions, including T/PCC, to renewable energy sources for electricity generation, integrating positive legacy considerations in facilities and infrastructure projects and related facility management services, reducing energy, water, and other natural resources consumption, and minimizing solid and hazardous waste generation.
- The Unite Field Remote Infrastructure Monitoring (FRIM) and "Smart Camp" concept[8] to monitor energy and water consumption and the efficient operation of electricity generation, wastewater management and water treatment systems in peacekeeping settings.
- Improved conditions of living for Uniformed Components in Field Missions, including actions related to the Elsie Initiative for Women in Peacekeeping Operations and the Working Group on Operating Base Management & Accommodation in Field Missions.
- Other environmental performance improvement measures implemented in the context of the Supply Chain Management and the Category Management Initiative; and
- The expansion of the Logistics Support Concept beyond the UN Secretariat to include UN Agencies, Funds and Programmes as well as other stakeholder entities.

Environmental considerations in UN Peace Operations encompass a wide range of factors, including:

- energy supply and use.
- water supply, treatment, and use, as well as the generation.
- treatment, disposal, and reuse of wastewater and solid waste.
- Treatment and disposal of contaminated soil
- hazardous materials such as petroleum, oil, lubricant (POL) waste, chemicals, biomedical waste, and electronic waste.
- use of natural resources and the wider impact and benefits for the host community.

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[77] See:
- Environmental Policy for Peacekeeping Operations and Field-Based Special Political Missions
- Way Forward: Environment Strategy for Peace Operations 2030
- Environmental Management Handbook for Military Commanders in UN Peace Operations

Technical manuals and SOP
- SOP on Wastewater Risk Assessment and Reporting
- SOP on Environment Impact Assessment
- Water and Wastewater Manual for peacekeeping and special political missions in the context of field operations
- Waste Management Handbook for Peacekeeping Operations and Field Based Special Political Missions

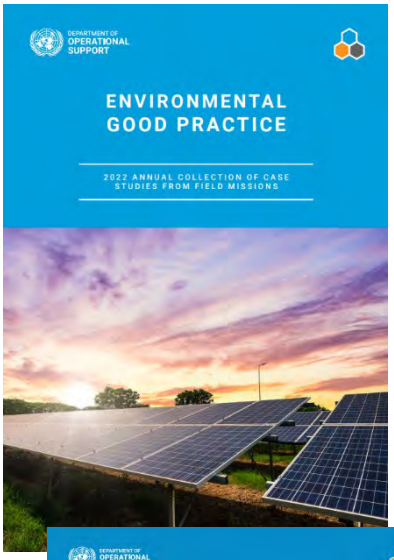
[8] See: https://frim.un.org/

However, challenges arise due to the lack of reliable services and infrastructure in host communities, necessitating self-sufficiency in energy and water supply, and waste management in many operational settings. This often leads to a heavy reliance on portable equipment like diesel generators and containerized wastewater treatment plants.

The fast-changing operational context, dynamic field settings, and the temporary nature of missions further complicate sustainable practices. Implementing the “Do no harm” principle is essential to minimize risks to the host community, ecosystems, and peacekeepers’ health and safety, while protecting the UN’s reputation.

Key risks include wastewater, waterborne diseases, solid waste, and hazardous waste. Responsible environmental management practices at the military unit level involve:

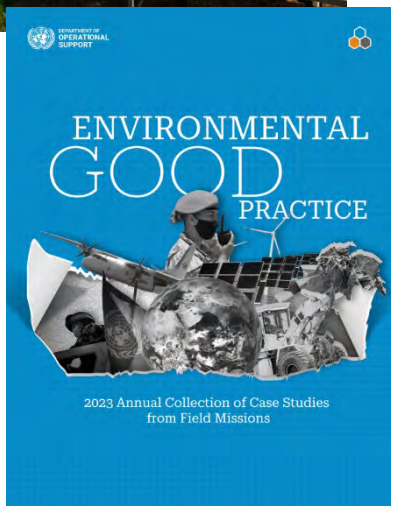
- environmental awareness and induction sessions.
- nominating an environmental focal point.
- ensuring compliance with UN environmental guidance.
- Efforts to reduce the environmental footprint include water and energy conservation, transitioning to renewable energy, minimizing waste generation, and revegetation initiatives.



MILENG can contribute significantly to improving environmental management practices in the field throughout the mission lifecycle.

There are numerous good practices from various missions that have been collected and are regularly updated on the Peacekeeping Resource Hub. Units are encouraged to draw inspiration from these examples, leveraging their specific capabilities to contribute effectively towards achieving the mission’s environmental goals.

By adopting these best practices, units can enhance their environmental management strategies, ensuring they align with the UN’s commitment to sustainability and responsible operations.



When military units, including MILENG, deploy to remote areas and establish temporary operating bases (TOBs), the transient nature of their presence necessitates heightened attention to environmental considerations. Given the limited duration of their stay, it is imperative that these units meticulously plan and implement responsible practices to mitigate their environmental impact.

This includes careful management of energy and water resources, waste treatment and disposal, and the handling of hazardous materials. By doing so, they not only uphold the “Do no harm” principle but also contribute to the long-term well-being of the host community and the preservation of local ecosystems.

The Annexes G through J[9] of this manual contain various tools (mission cards, best practices, checklists, etc.) for taking environmental considerations into account in all mission phases, especially in the event of liquidation or closure of a mission.

Adopting these practices ensures that even short-term missions leave a positive legacy, aligning with the UN's commitment to responsible and sustainable peacekeeping operations.[10]

Continuous efforts in **solid waste disposal**, **ammunition disposal**, and **contaminated soil disposal** are crucial.[11] Regular execution of these tasks supports the mission by:

- Preventing Accumulation: Regular disposal prevents the buildup of waste and contaminants, reducing the risk of environmental and health hazards.
- Maintaining Safety: Continuous disposal of ammunition ensures that potentially dangerous materials are managed safely and do not pose a threat.
- Ensuring Compliance: Ongoing efforts help maintain compliance with environmental regulations and standards, avoiding potential legal issues.
- Enhancing Efficiency: Regularly addressing these tasks can improve overall mission efficiency, as it prevents the need for large-scale, time-consuming cleanups at the end.

By integrating these practices into routine operations, missions can achieve better outcomes and uphold their commitment to environmental stewardship and public safety. Environmental Focal Points are to support the units in complying with those requirements and assist in identifying the appropriate areas for those tasks.

In the realm of energy supply, TCCs are strongly encouraged to transition to renewable energy sources and integrate them into their operational infrastructure. The Contingent-Owned Equipment (COE) Manual[12] outlines specific modalities for this transition and the employment of the respective equipment. The Department of Operational Support possesses the requisite expertise to offer tailored guidance and support.

[9] See Annex G to J

[10] See: Guidelines on Management of Temporary Operating Bases (TOBs) in United Nations Peacekeeping Missions

[11] See: Guidelines on Environmental Clearance and Handover of Mission / Field Entity / Field Entity Sites

[12] See: Manual on Policies and Procedures concerning the Reimbursement and Control of Contingent-Owned Equipment of Troop/Police Contributors Participating in Peacekeeping Missions. The current version is available through the UN digital library system https://digitallibrary.un.org.

1.4. Military Engineers in UN Mission Structure

1.4.1. Command and Control

MILENG Units are under UN Operational Control (OPCON) of the Force Commander/Head of Military Component (FC/HOMC).[13] In accordance with the Department of Peace Operations (DPO)/Department of Operational Support (DOS) Policy on Authority, Command and Control, OPCON includes the authority to assign separate tasks to subordinate units of a contingent as required by the Mission's operational necessities, in consultation with the Contingent Commander, and as approved by the Under-Secretary-General (USG) DPO.[14]

The FC/HOMC is authorized to assign military units under UN Tactical Control (TACON) of a designated commander for specific purposes and periods. UN TACON includes the detailed and local direction and control of movement or maneuvers necessary to accomplish an assigned mission or specific tasks.

Orders published by the Force Headquarter (FHQ) will be developed using the UN Military Decision Making Process (UN MDMP).[15] Those orders include an engineering concept of operations that the MILENG Unit must use to inform their own planning process.

Depending on the size of the mission (troop ceiling) and the mandate, the organizational structure for the military component may vary from mission to mission. While in smaller missions (usually military strength is below 6,000) all staff sections are directly led by the Force Chief of Staff (FCOS), larger missions (usually with a troop strength of 6,000~12,000 troops) may include the establishment of a Deputy Force Chief of Staff Operations (DFCOS OPS) to reduce the FCOS span of control.

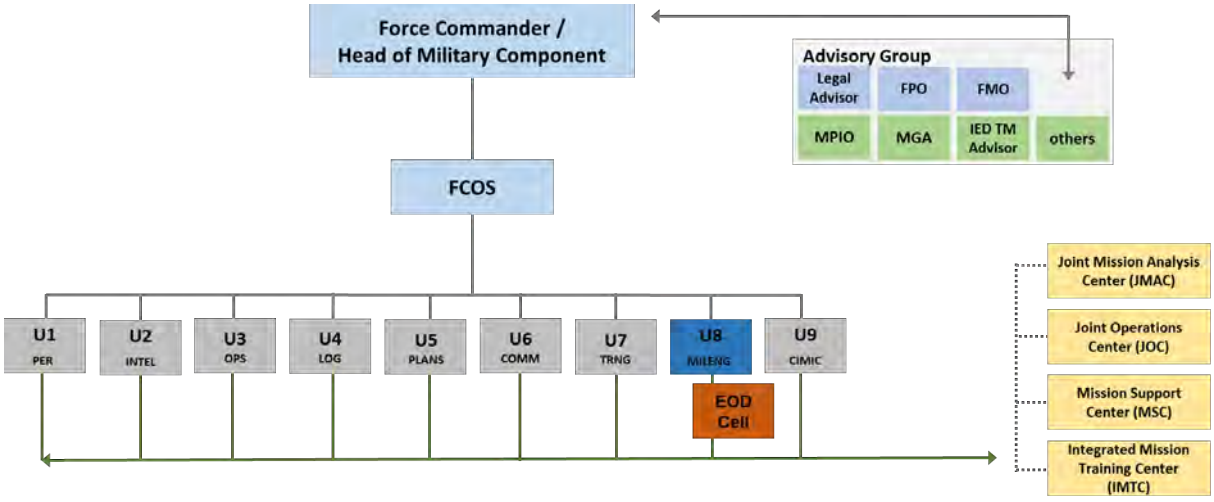


Figure 1.1: Standard Small/Medium Size Mission

[13] See: United Nations Deployed Military Field Headquarters Handbook

[14] See: Policy on Authority, Command and Control in United Nations Peacekeeping Operations

[15] See: United Nations Deployed Military Field Headquarters Handbook

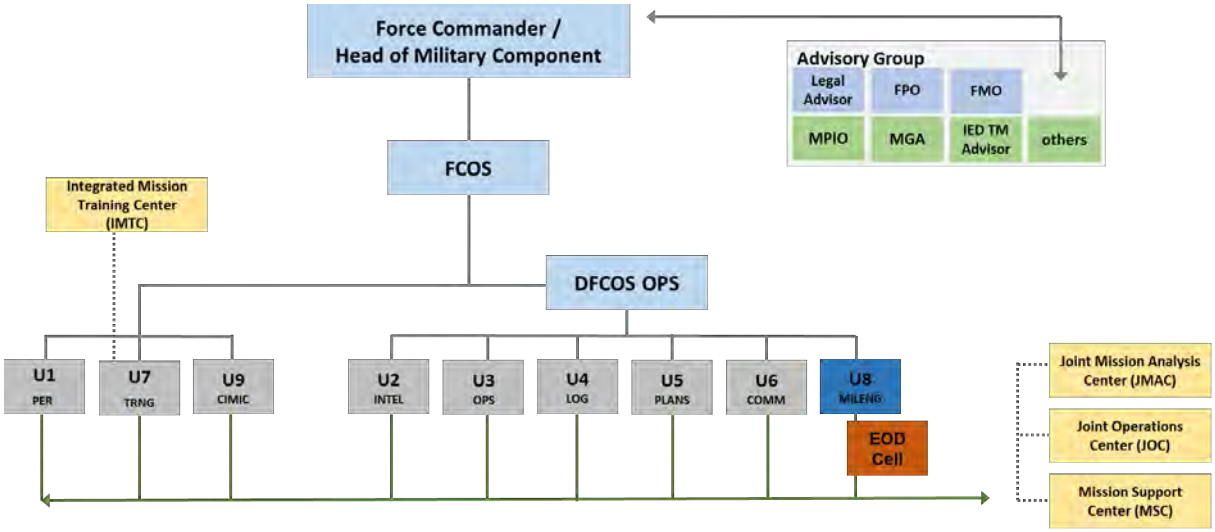


Figure 1.2: Standard Large Size Mission

In multidimensional peacekeeping operations a unified civilian, military and police effort require close coordination, synchronization, and information sharing across the different staff functions and components. To meet these demands, the Force HQ in a multidimensional mission with a military component above 12,000 troops are designed as a modular Force HQ to perform a joint and functional entity within Mission HQ. This would allow peacekeeping operations to better confront coordinate challenging tasks, including dealing with the violence of spoilers who seek to undermine the peace process or pose a threat to the civilian population, for more effective mandate implementation.

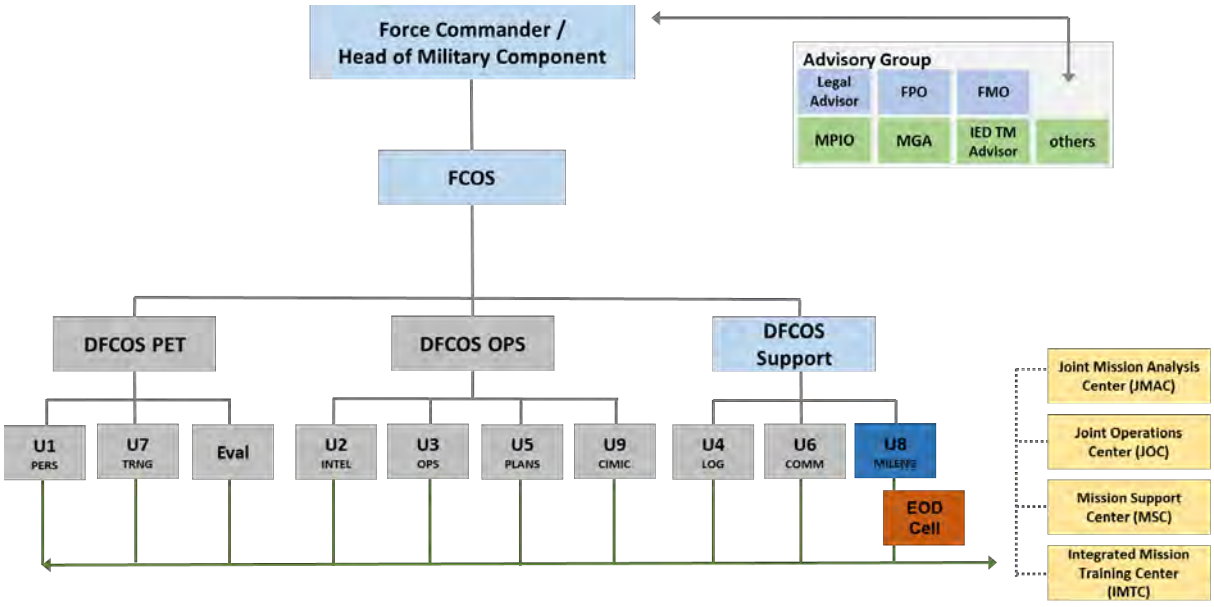


Figure 1.3: Standard Multidimensional Mission

Regardless of the nature and the size of the Mission, every FHQ has common functions executed by functional groups, including Military Engineering (MILENG). Within those functional groups, the U-8 or G-8 (MILENG) staff plans MILENG operations at Force and Sector level in coordination with overall Mission priorities.

MILENG units at the FHQ level may be tasked to support a specific Sector or unit for operational purposes (e.g., a specific operation or due to a required capability, etc.), upon request or by Force Commanders decision.

MILENG units organic to a larger Force can as well be requested from higher echelon to support a specific Mission of unit. Appropriate command relationships must be adhered to.

For any detachment or attachment, the transfer of authority must be detailed and agreed upon by all entities involved, corresponding orders to be given and issued by the FHQ.

Subsequently, orders must be issued defining the C2 structure, as well as the task and the relationship of the Supported and the Supporting Commander. This is especially important if MILENG units, not organic to a larger Force, are detached to support another unit.

Independent MILENG units at the FHQ level will be detached from the HQ to the respective Sector HQ (SHQ). In the case of EOD units and Construction Engineer units the Tasking Authority remains with entities in the FHQ/Mission level and are specified in Chapter 1.4.3.

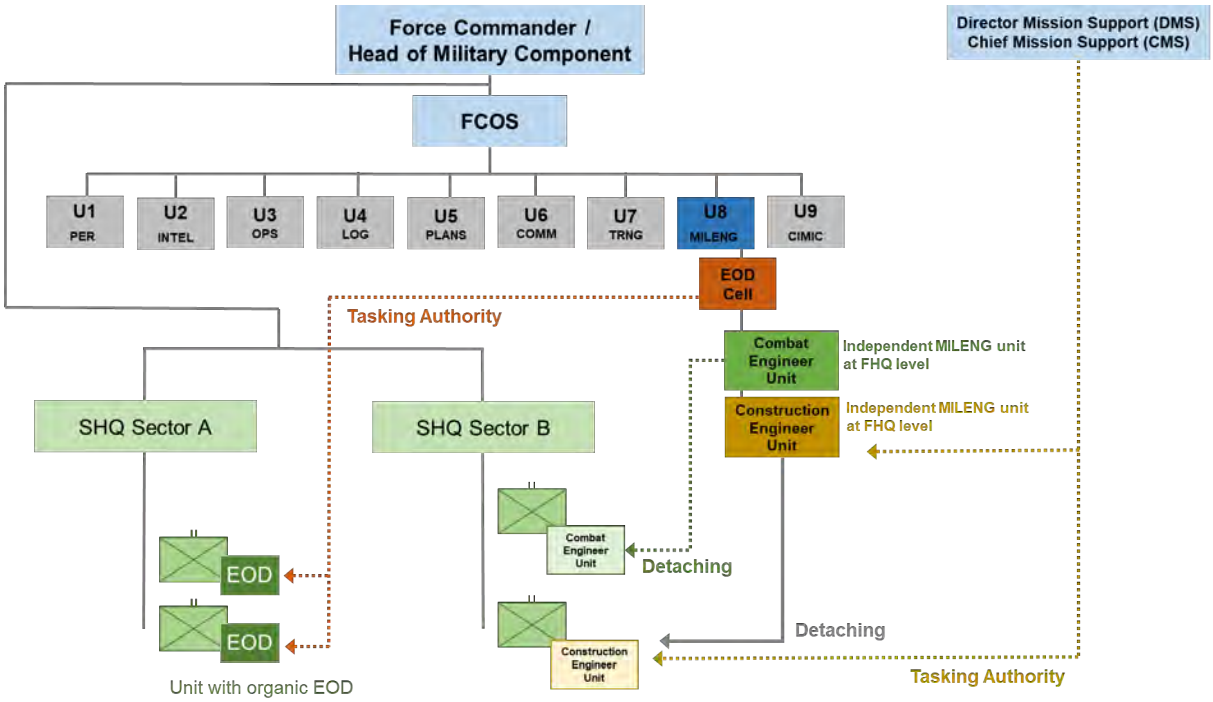


Figure 1.4: Command and Control / Tasking Authority

1.4.2. U-8 Branch / MILENG branch

The U-8 MILENG or Force Engineer branch consists, depending on mission structure and mandate, usually of at least 3 officers:

- Force Engineer (FE)
- Deputy FE (DFE)
- Military Engineer Staff Officer

Force Engineer Officer (FE). The FE is the senior military engineer and serves as the advisor to the FC and the branches within the FHQ, as well as for various mission elements on all engineering matters affecting military operations, and the coordination of military engineering support throughout the mission. The FE further acts as the link between the FHQ and Mission Support Division (MSD) especially regarding coordination of construction engineering matters.

This may vary from mission to mission, but usually the (military) FE is the deputy of the (Mission) Chief Engineer (CE).[16] He represents the Chief Engineer in his absence and coordinates tasks with the Engineering Section in the same way.

The FE could be as well dual hatted, and at the same time the U-8 branch chief, depending again on the mission structure and mandate.

Deputy Force Engineer Officer (DFE). The Deputy FEO is the Focal Point of the Mission Support Division (SD) Engineer Section (ES) or the Engineering and Facilities Maintenance Sections (EFMS) and reports to the FE. The DFE assists the FE in implementing the military engineering affairs and function of U-8 MILENG Branch. During the FE's absence, DFE, steps up as the Acting FE

MILENG Staff Officer. The Staff Officer is responsible for the documentation work (e.g., Submission of daily/weekly/monthly report etc.) and coordination with ES & Engineer Enablers for any engineering matters affecting the military. Attend the COE inspection as representative and observer from FE/U-8 office, attend Staff Sync and Force Commander Update Brief (FCUB) in absence of FE & DFE. Any other duties/tasks released by FE/DEF.

The primary responsibility of U-8 Branch is to plan and coordinate engineer capabilities (field/combat and construction) implementing MILENG tasks in accordance with mission priorities. The U-8 Staff Branch Responsibilities are:

- Collect and identify military unit's engineering support requirements, recommending the priority of engineer projects in coordination with Engineering Section (ES), monitor the progress of ongoing engineer projects.
- Upon delegation of the FC, FE is the tasking authority for the Combat Engineer units and coordination authority for the Construction Engineer units.
- Conduct Main Supply Route (MSR) and Secondary Supply Route (SSR) recce in coordination with ES, Sector, and military engineer contingents.
- Monitor, guide, and coordinate the military engineering operations on a daily, weekly, and monthly basis.

[16] See: Figure 1.6 "Collaboration MILENG with Civilian engineering".

- Performing field visit to field office, sector, to thoroughly inspect the progress of engineering projects, capture operational and logistical requirements as well as the challenges the unit facing.
- To be point of contact between Chief Engineer (CE) and military engineering contingent to facilitate the cooperation and coordination regarding any operational activities.
- As Team Leader, conduct Operational Readiness Assurance (ORA) and evaluation to all military Engineering Contingents during the tenure of the unit and responsible for drafting final report and grading.
- Conduct COE inspections (Operational readiness inspections as well as random spot checks) for all the military engineering units as representative and observer from FHQ to monitor and observe the status of the contingent-owned equipment.
- Perform field inspection for Ammunition Storage Area (ASA) in coordination with Senior Ammunition Technical Officer to facilitate the construction and utilization of ASA in the Mission AO.
- Close cooperation and coordination with Engineer Section (ES)/Engineering and Facilities Maintenance Section (EFMS) as well as Mission Support Center to follow up the construction of HW structures based on Force requirements.
- Communicate, cooperate, and coordinate with SSO Engineer, ES/ EFMS, Sectors, and Field Offices to formulate the planning of MSR/SSR for the incoming year.
- Close monitoring and reporting the progress of the MSR/SSR maintenance to the Force Leadership and providing support to the units in coordination with SSO, ES and MSC.
- Close coordination with U4 branch to accelerate engineering project tasks which highly correlated with logistics affairs.
- To coordinate with the Sectors on the issue of employment of engineer assets to extend support for inner engineering projects.
- Provide consultation and recommendations to the Force Leadership regarding the operational command and control of engineering contingents to support decision making process and utilization of engineering assets.
- Participate the reviewing and amendment of the current Statement of Unit Requirement (SUR) for the engineering units.

1.4.3. Tasking Authority

Under the UN Policy on Authority, Command and Control in United Nations Peacekeeping Operations, Combat Engineers and EOD Units are categorized as “combat support units”, for which the HOMC exercises sole tasking authority (in coordination through the Mission Support Center (MSC) and the Mission Air Operations Centre (MAOC)).

UN Combat Engineer Unit daily tasking priorities are routinely determined by the U-8 staff section/Force Engineer. The Force Engineer is the focal point for preparing Combat Engineer task orders consistent with FC priorities and Sector Commander requirements.

Construction Engineers and Composite Engineer units are categorized as “mission enabling assets”. Construction Engineers provide the Mission a vertical and horizontal construction capability[17] and rapid repairs to critical infrastructure that create or improve Mission self-sufficiency, Force and Mission mobility, protection of civilians and support to humanitarian efforts.

The FC/HOMC has direct tasking authority over the Combat Engineers, whereas Mission enabling resources[18]/assets, including the Construction Engineers, while still OPCON to the FC, are under the tasking authority of the Director/Chief of Mission Support (DMS/CMS) and/or his/her duly designated subordinates.[19] Construction Engineer daily tasking priorities are routinely determined by the Chief of Service Delivery Management (CSDM) under the delegated tasking authority of the DMS/CMS.

In missions where the Area of Operations (AO) is geographically expansive and forces are dispersed across various sectors distant from the Force Headquarter (FHQ), the tasking authority can be fully decentralized and delegated to the regional areas. This authority is then exercised by the designated DMS/CMS representatives.

A more detailed graphic depicting the interrelationship between MILENG as part of the Military Component and the civilian engineers is provided in the following chapter and the respective Figure 1.6 “Collaboration MILENG with Civilian engineering”.

The FC/HOMC is responsible to facilitate, via the U8 MILENG/FE the military Construction Engineer tasking process through coordination between the FHQ and the Office of the DMS/CMS ensuring compliance with overall Mission engineer priorities.[20]

EOD units are as well categorized as “combat support units” under the direct tasking authority of the FC/HOMC.[21] In addition to this the specific regulations of the United Nations Deployed Military Field Headquarters Handbook and the United Nations Peacekeeping Missions Military Explosive Ordnance Disposal (EOD) Unit Manual[22] apply.

According to this an EOD Cell (EODC) is to be established under the U-8 staff section. The EODC is the designated entity which provides operational control, planning, and administrative services related to EOD operations for assigned EOD units in a designated geographical area of responsibility, whether they are an organic, part of a larger force or independent units at FHQ or SHQ level.

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[17] Vertical construction includes the construction and rehabilitation of permanent and transient camps and existing structures. Horizontal construction includes the construction and maintenance of roads, bridges, airfields, and heliports.

[18] The term, “military enabling resources,” is a Department of Operational Support-preferred term specifically referring to military enabling assets (personnel and equipment) such as construction engineers, signals, aviation, logistics, transportation, medical and explosive ordnance disposal units, or smaller elements that may be deployed in Mission-controlled tasks. The term “enabling resource” and “enabling assets” refer to the same and can be used interchangeable.

[19] See: Policy on Authority, Command and Control in United Nations Peacekeeping Operations, Chapter: Tasking Authority for Mission Assets

[20] See Annex A for a detailed description of this tasking mechanism.

[21] See: Policy on Authority, Command and Control in United Nations Peacekeeping Operations
See: UN Peacekeeping Mission Military Explosive Ordnance Disposal (EOD) Unit Manual

[22] See: UN Peacekeeping Mission Military Explosive Ordnance Disposal (EOD) Unit Manual

The EODC is the force tasking authority for all EOD tasks, receiving notification of an EOD or IED incident and completed incident reports from all EOD units in their area of responsibility, subsequently providing respective tasking and control of disposal operations.

The **Military Composite Engineer Unit** is modular and scalable according to Force and Mission requirements, and provides the capability advantages of Combat, Construction Engineers and if required other MILENG capabilities (e.g., EOD, etc.). The Combat Engineers within the Composite Engineer Unit remains under the command and tasking authority of the FC, while the mission enabling assets, such as the Construction Engineers, remain under the tasking authority of the DMS/CMS.[23]

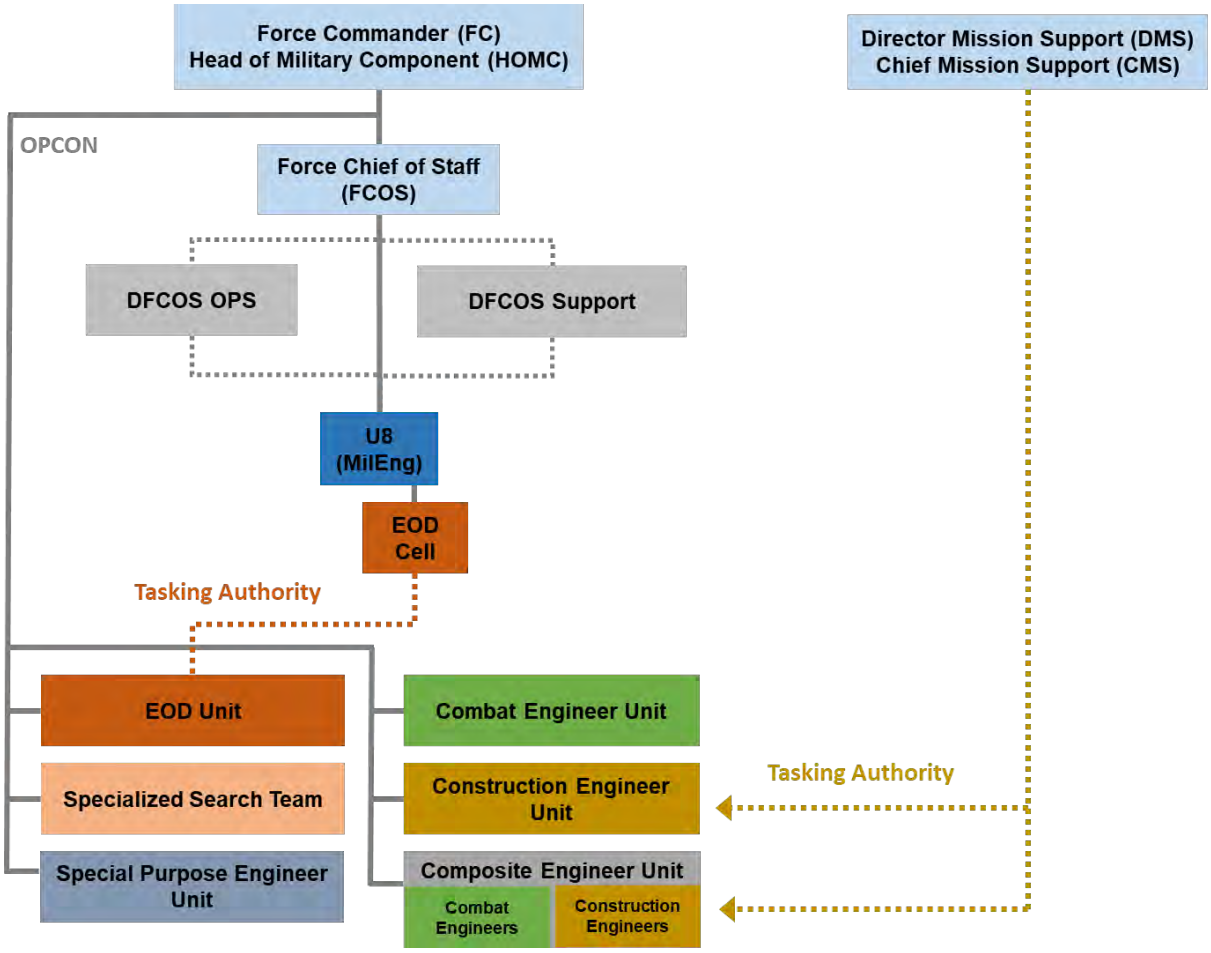

Figure 1.5: Command and Control / Tasking Authority

[23] Policy on Authority, Command and Control in United Nations Peacekeeping Operations

Detachment / Attachment

In instances where an independent MILENG or an embedded MILENG unit disposes specialized capabilities or operational requirements necessitate support for a specific task, the unit can be temporarily detached from the parental unit.

The process is initiated through a formal request from the Force Headquarter (FHQ) or the receiving unit via the established chain of command. If the request is approved and the unit/contingent commander shows consent, the MILENG (or EOD unit) is detached under tactical control (TACON) to the receiving unit for a specific task and for a specific period of time.

The tasking is executed by the host unit, with the distinctive feature that construction engineers are commissioned by the tasking authority of the DMS or CMS, or their representatives. Under certain circumstances, this can result in a completely new subordination and tasking relationship in the event of a dispute.

In principle, the readiness of a corresponding detachment should be agreed upon with the TCC as early as the formulation of the MOU, and the execution of such a specialty should be clearly defined.

For instance, a detachment should only be composed of personnel trained on the specific equipment they will use, or equipment should only be deployed with appropriately trained personnel. Additionally, details such as sustainment (including supply and medical support) and potential material damage must be prearranged.

The actual detachment then occurs within the framework of a corresponding tasking order. It is crucial to ensure that the appropriate chain of command is involved, so that, for example, a sector commander is informed when capacities from his area are temporarily seconded. This allows for appropriate measures to be taken, such as reprioritizing tasks, to ensure operational continuity.

The authority to assign tasks to both construction engineers and Explosive Ordnance Disposal (EOD) units may be temporarily revoked in situations of operational necessity or an emergency. Such scenarios include crisis, e.g. civil unrest, or natural disasters like floods, earthquakes, or fires.

In the face of those situations FHQ/HOMC assumes a pivotal role in coordinating a swift and coordinated response. The issuing of immediate directives and task orders to MILENG Construction Engineers, who are subsequently mobilized to execute critical tasks, to safeguard the overall mission, United Nations personnel, or the local community, takes precedence over other duties. Through this mechanism, the FHQ/HOMC ensures the optimal deployment of military construction engineering assets, thereby mitigating damage, safeguarding civilian lives, and restoring stability with utmost efficiency.

This temporary revocation does not necessitate a formal procedure but falls under the purview of the commander with OPCON over the relevant forces. The commander must clearly communicate the suspension of tasking authority to the DMS/CMS, respective the EODC, through the chain of command, ideally specifying the duration of the suspension to facilitate adjustments to existing plans. This regulation should be invoked only in exceptional circumstances to avoid fundamentally disrupting established structures.

1.5. Collaboration with Civilian engineering and other actors

MILENGs, particularly construction engineers, work very closely with civilian engineers under the DMS/CMS. The DMS acts as the tasking authority for assets categorized as mission-enabling. This collaboration requires meticulous coordination and a constant focus on mission priorities. Civilian engineering activities are governed by the DOS Engineering Support Manual for Field Missions[24], which outlines distinct procedures to be followed.

The importance of close cooperation between military and civilian engineers is especially pronounced at the beginning and end of a mission.

At the onset of a mission, civilian engineers often initiate the establishment of the first camps before any military contingent is deployed. During this phase, it is crucial to integrate military aspects such as threat assessments, base defense considerations, and the size of the footprint required to secure the camp. Even if no military contingent has been deployed yet, expertise can be provided in close cooperation with the Office of Military Affairs of the Department of Peace Operations. This office can either offer its own expertise or facilitate early engagement with the first designated military contingent to ensure that military requirements are adequately considered from the outset.

Similarly, during the drawdown of a mission, the dismantling of camps and other installations necessitates close cooperation. This phase involves minimizing environmental impact and addressing specific challenges such as the disposal of remaining UN ammunition in the mission area. Ensuring a smooth and environmentally responsible handover requires the combined efforts of both military and civilian engineers.

In conclusion, the effective execution of mission priorities relies heavily on the seamless integration of military and civilian engineering efforts. This cooperation is essential at all stages of a mission to ensure the construction and deconstruction phases meet the necessary standards and address all pertinent considerations.

At the field level, dedicated Engineering Sections (ES) or Engineering and Facilities Maintenance Sections (EFMS) undertake a range of activities and functions covered by this manual including:

- Engineering construction and maintenance
- Water source exploration and water collection
- Treatment, management of wastewater, solid waste management
- Power generation and electromechanical.

In doing so, EFMS uses three types of resources: MILENG units; contracted civilian vendors; and in-house capacity. Each type of resource has distinct roles and functions as well as different command and control and tasking authority, with contracted civilian vendors having significantly different responsibilities to MILENG units.[25]

[24] See: DOS: Engineering Support Manual for Field Missions

[25] See: DOS: Engineering Support Manual for Field Missions

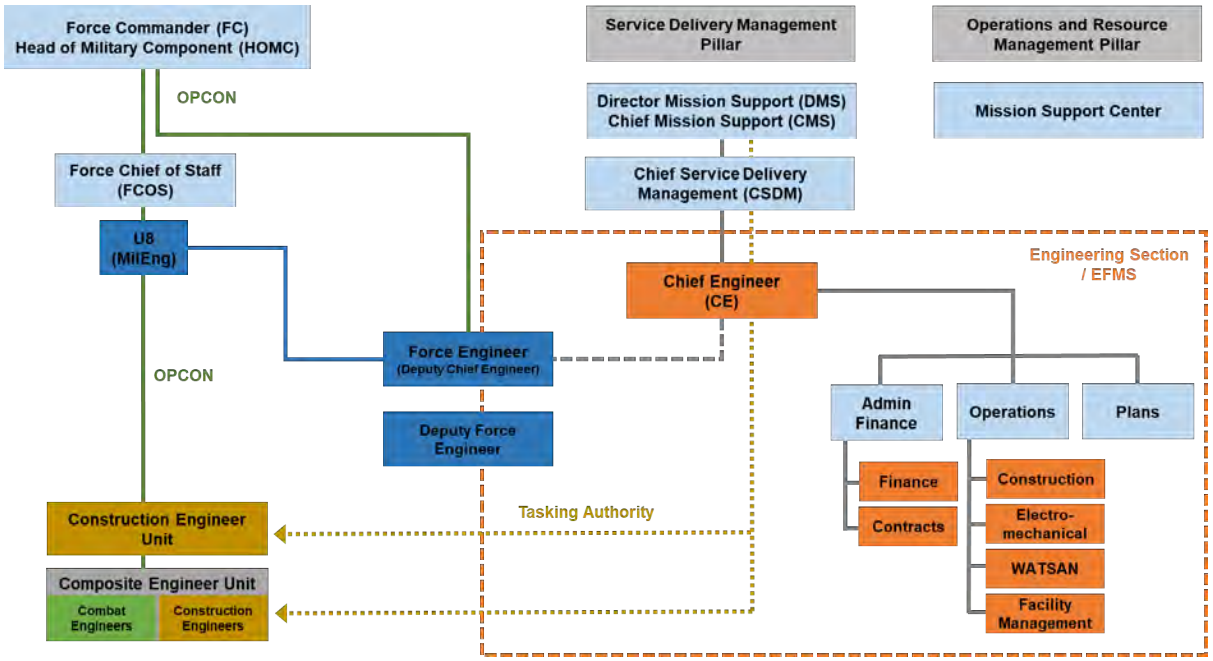

Figure 1.6: Collaboration MILENG with Civilian engineering

1.6. Reporting

The uninterrupted flow of information is essential for the safe and effective conduct of operations. Staff, troops, and units need to communicate timely, clearly, and concisely so that appropriate measures can be planned and executed successfully.

Reporting significantly contributes to enhanced situational awareness. This enables HQs – regardless of the level –to make informed decision and adjust ongoing operations based on the response and impromptu situations that may arise.[26]

The reporting of explosive incidents should include, where possible, and at the earliest stage, technical and tactical information to understand the TTPs of the perpetrators.

The primary tool to record and maintain data regarding all explosive incidents is the UNITE AWARE platform, and relevant entity's respective Situational Awareness Geospatial Enterprise (SAGE) application to allow continuity and exchange within and across Missions and with UN HQ. For the reporting on explosive incidents see the UN IED Threat Mitigation Handbook and the UN Explosive Ordnance Disposal (EOD) Unit Manual.

Missions are to provide unified reporting formats, which can be used using mobile communication means (radios). Standardized report and message formats enable easier interpretation and efficient exchange of information. The standardization of forms is particularly important in combined operations as they reduce the impact of different operating languages and ease the collation and transmission of complex information.

[26] See: United Nations Deployed Military Field Headquarters Handbook

To be fully effective and ensure the maximum benefit, reporting must be:

Accurate	Timings, locations, events etc. must be precise.
Complete	All available information relating to an incident must be gathered and all incidents must be reported.
Linked	Any links to individuals, geographic areas, conditions, should be readily identified and understood.
Timely	Dissemination of peacekeeping-intelligence and lessons learned to the right recipient at the right time.

All commanders are responsible for ensuring that their personnel are familiar with the reporting format and can use these even under stress.

MILENG units are to submit reports on their activities, progress, challenges, and resource requirements to higher command levels, typically on a weekly or monthly basis.

They conduct field observations and assessments to gather first-hand information on infrastructure conditions, needs, and challenges. They incorporate these observations into their reports to provide accurate and context-specific feedback.

Field observations and assessments play a crucial role in gathering first-hand information about infrastructure conditions and needs, which are integrated into their reports for context-specific feedback.

After conclusion of major engineering activities or projects they are to submit After Action Reviews (AAR) to evaluate performance, identify lessons learned, and make recommendations for improvement. AARs help refine procedures, enhance effectiveness, and build institutional knowledge within the engineering units.

Comprehensive technical documentation, including engineering plans and project reports, is to be maintained and shared with Civilian Engineers to ensure transparency and accountability.

1.7. Organizational Learning/Best Practice

The capability of organizational learning is critical to successful Peacekeeping because it ensures that lessons learned flow directly into training and thus ensure that personnel are better prepared. The process should not only focus on which procedures, etc. need to be improved, but also which ones have proven successful, to provide positive confirmation that no adaptation is necessary, and peacekeepers can be confident in using current best practices.

This will require formal and informal reporting methods and the submission of detailed after-action reports. Commanders and staff need to develop a simple and straightforward process that encourages people to share their experiences. Complicated forms and elaborate procedures should be avoided; otherwise, there is a risk that no one will want to participate. Modern means, such as online questionnaires or the like, should be used whenever possible.

Furthermore, MILENG commanders in the field must be forthcoming and candid in the acknowledgement of errors so others may learn, missions may be better accomplished, and injury and loss of life would be avoided.

An After-Action Review (AAR) is an analysis of an action, activity or project that allows personnel to reflect on what went well; identify areas of improvement, and suggest recommendations to enhance similar actions, activities or projects going forward. An AAR can be a brief discussion or longer exercise depending on the topic at hand and is most often conducted through a guided group discussion. AARs are not a performance review tool and should be conducted in a spirit of openness, honesty, and learning. The conduct and procedure of AARs should be in line with the respective DPO-DPPA Policy[27].

The process should closely involve the Best Practice Officers in the field, and they should play a key role in implementing this process.

The best practice officers have a special role to play in actively contributing within a Mission, but also in exchange with other UN Missions in the region and in cooperation with the UNHQ. Among the important tasks are:

- Actively liaising with appropriate units on a regular basis (e.g., monthly) to obtain information and collect best practices regarding successful implemented mitigation measures, procedures, information regarding new trends (e.g., composition of IEDs, materials used, etc.).
- Recording and documenting the collected information.
- Writing best practice reports with supporting graphics and/or photos to be shared with all individual uniformed personnel and contingents, other peacekeeping missions in the region and the OMA.
- Publish the reports on a mission-wide, but mission-restricted accessible online platform.
- Communicate the collected best practice with other staff, especially U-7 to allow adjust the in-mission training.

The results are to be shared with all stakeholders in an equally effective manner. This does not only include any contingent or individual in the mission, but also TCC/PCCs, doctrine writers and training teams, to ensure overall awareness. A centrally accessible archive must be provided so that older reports can be compared with new findings at any time.

1.8. Rotation of Military Engineer Units

To effectively prepare for the challenges posed by changing seasonal conditions, it is advisable for MILENG units to initiate their rotation process at least three months prior to the anticipated onset of new weather patterns or environmental shifts. This proactive timeframe is essential as it affords sufficient opportunities for comprehensive training, acclimatization, and necessary operational adjustments tailored to the specific challenges each season may present. By allowing for a preparatory period, units can engage in targeted training exercises that focus on seasonal challenges, such as extreme temperatures, increased rainfall, or potential flooding, thereby enhancing their readiness to adapt to these evolving circumstances.

Moreover, this advanced planning period facilitates the gathering of critical information regarding local weather patterns, geographical changes, and the associated impacts on infrastructure and community needs. During this time, units can collaborate closely with local authorities and stakeholders to assess potential vulnerabilities and strategize effective engineering responses, ensuring that projects remain aligned with the evolving requirements of the mission area.

[27] See: Knowledge Management and Organizational Learning Policy

Acclimatization is another key aspect of this preparatory phase, as personnel will need to adjust to new environmental conditions, which can significantly affect their performance and health. By implementing gradual exposure to the local climate and conducting medical assessments, units can mitigate the risks of heat-related illnesses or other climate-induced challenges.

By commencing the rotation process three months in advance, military engineering units can enhance their operational effectiveness, ensuring they are well-equipped to meet the unique demands of each season and contribute meaningfully to the stability and development objectives of the Mission. This strategic foresight not only improves unit readiness but also fosters a greater sense of cohesion and adaptability within the unit, which is crucial for successful mission outcomes.

2. Capabilities and Tasks of the Military Engineer Unit

The core capabilities of the MILENG Unit include Combat Engineering, Construction Engineering, EOD and Support to Mission Partners.

2.1. Combat Engineering Capabilities and Tasks

Combat Engineer Units are modular and scalable according to force requirements but generally include obstacle crossing capability (including gap and river), the establishment of field defenses for Force and Sector Headquarter (FHQ/SHQ) that are beyond other contingents' capability, Force Protection (FP) and limited road, airfield, and landing zone repair.

Combat Engineers (whether deployed as a separate Combat Engineer Unit or as an element of a Composite Engineer Unit) are in direct support of military operations. As such combat engineers are required to deploy personnel and equipment on short notice into what may be hostile and dangerous environments. Accordingly, the units must be capable of providing their own FP, including the use of personal and crew-served weapons.

A Combat Engineer Unit is tasked (within its capabilities) to ensure the Force and its subordinate elements, operate safely, unimpeded by obstacles along lines of communication in the AO. The UN military component's transportation, logistics, medical and first responders depend on the UN Combat Engineer Units.

Mobility (MOB) permits the Mission to move from place to place while retaining the ability to fulfil the mandate of own forces and friendly actors. Military forces require the ability to move rapidly and freely in the area of operations in order to fulfil their primary mission. Mobility is necessary to deploy rapidly, achieve concentration of forces and to engage or disengage from the adversary.

Hence, mobility is a primary concern. Guaranteed mobility allows the commander freedom of action within the operational area.

All arms units will attempt to maintain mobility by use of their integral resources and efforts. When obstacles are encountered, the preferred methods for overcoming them are normally:

a. Bypass of obstacle(s).

b. Hasty action. Use of organic resources with little or no additional orders being given. This will normally involve integral assets being used to breach or reduce obstacle(s).

c. Deliberate action. Extra planning and preparation in the form of deploying specialist resources following a reorganization and coordination of efforts. This will normally involve specialist assets being brought into breach or reduce obstacle(s).

Supporting the mobility of friendly forces is a key engineer responsibility. A significant percentage of engineer vehicles and equipment are designed specifically, but not exclusively, to support the maintenance of friendly force mobility. Some engineer units or sub-units are organized and equipped specifically for mobility activities.

In supporting the mobility of all arms units / formations, the main engineer activities are:

- Route and Area Clearance[28] (including Route reconnaissance).
- Breaching.
- Gap and river crossing.[29]
- Road construction and repair (Lines of communications (LOC) in general, but primarily focused on Mains and Secondary Supply Routes (MSR/SSR).
- Support to aviation (e.g., building and maintaining airfield infrastructure including runways and helipads), and
- Support operations of maritime assets (e.g., amphibious operations, beach landings, etc.)

Counter-mobility (CMOB) support will prevent movement or maneuver to the adversary. It will also hamper FOM in the AOR.

CMOB aims to hinder an adversary's maneuver through the reinforcement of natural obstacles and the establishment of manufactured obstacles. It supports the commander's plan by shaping the physical operating environment with the intent to turn, block, fix or disrupt the adversary's forces.

Obstacles can be emplaced manually, mechanically or by remote means including indirect fire as well as fixed and rotary wing aircrafts. For obstacles to be effective they need to be covered by observation in conjunction with direct and indirect fire.

Survivability (SURV) includes all aspects of physically protecting personnel, weapons, and materiel from the effects of adversary weapons and detection systems. It may also include camouflage, concealment, and deception measures. Survivability advice and activities are the main contributions of the MILENG to Force Protection. The main engineering survivability activities are:

- protective works and fortifications.
- support to camouflage, concealment, and deception.
- support to CBRN defence[30];
- countering explosive threats.

[28] The removal of the immediate threat from mines, UXO and IEDs along a route. UN Peacekeeping Missions Military EOD Unit Manual (Sep 2017) 4.3.1.2 "Force Protection (FP) Engineering Activities"

[29] For example, with lightweight, transportable, modular assembly, mounted and dismountable equipment and material (e.g., Bailey bridges, REBS/ rapidly emplaced bridge system, LMCS/ Lightweight Modular Causeway System, etc.)

[30] Military Engineers generally have the capability for CBRN defense. However, a corresponding threat would have an impact on all members of the mission, especially UN civilian staff, who are neither trained nor equipped for such a scenario. In this respect, this capability is mentioned but assessed unlikely and not further considered. Even support in the event of the release of toxic industrial chemicals (TIC) or similar substances would involve considerable material requirements that cannot be established ad hoc but require appropriate advance planning.

- managing explosive threats[31];
- support to military search; and
- water supply.

Survivability Support includes the creation of observation posts and check points, as well as technical reconnaissance and surveys of existing and prospective installations to include gathering information on water, power, terrain, and infrastructure. Combat Engineers are also tasked to support the establishment as well as the relocation and re-deployment of Temporary Operating Bases (TOB).

Effectively mitigating the explosive threat supports other Combat Engineer tasks including establishment of field defenses, enhancing installation security and access control, performing observation activities during hours of darkness while able to pinpoint EO locations. Depending on the level of explosive threat, the FC/HOMC may elect to concentrate all EOD teams under a unified authority to coordinate the employment of this specialized capability. The teams should also be capable of communicating via VHF and HF communications and have their own logistic support element capable of supporting deployment.

Search is the planning, management and application of systematic procedures and appropriate techniques to confirm the presence or absence of specified targets in the support of the full spectrum of operations. Specified targets may include people, vehicles, routes, areas, locations, buildings, and material resources employed by a perpetrator or to be used by friendly forces or concealed threats such as conventional weapon systems, items of Explosive Remnants of War (ERW) and IEDs and components thereof.

These tasks require pre-planning and coordination to obtain the appropriate resources and coordinate the layout and preparation of these defenses into the overall Force plan. Sub-tasks may include surveying, site preparation, earthworks, and the preparation of defensive FP positions for Force and SHQ that are beyond other contingent's capability, including barricades for ammunition storage in line with the UN Weapons and Ammunition Management Policy.

A Combat Engineer Unit is tasked to make field expedient repairs to maintain military operational momentum. These repairs are made with the best materials on hand and as quickly as possible to maintain the military operational tempo. Sub-tasks may include earthworks, drainage, site preparation, paving and vertical signaling/route marking of roadways.

2.2. Construction Engineering Capabilities and Tasks

Construction Engineers are Mission military enabling assets and, while under the OPCON of the FC/HOMC, are under the tasking authority of the DMS/CMS and his/her designated subordinates such as the Chief of Service Delivery Management (CSDM) and the Chief

[31] In this manual, "EOD" and "Demining" are separate described intentionally. EOD and Demining tasks are based on Mission structure, requirements of FC/HOMC and UN-TCC MOU. Demining is not traditionally an EOD task but is a core Combat Engineer capability supported by EOD units where appropriate (example: discovery of mines altered to detonate in a manner other than originally designed).

Engineer. Tasking authority, under DPO/DOS policy, "includes the authority to deploy, redeploy and employ all or part of an enabling unit to achieve the Mission's mandate."[32]

The U-8 Force Engineer is responsible for identifying and assigning military Construction Engineer units to respond to DMS/CMS tasking.

Construction Engineering requires the capability, including equipment and expertise, to provide rehabilitation and maintenance of LOCs, infrastructure for air and maritime/riverine assets, as well as existing infrastructure (to include buildings, water supply, wastewater disposal, etc.)[33]. Construction Engineers also provide capabilities for the construction of physical protection measures for UN installations.

Construction Engineering is categorized into vertical and horizontal construction.

Vertical Construction capabilities include the building (installation, commissioning and decommissioning) of rigid/semi-rigid and prefabricated structures, the rehabilitation and repair of existing structures, well drilling and surveying.

- **Rigid/semi-rigid or prefabricated structures** (such as purpose-built container-type modular units) ensure the Mission infrastructure has adequate shelter for operational, administrative, accommodation and protective purposes on a continuous and extended basis. Rigid/semi-rigid and prefabricated structures must have sufficient strength to provide protection from local weather conditions. Given the construction's enduring intent, sub-tasks may include site planning, building foundations, main frame construction work, water distribution and electrical systems, drainage, internal finishing, and utility work. Ensure adequate and safe supply of electricity to the structures/buildings.
- **Rehabilitating and repairing existing structures**, if done early and using the right materials and tools, allows the Mission to prolong the usable life of the structure while at the same time saving expenses for new constructions. Rehabilitation and repair work priority is determined based on the structure's function within Mission requirements and degree of damage/deterioration. Associated sub-tasks include physical inspections, cleaning, maintenance, and repair work, which further may include improvements to electrical networks[34], water supply and sanitation, such as the construction of ablutions and separate plumbing drains for "grey" [35](dirty) water[36] and sewage.
- **Water Supply / Well Drilling**[37]. One of the most important requirements for a UN force is an adequate water supply. Portable water is often not readily available in many Mission areas. The need for water will be in two major areas: water required by field units and water required by UN installations and static units. Water supply to field units and formations will normally be provided by integral resources. Raw water

[32] Policy on Authority, Command and Control in UN Peacekeeping Operations (Oct 2019), paragraphs 30 to 33.

[33] Environmental engineering activities and tasking, e.g., waste management, water treatment and sanitation, in compliance with environmental protection should be performed.

[34] Electrical Engineering capability is lacking in most missions. Unit specialization is required.

[35] Grey water to include water from showers, handwash basins, laundry, and transport workshop.

[36] Sewage to include wastewater from sewages lines (toilet and septic tank), camp drainage (from storm water from rain system open or close system

[37] Well Drilling is a highly specialized task that requires expertise in geology and geophysics, core drilling, mud assessment, coring, various environmental aspects, logging, laboratory testing, etc.

sources will be used if domestic reservoirs are not available. Liaison with the appropriate staff branch is necessary in obtaining the use of domestic water resources from the host nation. Water must be sourced (e.g., by **well drilling, surface water/river/lakes, municipal water, etc.**) treated (**purification**), stored, distributed, issued, and disposed. Water quality standards must be appropriate for a range of uses including drinking, cooking, washing, laundry, medical, firefighting and water-borne sewerage systems.[38] Water services include purification, bulk storage with distribution being achieved through bulk deliveries, packaging, and/or pipelines. With the supply of water

MILENGs contribute to quality of life and sanitation of the Mission personnel, but equally to the local communities by conducting generic water producing tasks including well drilling.

- **Surveying Tasks**. Surveying is critical to the precise design and execution of all engineer construction projects. Surveying sub-tasks involve the precise measurement of distance, elevation and angles associated with terrain features and any existing structures on the construction site. One type of survey is done for planning purposes and focuses on the terrain and on-site features. Another type of survey focuses on the structure under construction and determines the detailed position and dimensions of that structure. Effective surveys require meticulous measurement, quantitative data recording and conscientious application of appropriate engineering standards.

Horizontal Construction capabilities involve construction, repair, and maintenance of LOC, such as roads, including bridges and installations for the employment of air and maritime/riverine assets, such as airfields, launch/recovery, or mooring areas.

- **Road Construction, Repair and Maintenance Tasks (MSR/SSR)**. Roads are vital for command and control, facilitating communications, maintaining security, and providing for logistical resupply. Well-built and maintained roads benefit everyone and provide essential socio-economic benefits to the local community. The continuous movement of people and heavy vehicles, plus the damage done by severe weather, means road maintenance must be done as soon as deterioration is detected. Early maintenance and repair are necessary to keep Mission operations flowing smoothly and without interruption. Sub-tasks include, but are not limited to, site surveys, earthworks, culvert, and paving projects.
- **Bridge Installation, Repair and Maintenance Tasks**. The installation, construction, repair, and maintenance of bridges along lines of communication are critical to the Mission operations. The benefits and importance of proper bridges equal or exceed those of roads. Sub-tasks include but are not limited to topographic surveys, earthworks, site preparation, drainage, foundation work, main frame construction or installation of prefabricated bridges and paving projects.
- **Paving Projects Tasks.**[39] Road paving projects include asphalt and concrete paving. Paving strengthens the road surface, prevents road damage from traffic, and reduces or eliminates road surface dust by preventing the scattering of road surface material.

[38] See: DOS Manual on Water and Wastewater Manual for UN Field Missions

[39] Paving is a highly specialized professional work that requires laboratory testing for compliance with technical norms and specialized equipment.

- **Airfield and Heliport Construction, Maintenance and Repair Tasks**. In Mission areas with weak or non-existent road and rail networks, the construction, maintenance and repair of airfields and heliports provide a critical infrastructure to implement the Mission mandate and are important as a logistical and medical lifeline. Sub-tasks include topographic surveys, site plans, site preparation, paving and drainage projects.
- **Maritime/riverine assets facility Construction, Maintenance and Repair Tasks.** In Mission areas with waterways, the construction, maintenance, and repair of launch/recovery areas for small watercrafts or mooring areas for larger maritime/riverine assets provide a critical infrastructure in support of maritime and/or riverine operations to implement the Mission mandate and are important as a logistical and medical lifeline. Sub-tasks include topographic surveys, site plans, site preparation, paving and drainage projects.
- **Drainage Projects Tasks**. Drainage problems have numerous negative effects including deterioration or destruction of property, on-going projects and existing roadways and bridges. Poor drainage can halt transportation, threaten command and control, Mission operations, resupply, and medical support. Persistent drainage problems can lead to diseases such as malaria and cholera. It is vitally important for engineers to design the correct size and type of drainage considering existing infrastructure and the typical amount of rainfall, river overflow and tides.
- **Earthworks and Site Preparation Tasks**. Earthworks and site preparation are the reshaping of land by cutting, levelling, filling and compacting earth to the desired shape using earth moving equipment. Earthworks and site preparation are fundamental to other engineer projects as they provide the basis upon which roads and bridges are built or upgraded, foundations and drainage are created for new projects, and berms put into place for FP.
- **Dyke Construction and Maintenance Operations:** In regions vulnerable to inundation during periods of intense precipitation, the construction and upkeep of dykes are paramount. These structures are engineered to regulate water flow, thereby averting flooding and managing water levels in areas of low elevation. The strategic implementation and maintenance of dykes are critical in ensuring the accessibility of roadways and the protection of low-lying infrastructures. By fortifying these barriers, the risk of flood damage can significantly be mitigated, thereby preserving the integrity of essential MSR/SSR and safeguarding vulnerable communities.

2.3. EOD Capabilities and Tasks

The core capabilities of the UN military EOD unit include:

- Conventional munitions disposal (CMD) activities.
- Improvised explosive device disposal (IEDD) activities.
- Support to mission partners.

EOD is an operational enabling function contributing to Freedom of Movement (FOM) and FP. To support and advise the commander on EOD related matters (including the rendering safe of IEDs), EOD structures are integral to the UN military component.

EOD elements are always in high demand and there is nearly always a shortage of trained personnel. Additionally, there is an elevated level of risk to such personnel. Consequently, they are normally coordinated directly by the HQ and work prioritized accordingly. EOD units are in direct support of military operations and thus come under the direct tasking authority of the Head of Military Component (HOMC)/Force Commander, which in turn is provided by the EOD Cell (EODC), as depicted in Figure 1.1: Command and Control / Tasking Authority.

The UN Peacekeeping Missions Military Explosive Ordnance Disposal (EOD) Unit Manual addressed in detail all aspects regarding Explosive Ordnance Units, including the capabilities and tasks, various levels of qualifications for EOD and IEDD, etc.[40]

EOD teams are often deployed in conjunction with other capabilities, such as FP elements, search teams and Counter-Radio-Controlled-Electronic-Warfare (CREW) assets[41].

Deployment of search assets along with, in support of, and in support to EOD teams is most common. Search is a key enabling activity in EOD and refers to the capability to locate specific targets using threat assessments, systematic procedures, and appropriate detection techniques to locate and detect concealed threats.[42]

All mobility units[43] are to count with an All-Arms Search Teams (AAST) comprised of trained searchers, equipped with precision search equipment and Electronic Counter Measure (ECM) equipment (e.g. Jammers), capable to conduct basic search procedures, Route Search or even Intermediate Search.[44] As it is a capability that is generally required by all mobility units and whose understanding and application is expected of all persons in the AO, the UN IED Threat Mitigation Handbook contains an annex in which Military Search is explained in detail.

EOD teams also perform search procedures that are an integral part of their procedures. These are not explained in detail as they are part of the national Tactics, Techniques and

[40] See: United Nations Peacekeeping Missions Military Explosive Ordnance Disposal (EOD) Unit Manual

[41] See: United Nations Peacekeeping Missions Military Explosive Ordnance Disposal (EOD) Unit Manual

[42] Conventional weapon systems, items of ERW and improvised explosive threats and components thereof and in particular IEDs.

[43] Mobility units are defined as units moving outside the secured perimeter of a UN installations to execute any given task.

[44] See: UN IED Threat Mitigation Handbook, Annex Search

Procedures (TTPs) and are standardized as part of the EOD qualification (CMD or IEDD) in accordance with the requirements of the international mine action standard (IMAS).[45]

Specialist Search is a key operational capability of Combat Engineers. It refers to the capability to conduct search operations in an area where; the operating environment is assessed to be non-permissive[46] or a hazardous environment exists, and includes:

- Protective Building Search
- Aircraft Search
- Vessel Search
- Hazardous Environment Search
- Secondary Vehicle Search

All Arms Search (AAST) and Specialized Search Teams (SST) will often work in concert with an EOD/IEDD team.

EOD units usually do not have their own search teams, and if all mobility units have appropriately trained and equipped search teams, this is not necessary. Depending on the capacity in the UN Mission, it may be necessary to discuss with the TCC providing an EOD unit whether an organic search team is required.

EOD teams and search assets can be combined in a composite unit that has both capabilities or they can be task organized in different units and brought together for a given operation or task. It is common for both asset types to be deployed together.

All EOD tasks are listed in detail in the UN Peacekeeping Missions Military Explosive Ordnance Disposal (EOD) Unit Manual.

2.4. Demining Capabilities and Tasks

MILENG and civilian demining organizations both engage in landmine removal, but their capabilities and approaches differ significantly.

Military engineers are typically equipped for rapid mine clearance in conflict zones, using heavy machinery, explosives, and specialized training to clear paths quickly for advancing troops. Their focus is often on speed and effectiveness in high-risk environments, sometimes prioritizing tactical needs over thoroughness.

In contrast, civilian demining organizations prioritize safety and thoroughness, often working in post-conflict areas to ensure that land is completely free of mines for civilian use. These organizations typically use both manual and mechanical methods, trained personnel, and specialized detection equipment to carefully locate and remove each mine, often working in collaboration with local communities to ensure long-term safety.

[45] See: https://www.mineactionstandards.org

[46] Activities undertaken where the assessed risk posed by specified threats is assessed as probable. For example, where specific U2 indicates the presence of emplaced IEDs.

The contrast lies in the urgency and scope of operations, with military engineers focusing on tactical clearance and civilian deminers on comprehensive, humanitarian-focused removal.[47]

Demining and EOD tasks are done under the authority of the FC in coordination with the other UN entities, if present in the theatre, and when civilian, UN, or other international organizations are directly impacted (as opposed to purely military Force Protection tasks). The purpose of this coordination is to ensure information sharing and unity of effort.

Key tasks conducted by the MILENG Unit consist of demining and EOD in support of delivery of the mandate for the military component, in addition to providing technical training and assistance to supported units by providing demining and EOD support before and during search operations.

If demining is done in support of humanitarian mine action, the International Mine Action Standards (IMAS)[48] apply in coordination with the National Mine Action Authority. If demining is performed while in contact or under threat of contact with hostile forces, it is classified as a breaching operation and IMAS are not applicable.

2.5. Military Engineer associated tasks

Due to the constantly changing requirements for peacekeeping operations, but also in the course of the structural and organizational adjustments of the mission with regard to, for example, increasing technologization with the aim of reducing the human footprint or with regard to supporting the objectives of the UN sustainment development goals by making better use of existing resources[49] [50]. This includes, for example, the increasing use of renewable energy systems (e.g. PV solar, Eolic, etc.), which requires them to be installed, maintained and repaired.

Because of the nature of the tasks and the specific capacities and expertise of MILENG units, these have been assigned according to their task portfolio. As examples, two sub-units are listed below with their specialties, which will probably be found in all missions in the future.

MILENG units must adapt to these additional tasks accordingly. the best way to do this is to draw on experience reports from previous contingents, which can be made available as part of the organizational learning process[51] via the best practice officers in the missions.

An Integrated Force Mobility Team (IFMT) operates under the operational command of the UN mission headquarters, receiving directives and strategic goals from mission leadership.

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[47] The United Nations Interim Force in Lebanon (UNIFIL) serves as an exemplary model for managing the delicate balance between operational and humanitarian demining. In UNIFIL's operations, a "thin line" exists between these two types of demining, necessitating distinct Standard Operating Procedures (SOP) for each. Both procedures adhere strictly to the International Mine Action Standards (IMAS), ensuring safety and effectiveness. E.g., demined areas are declared safe for local security forces to operate within, but they are not officially handed following the established protocols from IMAS.

[48] See: https://www.mineactionstandards.org/

[49] See: Peacekeeping Mission Card - Reducing the Environmental Footprint of Field Missions

[50] See: https://www.ungsc.org/news/un-smart-camps-towards-smart-mission-unisfa-marks-new-milestone-inauguration-highway-smart

[51] See: Policy on Knowledge Management and Organizational Learning (DPO 2020.11/DPPA 2020.2)

Tasking for the IFMT comes directly from either the FHQ or DPO at UN Headquarters. These tasks involve strategic planning and coordination for mobility and logistics, encompassing the transportation and movement of troops, equipment, and supplies. In terms of reporting, the IFMT provides regular updates to the mission headquarters, focusing on operational logistics and mobility matters. Their reports, submitted consistently to ensure transparency and effective coordination, include detailed logistical assessments, movement plans, challenges encountered, and solutions implemented.

The Smart Camp Project Management Team (SCPMT) operates under the command of the mission support component within UN mission headquarters. Tasking for the SCPMT comes from either the UN mission headquarters or the UN Office of Supply Chain Management (OSCM). Their directives focus on designing, constructing, and managing smart camp infrastructure, with a strong emphasis on sustainability and efficiency. SCPMT reports to the mission headquarters on the status of camp projects, providing progress updates and addressing any issues encountered. Detailed reports are also submitted to UN Headquarters, particularly to the OSCM, outlining project timelines, resource utilization, and sustainability metrics. Regular feedback is provided to ensure that project objectives are aligned with strategic goals and sustainability standards.

2.6. Support to Mission Partners

In addition to Combat and Construction Engineering, as well as EOD, MILENG also provides a wider ranging capability in support to mission partners. Delegated by the HOM and under the Tasking Authority of the DMS/CMS, MILENG can support the UN Country Team (UN CT), host nation (HN) government, other UN agencies, funds, and programs as well as international organizations (IOs), including aid agencies and non-governmental organizations (NGOs) to facilitate their activities. This capability contributes to HN stabilization and overall safety and security, by supporting HN capacity building, Protection of Civilians (POC) and Disaster Relief. Usually, these MILENG activities have an immediate impact, improving local socio-economic activities and fostering the support of local population and mission partners the UN Mission.

Support to Mission partners involves mainly the tasks of horizontal and vertical construction, such as assistance in land development through earthworks, site preparation, structure and facility construction and repair, as well as LOC construction and repair.

Capacity building is done under the authority and direction of the Head of Mission/Special Representative of the Secretary-*General* and in compliance with the Human Rights Due Diligence Policy on UN support to non-UN security forces (HRDDP)[52]. These tasks may involve enhancing local skills and capabilities using a MILENG Unit's own expertise and equipment. When an Engineer Unit conducts capacity building activities for local residents, it is important to keep in mind that the construction skills taught should be appropriate to local needs, and eventually self-sustainable without a UN's presence. Respect for the local culture and a partnering attitude will be most successful.

Capacity building works hand-in-hand with construction support. For example, local nationals can be trained e.g., in engineers' skills, equipment and machinery handling, necessary to

[52] See: Human rights due diligence policy on United Nations support to non-United Nations security forces, S/2013/110

participate, in a meaningful way, in construction projects sponsored by the Mission. MILENG projects will also benefit the HN capacity building efforts as this will support e.g., FOM, POC and other mandated tasks. Capacity building require MILENG unit commanders and staff capable of conducting liaison, coordination and integration with the Mission's various civilian elements (e.g. Human Rights Component), Civil-Military Cooperation (CIMIC) Focal Point, UN funds, programs and agencies, international organizations, non-governmental organizations, the Host Nation's civilian security forces and local organizations.

While all elements of the Mission have a mandated responsibility to protect civilians in the mission area, the MILENG Unit has special capabilities to provide physical security, prevent harmful action by hostile forces and provide sanitary conditions to prevent spread of disease. These capabilities include e.g. earthworks, drainage and construction projects to prevent flooding and remove sewage; well drilling to provide clean water; and, in coordination with other stakeholders where available EOD and demining.

Where a Mission has a MILENG unit in a disaster-affected area, immediate disaster relief can commence, bolstering the UN's reputation as a positive influence in the lives of the local community. Combined with other support enabling capabilities such as communications, medical services, logistics, aviation, and transportation, the Mission can leverage heavy engineering equipment to clear and restore roads and other communication lines, carry out search and rescue operations, provide food, water, and shelter. Due to its well-established organization and command and control structure, the Mission can serve as a central hub and coordinating framework for relief efforts in the wake of a disaster.

3. Organization of the Military Engineer Unit

3.1. Organizing Principles

A MILENG Unit is normally considered a company-size unit. However, size and functions of the MILENG Unit will be defined by mission mandate, force requirements, troop ceiling and other factors, and could hence also be a platoon- or battalion-size unit. Every MILENG Unit includes elements organized according to function and equipment. Regardless of whether the Force or Mission requirement calls for a company or battalion-sized Military Engineer Unit, the organizing principles always apply.

The nature of a MILENG Unit is **modular** and **scalable**. Modular means that distinct types of specialized engineer elements can be added to the overall MILENG Unit. This usually happens during the consultation the TCC and the UN Secretariat during the force generation process to meet the unique requirements of each Mission.

Scalable means that the number of personnel and amount of equipment for every capability can be adjusted according to the requirements. Configuration will also depend on the prevailing security situation, operating environment (terrain, weather, surface soil and materials) and geographical dislocation of the unit in the AO (e.g., headquarter element, engineer elements and supporting elements).

Modular and scalable also means that a MIILENG unit can provide tailored subunits for operational agility and cohesive employment on specific tasks in the AO.

If possible TCCs are encouraged to deploy MILENG units with high-technology and state-of-the-art engineering equipment, to support the execution of tasks in the most effective way with the smallest possible footprint. All MILENG units, regardless of the availability of advanced technological equipment and machinery, should make continual efforts to include the latest, more effective, and efficient engineering methods and procedures.

MILENG units possess the capability to operate **independently** or integrate seamlessly into other units when assigned specific tasks. This **interoperability** extends beyond military forces to include cooperation with civilian engineers and various other entities. This applies in particularly for combat engineers and EOD specialists. Their **versatility** stems from the nature of their profession, which demands the ability to devise flexible and adaptive solutions to a wide array of challenges. Whether constructing infrastructure, clearing hazards, or supporting combat operations, MILENG units demonstrate a remarkable capacity to collaborate across different domains and deliver effective results in diverse situations.

Military Engineering (MILENG) units must be prepared to respond to requests with minimal notice, particularly during emergencies. This does not necessitate the establishment of a Quick Reaction Force; rather, it underscores the importance of ensuring the operational readiness of both personnel and equipment. This can be achieved through strategic foresight, systematic rotations, and adequate downtime management, in coordination with the Civilian Engineers.

Coordination of the force generation process with logistics planning is done when the TCC is selected by the UN Secretariat, Department of Peace Operations (DPO), Office of Military Affairs (OMA). Any challenges a TCC may face in equipping or supporting their contingents will be identified and addressed for solution at UN Headquarters. Problems are assessed based on a combination of the data provided by the TCC and assessments carried out by personnel from DPO and the Department of Operational Support (DOS).

The Status of Forces Agreement (**SOFA**) defines the legal rights of the UN Mission's personnel and operations. It may include terms of logistics support as well provided by the Host Nation to the UN Mission. DPO in coordination with DOS is responsible for negotiating SOFAs with the Host Nation, as well as Status of Mission agreements (SOMA).

The SOFA also codifies relations between the UN Mission and the Host Nation describing the rights, privileges and immunities of the Mission and its personnel and the Mission's obligations to the host government. SOFAs govern the legal status of troops and civilian personnel deployed to the Mission in the Host Nation, and specify the legal immunity for UN personnel with regard to the settlement of claims, the modalities for the exercise of civil and criminal jurisdiction over military and civilian Mission members, as well as provisions relating to FOM, taxes, customs, immigration controls, radio frequencies, flight clearances and permission to wear uniforms and carry weapons.

3.2. Personnel Requirements

MILENG units described and depicted in this manual are a recommended baseline for planning and preparation purposes at UN, TCC and Mission Headquarters. Actual personnel requirements and unit configurations will vary based on the Statement of Unit requirement (SUR), Mission requirements and MOU, signed by the UN and the respective TCC.

When generating an MILENG Unit, several aspects should be considered:

- Rank Structure. TCCs have the flexibility to adjust the rank structure through the MOU according to their national organizational norms. Nevertheless, TCCs must ensure that their personnel have the requisite ability and qualifications to execute the expected tasks.
- Female Participation. TCCs should make every effort to include uniformed female military personnel in the unit. Wherever possible, female personnel should be included amongst the command and staff, operations, logistics and interpreter personnel.
- Special Skills. Staff officers, technical and specialist personnel (such as engineers, search advisors, EOD personnel, surveyors, transportation specialists, interpreters, and medical personnel) should be fully qualified in their respective areas of specialization. EOD personnel are to comply with the UN Peacekeeping Missions Military Explosive Ordnance Disposal (EOD) Unit Manual[53] and relevant IMAS regulations[54];

[53] See: United Nations Peacekeeping Missions Military Explosive Ordnance Disposal (EOD) Unit Manual

[54] See: https://www.mineactionstandards.org

- Cross-Training. Military Engineers engage in cross-training to ensure that the operation of equipment and machinery is not reliant on individual personnel. This ach allows members to substitute for one another, guaranteeing that the unit can consistently fulfill its required tasks regardless of individual availability.
- Communications. All personnel within the units should be capable to communicate in English to support reporting of their actions and capable to operate the unit's communications equipment.[55]

3.3. Military Engineer Equipment

The Contingent Owned Equipment (**COE**) framework encompasses major equipment, personal protection equipment, ammunition, and explosives to enable the troops to protect themselves and carry out their mandated tasks.[56] The equipment is included in the Statement of Unit requirement (**SUR**) according to the operational tasks assigned to the unit. T/PCC are obliged to deploy personnel, major equipment, and self-sustainment pursuant to the signed **MOU**.

All major equipment and vehicles to support for MILENG unit is listed in the COE manual.[57]

Equipment not listed in the COE manual but deemed necessary by either party to the MOU may be agreed on during the negotiations. In this case reimbursement will follow the special case guidelines as described in the COE manual.

Demining and EOD equipment should perform in compliance with the relevant standards described in this Manual, and the IMAS.

To ensure that units being offered by TCCs come with the required capability, there are a number of options for the provision of major equipment and its support. The Manual explains different procedures and conditions under which units deploy, e.g., wet, and dry lease and or contracting method known as a Letter of Assist (**LOA**) for specific support requirements not already included under an MOU or available through a commercial contract, by which the UN acquires special supplies or services from a member state.

Annex B (Combat Engineers) and Annex C (Construction Engineers) enumerate the equipment requirements for a Combat Engineer, respective a Construction Engineer Unit of company size.

The are to read in conjunction with Annex D (MILENG recommended minimum capabilities), which provides a recommended minimum set of capabilities for planning and training purposes.

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[55] For missions in a francophone country, the predominant language of communication is likely to be French. Consequently, peacekeepers may be required to attain proficiency in French at a functional working level or alternatively, employ qualified translators to bridge any language barriers.

[56] See: Manual on Policies and Procedures concerning the Reimbursement and Control of Contingent-Owned Equipment of Troop/Police Contributors Participating in Peacekeeping Missions. The current version is available through the UN digital library system https://digitallibrary.un.org.

[57] See: Manual on Policies and Procedures concerning the Reimbursement and Control of Contingent-Owned Equipment of Troop/Police Contributors Participating in Peacekeeping Missions. The current version is available through the UN digital library system https://digitallibrary.un.org

The tables of recommended types and quantity of equipment were established based on typical Mission requirements, best practices, and extensive field experience. The define the basis and are for initial planning purposes only. They do not replace authorizations given in a SUR, the terms of an MOU, or as otherwise negotiated between the UN and TCC.

TCCs, who can provide MILENG with equipment of a higher standard or capability than that listed in the COE manual are encouraged to do so. Better protection, more capable engineering, EOD, or search assets, etc. all contribute to enhance the performance and safety of the personnel from MILENG units. By providing better equipment to the units, helping them to conduct their risky task, TCCs also contribute to employing this resource more effectively to implement the mandate and protect the civilian population.

3.4. Planning considerations

When determining the allocation of engineers, equipment, and training in a mission area, several critical and nuanced factors must be meticulously considered:

- **Needs Assessment:** Conduct an in-depth and thorough assessment of the mission area to identify specific needs and challenges. This includes evaluating the extent of infrastructure damage, understanding the security landscape, and gauging the capacity of local engineering resources. Engaging with local communities and stakeholders during this assessment ensures a comprehensive understanding of the operational environment and the specific needs on the ground.
- **Resource Availability:** Carefully evaluate the availability and adequacy of engineers, equipment, and training resources within the Mission and among local partners, including government agencies, NGOs, and private contractors. This assessment should consider not only the quantity but also the quality and suitability of these resources for the tasks at hand. Ensuring that all necessary resources are in place and ready to be deployed is crucial for the successful execution of tasks.
- **Priority Setting:** Establish clear priorities based on the potential impact of tasks on humanitarian assistance, stability, and long-term development goals. This involves prioritizing tasks that directly support the safety and well-being of civilians, such as repairing critical infrastructure, providing clean water, and ensuring safe transport routes. Prioritization should be guided by strategic objectives and the urgency of needs identified during the assessment phase.
- **Security Considerations:** Conduct a comprehensive assessment of the security situation in the mission area. This includes identifying potential threats to engineers and equipment, evaluating the overall safety of the operational environment, and ensuring that adequate security measures are in place. Security considerations should also include contingency planning for emergencies and the protection of both personnel and assets.
- **Equipment Suitability:** Evaluate the suitability of available equipment for the specific tasks and conditions of the mission area. This includes considering factors such as terrain, climate, and the state of local infrastructure. Ensuring that equipment is well-maintained, appropriately serviced, and suitable for the intended tasks minimizes downtime and enhances operational efficiency.

Deploying old generation equipment's can lead to increased fuel consumption and lower emission standards. The equipment offered to be deployed is to be critically reviewed during Pre-Deployment Visit (PDV)[58] and Assessment and Advisory Visits (AAV)[59]. TCCs are encouraged to deploy new generation equipment to enhance efficiency and environmental compliance.

- **Training Needs:** Identify specific training needs for both engineers and local stakeholders to enhance their skills and capacity. This includes providing tailored training programs in areas such as advanced construction techniques, mine clearance, disaster response, and project management. Addressing training needs ensures that personnel are well-prepared and capable of executing their tasks effectively.
- **Sustainability:** Emphasize the importance of sustainable development practices in all engineering tasks. This involves using locally available materials, adopting environmentally friendly construction methods, and engaging local communities in project planning and implementation. Sustainability considerations also include ensuring that projects are designed to be durable and maintainable in the long term.
- **Coordination and Collaboration:** Foster robust coordination and collaboration between all involved parties, including UN agencies, military forces, civilian contractors, and local authorities. Effective coordination helps to maximize the effectiveness of engineering efforts, avoid duplication of resources, and ensure that all activities are aligned with the overall mission objectives.
- **Community Engagement:** Actively engage with local communities, in coordination with civilian components of the mission, to ensure that engineering projects are responsive to their needs and priorities. This includes consulting with community leaders, incorporating local input into project planning, and promoting local ownership of initiatives. Community engagement contributes to long-term stability and resilience by ensuring that projects are relevant and beneficial to the local population.

By considering these factors, UN missions can strategically task engineers, allocate equipment, and provide training to address critical needs, support peacebuilding efforts, and contribute to the overall objectives of humanitarian assistance, reconstruction, and development in mission areas.

3.5. Structure of Military Engineer Units

MILENG units' organization described and depicted in this manual are a recommended baseline for planning and preparation purposes at UN, TCC and Mission Headquarters. Actual personnel requirements and unit configurations will vary based on the Statement of Unit Requirement (SUR), Mission requirements and MOU, signed by the UN and the respective TCC.

A MILENG unit is required of integrating attachments from other units, including incorporation into the unit's overall command, control and communications network and interoperability architecture.

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[58] See: Policy on Operational Readiness Preparation

[59] See: SOP on Planning and Conducting Assessment and Advisory Visits (AAVs)

See as well: United Nations Manual for the Generation and Deployment of Military and Formed Police Units to Peace Operations

3.5.1. Military Engineer Unit Command Element

The MILENG unit command element is responsible for coordination with the higher echelon:

- Force or Sector Headquarter (FHQ/SHQ), in particular U-8/G-8 MILENG and EODC
- with DMS/CMS and his/her designated subordinates such as the CSDM and Chief Engineer.

as well as of the unit's subordinate elements (Combat and Construction Engineer elements, EOD teams and other force components) to ensure taskings are executed effectively and efficiently in an integrated manner.

The unit commander should be assisted by a second-in-command/Executive Officer (2IC/XO), to ensure exercise of Command-and-Control 24/7 and supported by a Senior Non-Commissioned Officer (SNCO) or Junior Commissioned/Warrant Officer.

The MILENG unit command element has the following responsibilities:

- Support and advice the higher echelon (FHQ/SHQ) in the preparation of orders and taskings regarding MILENG capabilities, limitations, timelines, and procedures, etc.
- Request required support for MILENG taskings, including attachments of supporting units, provision of material/supply, etc.
- Ensure continued operational readiness of personnel and vehicles/machinery, including planification of necessary reserves in case of emerging situation in accordance with the mission operating environment.
- Coordination with all relevant staff departments to support the employment of the MILENG unit.
- Coordinate with all relevant staff entities to ensure situational awareness (SA) of the operational environment (weather, terrain, etc.) as well as existing threats and trends (e.g., EO and IEDs, etc.)
- Acquire, processing, analyzing (including the use of early warning indicators) and communicating tactical information to the subunits.
- Processing of information down- and upstream (Reports & returns) to ensure proper, timely and accurate reporting, including monitoring of the relevant communication systems.
- Ensure the necessary training to maintain qualifications of the MILENG subunits.
- Implementing best practices in coordination with the relevant staff departments (U-8 / G-8, Best Practice, etc.) by applying them to own units and by sharing relevant work results for application by other units.

Illustration 3.1. depicts a generic structure of the MILENG unit command element. Details are to be negotiated between the TCC and the UN HQ upon selection of the unit.

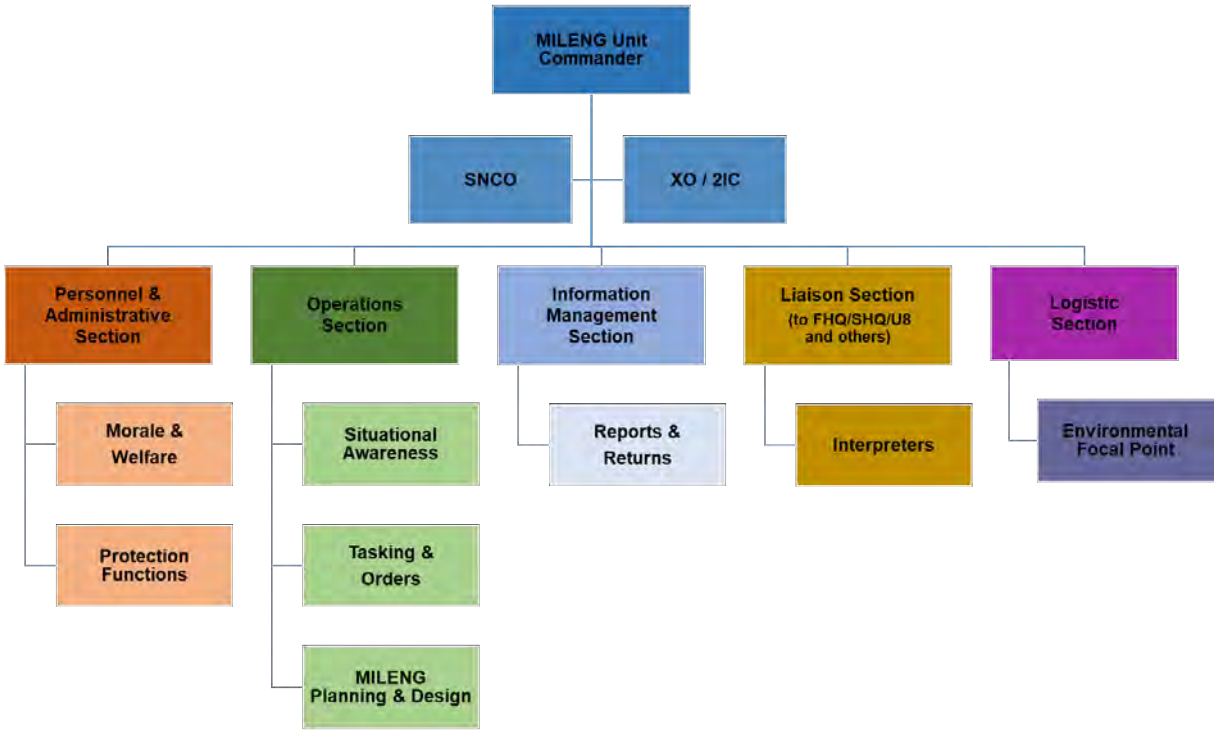

Figure 3-1: Generic structure of MILENG unit common element

The MILENG unit command element should include a **personnel and administrative section**, with qualified personnel for the respective matters (Human Resources/HR), including moral & welfare, as well supervising compliance with UN standards regarding sexual exploitations and abuse (SEA) and other UN core principles.

The **operations section**, led by the MILENG Operations Officer, coordinates the functions of all staff sections that are responsible for planning, organizing, staffing, directing, controlling, and sustaining all operations and administrative responsibilities of the unit in accordance with unit and Force standard operating procedures.

The operation section is to include a MILENG Planning and design element that performs the task of developing long-term plans in terms of “future plans”. In the case of Construction Engineers this includes supporting the civilian engineers in the design of projects by creating a project plan that considers all essential planning parameters (e.g. estimated project duration, project schedule/implementation plan, technical specifications/Standards, international and local design standards, Bill of Quantities (BOQs), etc.).[60] These plans are to be consulted and cleared by Civilian Engineers and subsequently handed over and used by the MILENG platoons as a basis when implementing the taskings.

The section coordinates all operational activities and movements within the area of responsibility, maintains the MILENG Unit’s 24/7 Operations Center and maintains liaison with the higher echelon (including U-8 / MILENG, CSDM, ES/EFMS), as well as adjacent units.

[60] See: DOS Engineering Support Manual for Field Missions

The unit command should incorporate an **information management section** responsible for overseeing all communication devices. This section would ensure the accuracy, completeness, coherence, and timeliness of communications, and guarantee that all necessary reports and returns are processed appropriately.

The MILENG unit command element is also to dispose a **liaison or engagement section**, capable to conduct engagement with the local population, including women's groups and other civilian society actors, through well-coordinated and resourced CIMIC[61], welfare activities, gender-sensitive Quick Impact Projects (QIP) and support to humanitarian operations (if requested by the Humanitarian Country Team through the Resident/Humanitarian Coordinator (RC/HC)). The Engagement Staff Section includes an engagement/public information officer and interpreters. It coordinates with the Force/Sector U-9 and other Mission components and undertakes appropriate engagement activities with the local population through confidence-building measures, community projects, civil-military cooperation/quick impact projects (CIMIC/QIP), welfare activities, public information, media management and key leader engagement. It employs its own interpreters in conjunction with local interpreters. It operates in close coordination with the Mission's civilian components, such as Civil Affairs and Human Rights, liaising with the humanitarian agencies and local stakeholders, including Host Nation security forces, applying the principles detailed in the United Nations Engagement Platoon Handbook, including assessment of risk and threat to civilians caused by military operations, and the potential for reprisal against those engaging or cooperating with the Mission.

Further the command unit elements integrate a **logistics section**, composed of a Logistics Officer, logistics staff and a contingent-owned equipment (COE)/finance officer. The section coordinates logistics and cross-functional support for the unit in accordance with MOU arrangements to plan, provision, stock, and turnover inventory; replenish supplies and stores; and repair, replace and manage equipment. The section ensures timely maintenance, serviceability, and inspection of both contingent-owned and UN equipment in the unit's care. It also manages the unit's financial and accounting transactions. The Logistics Officer is in charge of the Engineer Unit's movement control for in-Mission movement as well as unit rotations and acts as the **environmental focal point**.

3.5.2. Military Engineer Support Platoon

The Engineer Support Platoon facilitates and enhances all engineering operations through the provision of specialized centralized services. This platoon is composed of multiple sections, each tailored to address specific engineering needs.

[61] All activities must follow the policy for Civil-Military Coordination in UN Integrated Peacekeeping Missions (UN-CIMIC policy), and it is essential to ensure that they meet the requirements of the mission.
See: Policy on Civil-Military Coordination in UN Integrated Peacekeeping Missions (UN-CIMIC)

The MILENG support platoon, operates under the logistics section of the MILENG unit command element. It includes:

- Communication Section,
- Supply and Petroleum, Oil and Lubricant (POL) Section,
- Transportation Section,
- Maintenance and Workshop Section
- Geographic Information System (GIS) support section

Depending on the Mission requirements the support platoon might be amended by the following sections:

- Catering Services Section
- Facilities Management Section
- Level I Medical Facility
- Well Drilling Section
- Camp Guard Section

The individual elements can be organized as needed in a logistic support platoon and a MILENG support platoon, task organized and tailored to the mission requirements, when the strength of the subunit significantly exceeds the size of a platoon. However, in terms of a central request for support services, the combination in one platoon is prioritized.

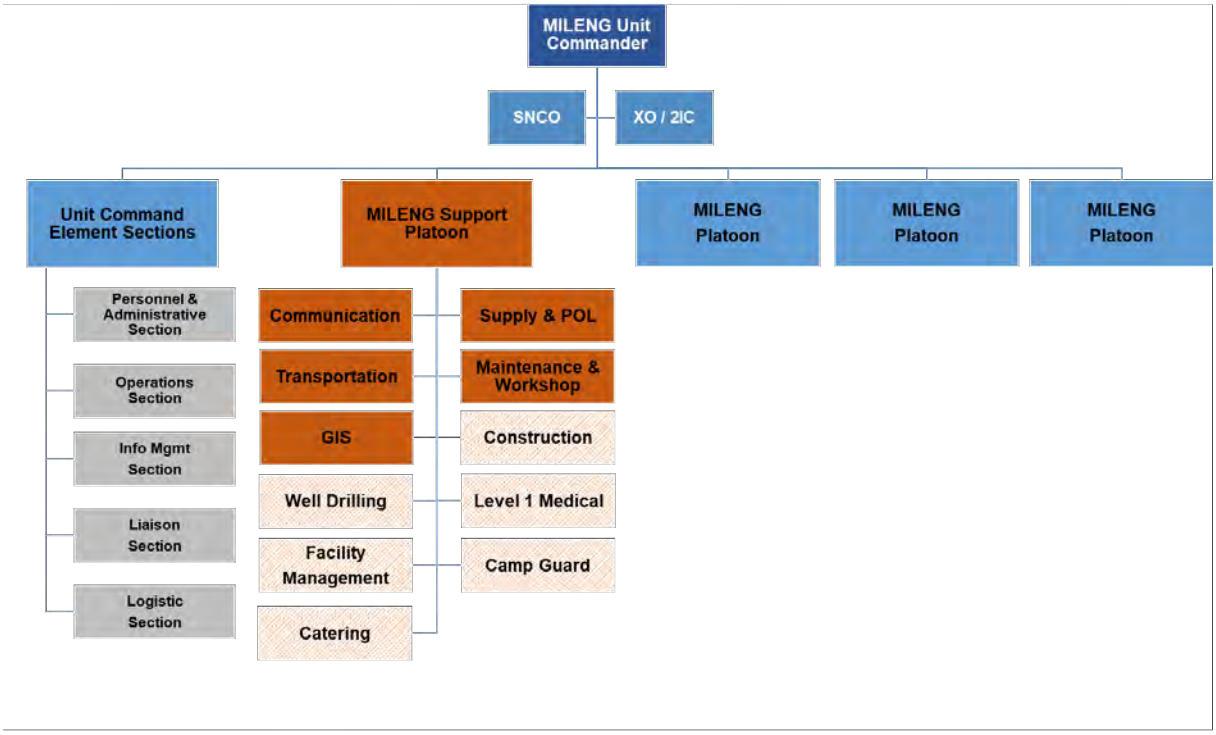

Figure 3-2: Generic structure of MILENG unit common element with Support Platoon

The Maintenance and Workshop Section is dedicated to the upkeep and repair of engineering equipment, ensuring that all machinery and tools are operational and in optimal working condition.

The section responsible for Geographic Information System (GIS) support, which offers expertise in various domains such as geology, topography, and related fields. This section is equipped with professionals capable of conducting detailed surveys and providing crucial data to inform engineering decisions.

Within a Combat Engineer Unit, the Engineer Support Platoon is further enhanced by the inclusion of Construction Sections. These sections are staffed with personnel possessing advanced construction knowledge and skills, enabling them to assist combat engineers in the execution of their missions. This integration ensures that combat engineers are supported with precise construction expertise, facilitating the successful completion of their tasks, and enhancing overall operational effectiveness.

When mission parameters necessitate, the Engineer Support Platoon can be augmented with a Well Drilling Section, tasked with the location and development of water resources, thereby ensuring sustainability and support in diverse operational environments.

If the MILENG unit is expected to deploy subunits to support operations in remote operating bases (e.g., Temporary Operating Bases/TOBs) there might a requirement for an independent Level I Medical Facility, specialized in the possible medical treatment required in relation to MILENG activities. For all aspects concerning equipment, reimbursement, etc. the COE manual[62] is equally applicable.

If the MILENG unit is deployed independently there might a requirement to provide own protection of the camp facility by a camp guard element. The camp guard element is responsible to maintain the unit's camp physical security regarding any potential threat, as well as the safety of the facility, including the capability to conduct firefighting and, if the Mission requires, providing response to a potential hazardous materials (HAZMAT) threat.

In particular, when MILENG execute operations in remote or sensitive areas—whether in direct support of mission partners or in proximity to local communities—incorporating an engagement platoon (EP) or team (ET) should be seriously considered. The engagement function, designed to enhance situational awareness, foster relations with host governments, conflict parties, and other mission partners, and facilitate cooperative information-sharing, is typically assigned to infantry battalions in the form of an EP/ET.[63]

However, there are scenarios where equipping MILENG with these engagement capabilities is both advantageous and strategically sound. This integration can be achieved through various approaches. One option is to coordinate with the TCC to incorporate an EP/ET

[62] See: Manual on Policies and Procedures concerning the Reimbursement and Control of Contingent-Owned Equipment of Troop/Police Contributors Participating in Peacekeeping Missions. The current version is available through the UN digital library system https://digitallibrary.un.org.

According to the COE manual "The level 1 unit must be able to split into two forward medical teams. All equipment must be portable."

[63] See: United Nations Engagement Platoon Handbook

directly within the military engineering unit. Alternatively, an EP/ET can be detached from an infantry battalion in the area of operations (AO), ensuring that these capabilities are temporarily available to the MILENG unit on the ground.

3.5.3. Military Combat Engineer Unit

A Combat Engineer unit, usually a company sized unit, typically includes several key elements to ensure a full range of combat engineering and explosive ordnance disposal capabilities. At the core of this structure is the Unit Command Element, which oversees the entire company. This element includes a Logistic Section responsible for managing logistics and incorporating the MILENG Support Platoon.

The MILENG Support Platoon, plays a crucial role in maintaining the operational readiness of the Combat Engineer Platoons. It provides necessary logistical and technical support, ensuring that the Combat Engineer as well as the EOD Platoon can perform their tasks effectively.

Each Combat Engineer Platoon, usually two per company, is the nucleus of all combat engineering activities and tasks. A typical platoon includes a command element that coordinates activities and ensures effective communication and command. The platoon comprises two Combat Engineer Sections that handle core engineering tasks as described in chapter 2.1.

Additionally, a Force Protection (FP) Section, equipped with Armored Personnel Carriers (APCs), ensures the platoon's mobility and protection, focusing on security during operations.

Every Combat Engineer Unit also includes an Explosive Ordnance Disposal (EOD) Platoon. This platoon is vital for handling and disposing of explosive threats within the AO. Depending on the threat level, the EOD Platoon may consist of several Conventional Munition Disposal (CMD) or IEDD teams. These teams are equipped with the necessary expertise and skill sets, as defined in the UN EOD Unit Manual, to handle a variety of explosive devices, up to and including chemical, biological, radiological, and nuclear (CBRN) explosives, if required. The parameters to define the required mix of teams and levels of qualifications are provided in the UN EOD Unit Manual.

The EOD Platoon Commander has the critical responsibility of coordinating medical and FP support for EOD operations. If the Combat Engineer Unit cannot provide the necessary support due to limitations of the TCC or other factors, the EOD Platoon must request support through the command unit element to higher headquarters.

The EOD Platoon operates under the direction of the Explosive Ordnance Disposal Center (EODC), which tasks them in accordance with the EOD Unit Manual. Depending on the mission’s organization, the EOD Platoon may need to dispatch qualified personnel to support the EODC at the Sector Headquarter (SHQ) or Force Headquarter (FHQ) level.

Requests for EOD assistance can originate from various sources, including the UN Force, the mission's civilian component, or local authorities who submit their requests to the UN Mission. These requests are typically approved when there is a direct and imminent threat to UN personnel or installations, threats to civilians, hindrances to the accomplishment of UN tasks, or directives from higher command. All EOD activities are subject to dedicated reporting requirements as outlined in the EOD Unit Manual.

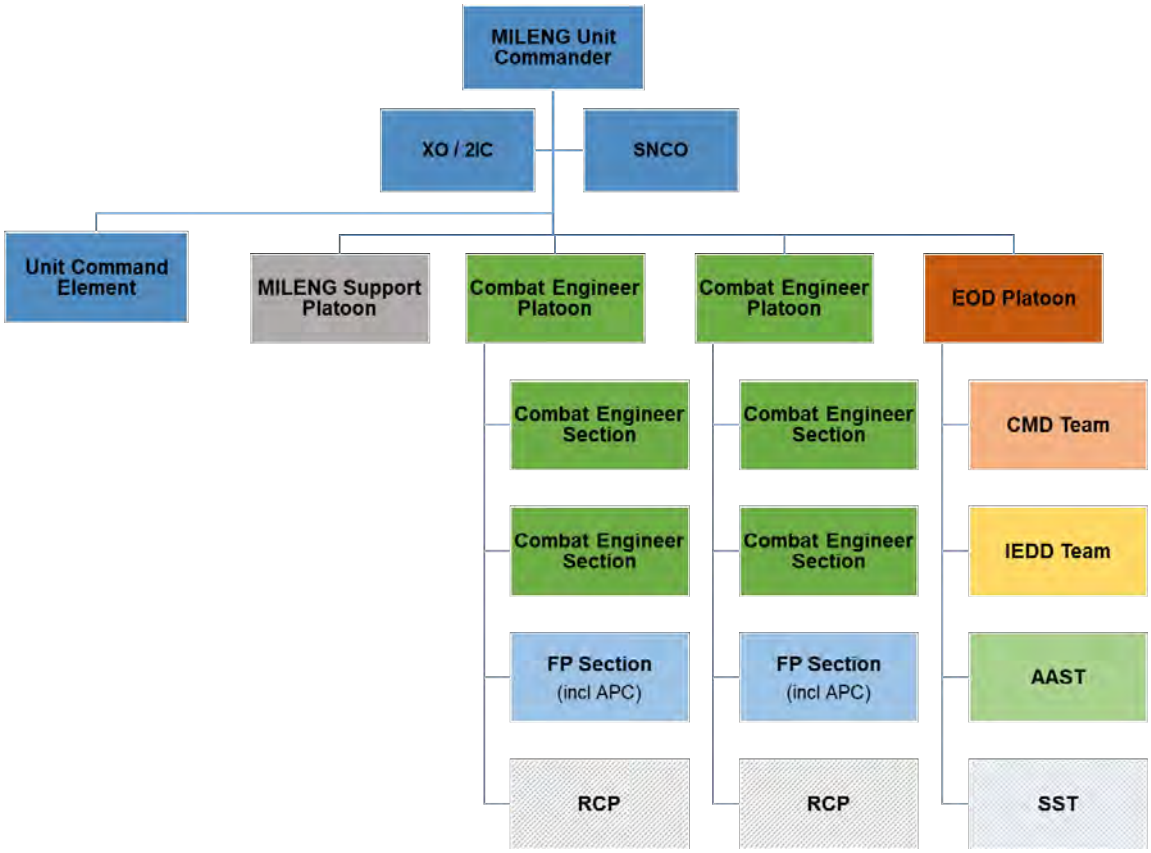

Figure 3-3: Generic structure of MILENG Combat Engineer unit

The structure of a Combat Engineer Unit is designed to be modular and scalable, based on the SUR, force, and mission requirements, as well as the capabilities of the TCC. This flexibility ensures that the unit can effectively perform a wide range of engineering and EOD tasks, providing essential support to UN missions while maintaining operational flexibility and security.

Annex B enumerates the Equipment Requirements for a Combat Engineer Units, derived from extensive operational experience. These recommendations must be meticulously assessed and validated prior to each mission, considering the specific tasks, mission environment, and prevailing threats.

For comprehensive planning, the list in Annex B should be examined alongside **Annex D** providing recommended minimum MILENG capabilities detailed in. This combined study provides robust planning parameters, ensuring the necessary capacities are allocated for the operation. Both annexes are integral to the planning process.

3.5.4. Military Construction Engineer Unit

A Construction Engineer unit, typically a company-sized unit, typically includes several key elements to ensure a full range of construction engineering. At the core of this structure is the Unit Command Element, which oversees the entire company. This element includes a Logistic Section responsible for managing logistics and incorporating the MILENG Support Platoon.

The MILENG Support Platoon, provides specialized expertise and ensuring the operational readiness of the Combat Engineer Platoons. It delivers logistical and technical support, empowering construction engineers with the resources and capabilities requisite for executing their tasks.

The unit further consists of a Horizontal and Vertical Construction Platoon, possibly subdivided into respective sections.

Depending on the exigencies of the mission, the unit may also include a dedicated Road and Airfield Platoons. The Road Platoon is usually tasked with the construction and maintenance of (asphalted) roads, thereby securing robust transportation networks, and on the construction and upkeep of airfield facilities, essential for the operation of diverse air assets. This platoon's capabilities can be extended to maritime operations, constructing harbors, mooring areas, launching and recovery sites, and other maritime infrastructure critical to the operational efficacy of maritime assets, if required

To ensure the standards of all constructions and adherence to specifications, the unit includes a Technical Inspection Team. This team is responsible for prioritizing construction tasks, monitoring progress, and conducting final inspections to confirm that all requirements are satisfied before facilities are rendered operational.

In Missions where the threat assessment necessitates, the unit may be augmented with an EOD Platoon. This platoon ensures the safety of construction activities, by screening and sweeping construction sites for explosive devices and neutralizing any identified threats. The integration of an EOD Platoon adheres to the same operational principles as described for the combat engineer unit.

Construction Engineer units are required to provide their own FP, including the use of personal and crew-served weapons, as well as a logistic support element capable of supporting several platoon-size elements simultaneously in various locations. Additionally, they may be required to provide water treatment and purification capabilities in support of other Mission personnel/units including well drilling.

Annex C enumerates the Equipment Requirements for a Construction Engineer Units, derived from extensive operational experience. These recommendations must be meticulously assessed and validated prior to each mission, considering the specific tasks, mission environment, and prevailing threats.

For comprehensive planning, the list in Annex B should be examined alongside **Annex D** providing recommended minimum MILENG capabilities detailed in. This combined study provides robust planning parameters, ensuring the necessary capacities are allocated for the operation. Both annexes are integral to the planning process.

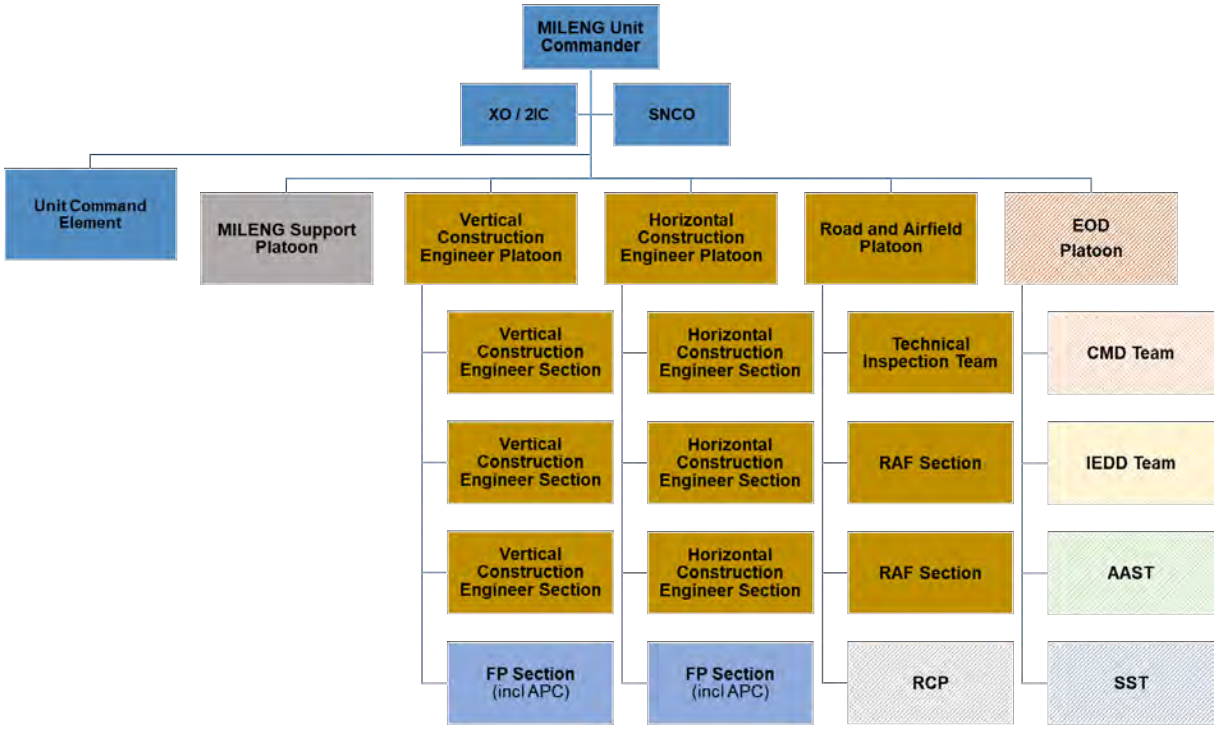

Figure 3-4: Generic structure of MILENG Construction Engineer unit

3.5.5. All Arms Search Teams (AAST)

Military search in its broadest terms can be broken down into all arms search capabilities and specialist search capabilities.

All Arms Search. Search capabilities employed by non-specialist members of a unit. There are various levels of all arms search capabilities.

Specialist Search. Search capabilities employed by advanced search personnel trained, equipped, and qualified to do so. Information regarding Specialist Search is contained in the UN Military Engineer Unit Manual.

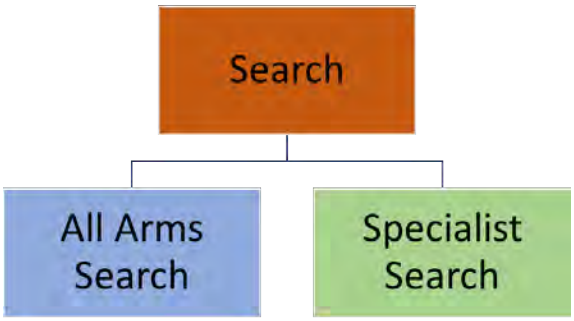

Figure 3-5: Search Capabilities (1)

Within All Arms Search there are three levels of search capability, namely:

- Basic Search
- Route Search and
- Intermediate Search

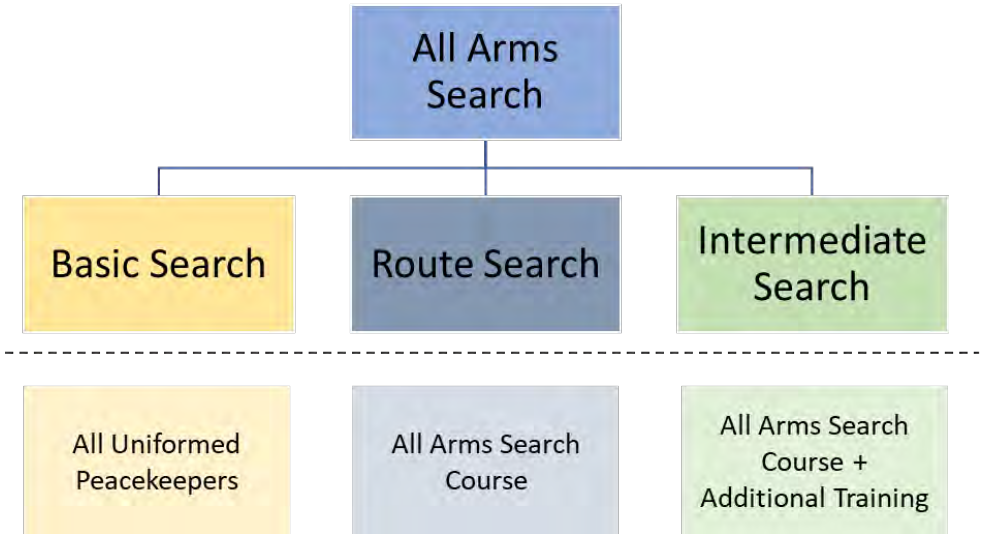

Figure 3-6: Search Capabilities (2)

Every uniformed peacekeeper is to be qualified to conduct Basic Search.

Personnel with additional participation in an AAST-Course All Arms Search Team (AAST), qualified to conduct Route Search or even Intermediate Search.[64]

AAST are expected to support the movement of the own unit by providing the required expertise to conduct a route search. Route Search refers to a "mobility unit" level, All Arms Search, capability used to check assessed Vulnerable Points (VPs)[65] and Vulnerable Areas (VAs) along a route of travel for the presence or absence EO, especially IEDs. It involves knowledge and skills to assess a VP or VA and determine how best they should be secured and searched to locate and isolate suspected IEDs so they can be identified, marked, confirmed, and rendered safe by EOD / IEDD Operators or other suitably qualified personnel.

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[64] See: UN IED Threat Mitigation Handbook

Intermediate Search: Undertake all basic and route search tasks in line with HEAT factors with key additional capabilities of intermediate search being area search and building search. An increased level of training and specialist equipment is required at this level of capability compared to route search and basic search. Area search involves the systematic search of a target area with the aim of locating items that have been, lost, misplaced, discarded, or hidden.

[65] See: United Nations IED Threat Mitigation Handbook

A Vulnerable Point (VP) is a specific point where it is particularly advantageous to target friendly forces with an IED and/or Small Arms Light Weapons (SALW), ambush or both. They are typically characterized by prominent or restrictive feature, as e.g., limitation of speed, movement, or visibility due to terrain, or choke point on the ground. They could as well be based on patterns established by peacekeepers, using the same entry to camps, patrolling the same roads and villages, using the same lookout, etc.
Vulnerable Areas (VA) are those areas where the ground lends itself to IED or SALW attack.

All Arms Search Teams (AAST) are comprised of trained searchers, equipped with precision search equipment and ECM, capable of conducting basic search procedures. All AAST members deploying to the mission should undergo pre-deployment training on the following:

- IEDs and their threats and methods of attack.
- Ground sign awareness.
- Conduct of VP/VA.
- Conduct of person and vehicle search drills and procedures.
- Apply physical FP measures.
- Apply reporting responsibility.
- Support technical exploitation (e.g., collection of evidence, etc.)
- Conduct “actions-on” drills (action on IED strike/ Incident management e.g., contact explosion, casualty).
- Operation of Search equipment
- Understanding and employing ECM.

Military Engineers, in particular combat engineer units and horizontal construction engineers, as well as road and airfield construction engineers, are categorized as mobility units. To support their own movement and ensure the execution of their task, they are mandated to dispose of an All-Arms Search Teams (AAST).

As part of the Specialized Training Material (STM) for United Nations Infantry Battalions, Annex E, the Peacekeeping Resource Hub provide material for the All-Arms Search Course (AASC).[66]

3.5.6. Specialized Search Team (SST)

In addition to the AASTs, which are mandatory for every mobility unit and must also be planned accordingly in the respective engineer units, MILENG units also have specialized search teams (SST).

SST are comprised of trained searchers, equipped with precision search equipment and ECM, capable of conducting all types of intermediate search plus advanced search.

Advanced search is the capability to conduct search operations in an area where; the operating environment is assessed to be non-permissive, there is a high threat[67], only the highest level of assurance is acceptable, or a hazardous environment exists. It invariably requires support, FP, and additional specialized equipment. Advanced Search capabilities include:

- **Protective Building Search.** A type of search operation conducted in buildings which are assessed as requiring detailed search operations prior to a major event or VIP visit. It is intended to provide a safe environment from an assessed threat. Pre-emptive

[66] See: Peacekeeping Resource Hub, STM for UN Infantry Battalions, Annex E

https://peacekeepingresourcehub.un.org/en/training/functional

[67] Activities undertaken where the assessed risk posed by specified threats is assessed as probable. For example, where specific U2 indicates the presence of emplaced IEDs.

building searches are complex, resource intensive operations that require careful planning and control by a search advisor.

- **Aircraft Search.** The search of an aircraft for the presence of threats.
- **Vessel Search.** The search of moored riverine and maritime platforms not underway for the presence of threats.
- **Hazardous Environment Search.** Any search activity with an environment that involves Working in Confined Spaces (WICS)[68] and or a toxic environment requiring specialist access or breathing equipment and or Working at Heights (WAH) or working within or alongside unstable structures[69];
- **Secondary Vehicle Search.** A detailed systematic advanced search of a vehicle involving the search of voids and interiors of compartments within a vehicle using specialist techniques and equipment and can be conducted with assistance from target vehicle experts.

SSTs, like AASTs, work closely with EOD teams. While it is not imperative for them to belong to the same unit, it is advantageous if MILENG provides EOD teams from the same unit. This facilitates coordinated procedures and joint training before missions, thereby minimizing operational risk during specialist searches in non-permissive environments.

Considering the broad spectrum of capabilities, it is unrealistic to assume that an SST can execute all types of specialist searches. Therefore, it is essential to define the anticipated scenarios in advance of deployment to ensure that suitably qualified personnel and appropriate equipment are available.

3.5.7. Search Advisor

The Search Team Commander of an AAST or an SST, commands the team, co-ordinates with other agencies, and works in close coordination with the Search Advisor.

Search Advisors are specialist staff at all levels of command, who provide advice and assist in planning of search related activities. The Search Advisor must be current on all relevant policies and doctrines to ensure that they provide the right advice to the FC, Sector or Unit commander they report to, as well as their staff on all search-related matters.

[68] A confined space is any place, including any chamber, tank, vat, silo, trench, and pipe or similar, where there arises a reasonably foreseeable risk. It may include structures and the holds of ships where there are risks from lack of oxygen, poisonous gas, fumes or vapors, movement of liquids or solids, fire or explosion, dust, or heat. Confined spaces may be surface or subsurface/subterranean.

[69] Unstable structures include damaged, poorly maintained or poorly designed structures and buildings that may be encountered in an operational theatre; they may be buildings or equipment. Unstable structures may include poorly stacked materials or equipment such as ISO storage containers or structures that are sited on inadequate foundations. The risks are from collapse or movement of the structure causing crushing or entrapment and from the risk of falling materials or objects.

As a minimum there should be a Search Advisor at the FHQ level. Under certain circumstances, the role can be double headed: Performing the tasks of the IED TM Advisor and the Search Advisor. More details regarding a Search Advisor are provided in the UN IED Threat Mitigation Handbook.[70]

3.5.8. Road Clearance Package

In comparison to Route Search (see chapter 3.5.5.), Route Clearance refers to a deliberate operation by a dedicated, task organized unit to identify and dispose of IED threats along a specified route to provide freedom of movement to friendly forces and the civilian population. Route Clearance is a capability which that is usually provided by Military Engineers only.

Route Clearance searches the entire route with a detailed search of high-risk areas. This operation requires specialized detection, interrogation, and proofing equipment to identify and remove IEDs. It may also include engineer construction equipment to eliminate places to conceal IEDs (potholes, culverts) or reduce cover and concealment along the sides of the route.

Examples of the use of such assets may be to:

- Clear the vegetation and scrub around junctions which are assessed VP.
- Improve and secure culverts to prevent their use as IED emplacement locations.
- Use of such assets to improve the road surface to hinder IED emplacement along it.
- Improve mobility and enhance Freedom of Movement (FOM).

Additional FP elements may also be included to provide overwatch or secure VAs/VPs to prevent the replacement of cleared IEDs until after a critical convoy has passed.

A Route Clearance Package (RCP) is the combination of FP assets, search and EOD capabilities which are threat aligned and within available resources to clear a defined route to a determined standard.

It is the task organization within the mission of dedicated route clearance assets and associated teams to assist with route management in an explosive threat environment. Such dedicated units within an all-arms grouping can, if large enough, be a standalone mission asset or alternatively can be a platoon or larger element within an UN engineer unit. RCP can be equipped with a mix of general and specialist vehicles, equipment and personnel integrated to conduct route clearance. Their purpose is to eliminate concealment for IEDs, munitions and caches as well as providing systematic detection and deterrence sweeps along cleared routes. An RCP can be used in general support to maintain main supply routes and in close support providing support to UN units on tactical road movements.

As an example: A task organized Route Clearance package consisting of Engineers, EOD, and Security is tasked to clear a route ahead of a high value convoy. They search the entire route, identifying, interrogating, and disposing off any explosive hazards using their internal EOD assets.

Search capabilities (Intermediate and Specialized) can contribute to route clearance operations by means of Area and Route Search procedures.

[70] See: UN IED Threat Mitigation Handbook

A Temporary Composite Route Clearance Packages (TCRCP) is an asset for an operation to establish a cleared route assembling the required assets at the start of a mission or when an IED threat emerges and then standing it down when their assigned task(s) is completed. This would typically involve the forming of a composite unit or RCP normally around combat engineering assets. This can be a very efficient use of resources and personnel.

However, once stood down it is possible that continual route maintenance will be required to keep the routes in a state that mitigates the threat of IEDs, and repair damages caused through the continued use of IEDs along them.

3.5.9. Special Purpose Engineer Unit

UN peacekeeping missions are facing increasing challenges due to severe weather phenomena, which are direct consequences of climate change. Flooding, in particular, presents a critical obstacle, significantly hindering the UN's ability to conduct patrols, maintain a visible presence, ensure ceasefires are upheld, and protect civilians effectively. This evolving climate landscape necessitates the deployment of military engineers with specialized skills to mitigate these challenges. Future requirements may include advanced bridge-laying capabilities, ferry services utilizing pontoons or bridge elements, and heavy machinery for constructing and maintaining dams. Additionally, pumping units will be essential for draining flooded UN facilities and refugee camps, ensuring operational continuity and safety for displaced populations.

Currently, no standardized operational requirements or generic SUR exist for these specialized capabilities, necessitating the development of ad hoc solutions tailored to specific mission needs. Therefore, TCCs are encouraged to proactively develop, train, and prepare MILENG units capable of providing these critical services. By doing so, they will be better equipped to support UN missions in increasingly adverse environmental conditions, ensuring mission success and the safety of both peacekeepers and civilians.

3.5.10. Military Composite Engineer Unit

The Composite Engineer Unit encompasses a comprehensive range of MILENG capabilities, including a unit command element and a MILENG Support Platoon, with its specific composition tailored to mission requirements. Typically, it includes a Combat Engineer Platoon and a Construction Engineer Platoon, which consists of specialized sections such as Horizontal, Vertical, and Road and Airfield Sections. An EOD Platoon could also be integral to this unit. Additionally, AASTs are considered a fundamental component of the mobility elements within the Composite Engineer Unit and can be further reinforced with SSTs and a Road Clearance Package.

The composition and size of the Composite Engineer Unit are modular and scalable, allowing for flexibility based on force and mission requirements and the capabilities of TCCs.

Due to the diverse tasking and reporting procedures—such as EOD elements reporting to the EODC and Construction Engineers reporting to the DMS/CMS it is advisable to consider enhancing the unit command element. This enhancement would ensure the unit can effectively manage all requirements while also providing adequate representation in FHQ/SHQ. This structuring and reinforcement enable the Composite Engineer Unit to adapt dynamically to varied operational demands, ensuring efficient and effective mission support.

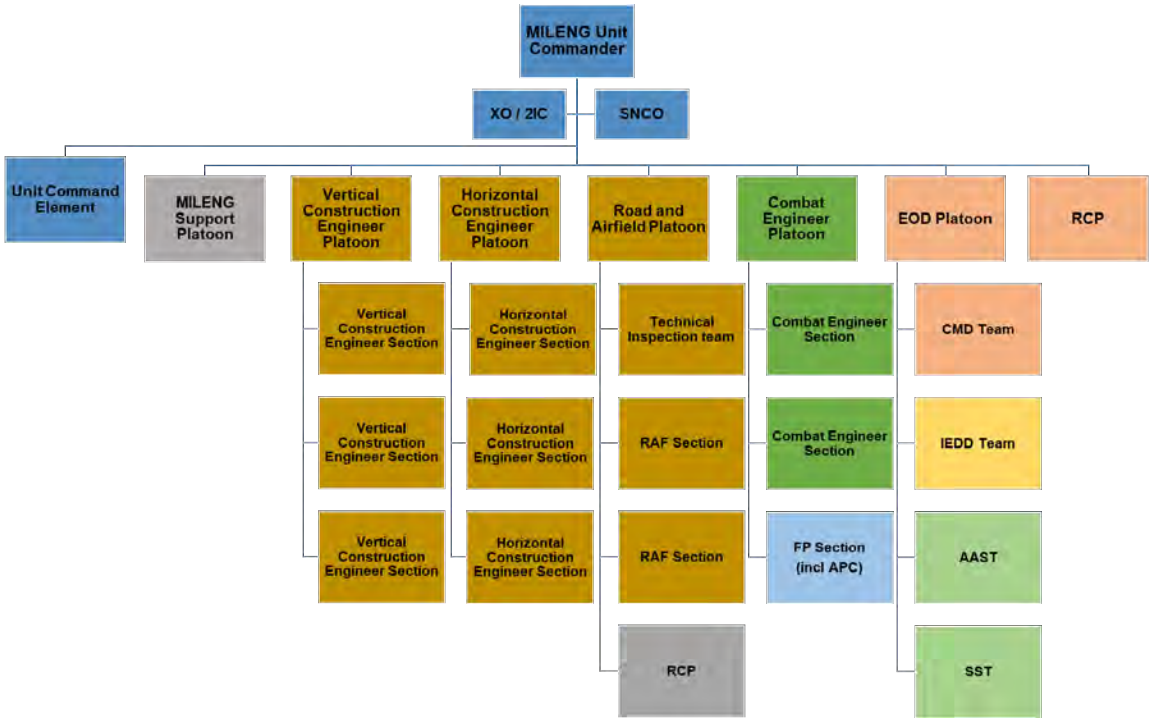

Figure 3-7: Generic structure of MILENG Composite Engineer unit

As an example, a Mission could deploy a Composite engineer Unit as part of a larger Joint Engineer Task Force (JETF) comprising military engineers, civilian engineers, local civilian engineers, and UN contracted civil agencies in a conflict-affected region to facilitate humanitarian assistance, reconstruction, and in support of stability operations.

Their tasks may include rebuilding infrastructure such as roads, bridges, and public buildings; demining to ensure safety; restoring water and sanitation systems; constructing shelters; and capacity building through training local engineers and laborers.

The JETF would operate under the UN HOM authority, ensuring strategic resource allocation and coordination. Effective communication channels and liaison officers facilitate cooperation between the JETF, local authorities, NGOs, and stakeholders, while the flexible command structure adapts to changing circumstances, maximizing efficiency and response to emerging challenges. This collaborative effort leverages diverse expertise and resources, significantly contributing to peacebuilding and long-term recovery in the region.

3.5.11. Embedded Military Engineer Units

In addition to independent MILENG units, there are also embedded MILENG units, e.g., in infantry battalions, etc. These units directly support the activities of the respective unit. They are under the “UN operational command and control” of the respective unit commander and operates under the Operations Staff Section of the respective unit.

As a rule, these MILENG units, usually platoon-size, have a wide range of capabilities and cannot be categorized as combat or construction engineers, but rather as a composite unit. It provides and coordinates field engineering support to all TOBs and OPs, provides and maintains water supply and waste water treatment systems, sets up solid waste (including hazardous) segregation areas, manages and provides electricity (static and generator based, including containment basins), maintenance of accommodation and allied infrastructure, provides EOD capability, emergency mine, IED and unexploded ordnance (UXO) clearance, and provides engineering assistance to CIMIC/welfare activities as part of engagement. The commander of the embedded MILENG unit will also act as “Engineer Adviser” to the superior commander, e.g. the Battalion Commander.

The same relationships apply for embedded MILENG units as for independent MILENG units. EOD teams within the MILENG units are tasked by the EODC, while construction engineers are tasked by DMS/CMS.

4. Support to Military Engineer Unit

All necessary procedures to follow to prepare and enable the deployment of an MILENG unit are specified in the following guidance/documents:

- United Nations Manual for the Generation and Deployment of Military and Formed Police Units to Peace Operations[71]
- TCC Generic Guidelines for Deploying Military Units to UN Peacekeeping Missions[72], including logistical support for units.

A possible deployment of a MILENG unit for a mission is initiated by the pledge of the TCC. With the successful selection of the unit all necessary coordination of the force generation process with the corresponding logistics planning.

At this point, any problems, the TCC may face in equipping or supporting their contingents are identified and staffed for resolution at UN Headquarters. Problems are assessed based on a combination of the data given by the TCC and assessments carried out by DPO and DOS, recognizing that TCCs may not possess all the equipment needed for a particular UN Mission. The possible solution is negotiated between the TCC and DPO/DOS to mitigate the shortcoming through logistical arrangements, as outlined in the COE Manual.

The MILENG Unit is mandated to meet self-sustainment standards as outlined in SUR, the MOU between the UN and the TCC, the COE Manual[73] and the Letters of Assist.

A deployed Engineer Units must possess and maintain the requisite resources and personnel to support their administrative and logistical needs throughout the mission's duration, except were supplemented by the UN. To ensure preparedness and operational sustainability, TCCs and their contingents must have a clear understanding of the support provided by the UN versus what they must self-supply.

Special attention must be given to comprehensive requirements for rations, water, shelter, medical support, and supplies. While Combat Engineers are generally equipped to handle their own force protection, the security of non-combat engineering units must be thoroughly integrated into the planning process by the tasking authority to ensure overall mission safety.

Before deployment, negotiations between UN HQ and the TCC should include any requirements for major MILENG activities, including the construction materials or special equipment. Early identification of major engineering requirements is essential to reach full operational capability as soon as possible, especially when Engineer Units are establishing their facilities in new locations. Major Military Engineering tasks are a Mission responsibility and shall be included in the Mission’s Master Engineering Plan.

[71] See: United Nations Manual for the Generation and Deployment of Military and Formed Police Units to Peace Operations

[72] See: TCC Generic Guidelines for Deploying Military Units to UN Peacekeeping Missions

[73] See: Manual on Policies and Procedures concerning the Reimbursement and Control of Contingent-Owned Equipment of Troop/Police Contributors Participating in Peacekeeping Missions. The current version is available through the UN digital library system https://digitallibrary.un.org.

4.1. Military Engineer Unit Commanders role and responsibility

It is the commander's responsibility to ensure operational readiness and employment, which includes requesting appropriate support in a timely manner and indicating the operational constraints if he does not receive this support. Further the implications of casualties or fatalities, consumption, materiel losses and resupply lead time are to be considered and planned accordingly, allocating and balancing resources, adapting the plan if required, to reduce the impact of unavoidable constraints on resources. The commander must consider UN and TCC guidelines when determining further sustainment requirements and selection of personnel. This includes:

- Maintain full accounting of all unit personnel and equipment.
- Maintain an accurate status of required on-hand supplies and forecast emerging requirements.
- Maintain an accurate status of training readiness of the overall MILENG unit and any subordinate units and forecast for emerging requirements.
- Ensure all equipment is maintained and is in working order, with commensurate operationally required supplies to operate the equipment.
- Effectively communicate the unit's supply, personnel, training, and equipment readiness status to higher headquarters.
- Request logistical, training, and administrative support, as needed, to affect all the above.

4.2. UN Headquarters Support to the Military Engineer Unit

DOS at UN Headquarters provides dedicated support to field Missions for financial reimbursement, logistical support services, communications and information technology, human resources, and general administration to field Missions. Support is delivered to field Missions and TCC contingents by DOS to the respective Mission through the DMS/CMS and their subordinate staff.

The determination of financial reimbursement to UN Member States for COE is established through the COE Working Group and UN legislative bodies. The details of this reimbursement at the contingent level are included in the MOU, which is the primary financial reference for contingent logistics support (including support for the MILENG Unit) for each Mission.

Major equipment (if not in the COE Manual) may be treated as a "special case" if the situation requires. Maintenance of this special case equipment is a TCC responsibility if the equipment is under wet lease.[74]

In accordance with the COE Manual, any special minor equipment or consumables not covered by the standard self-sustainment rates may be categorized as "unique equipment." These items will be reimbursed according to bilateral special case arrangements between the troop/police contributor and the UN.

[74] See COE Manual for an explanation of wet and dry lease.

The DOS logistics plan is the basis for identifying resources that may be re-deployed from other locations (e.g., the UN Global Service Center or another field Mission) to support Mission deployment. Additionally, the DOS logistics plan may provide a basis for negotiations with potential TCCs for provision of COE that each individual troop contributor is required to bring to the Mission along with associated, applicable self-sustainment services.

4.3. Deployed Military Field Headquarters Support

The Deployable Field Headquarters, whether it is the Mission Headquarter (FHQ) or the SHQ can support the MILENG unit with all its staff departments, in the areas e.g., planning, logistical support services, communications and information technology and general administration.[75]

The Engineer Unit must therefore liaise with both the FHQ and Sector logistics structure (DCOS Operations Support, U-4/G-4, U-1/G-1), the Force Operations Support Office, the Office of the CSDM under DMS, the Chief Engineer and the Mission Support Center.

During a deployment, an MILENG unit will use and consume routine amounts of normal classes of supply that will need to be replenished based upon unit usage rates, mission requirements, and the operational environment. Operations planning will further determine the specific logistic requirements and the associated logistics command and control structures for each operation when a MILENG unit is committed.

Following the initial period of self-sustainment and in addition to TCC obligations for continued support of the deployed contingent, additional MILENG support and operational requirements are to be requested on provided by the Mission's DMS/CMS through the Office of the CSDM and Chief Engineer. Details are specified in the TCC Generic Guidelines for Deploying Military Units to UN Peacekeeping Missions[76] and the COE Manual[77], but generally this applies to:

- Food rations (storage, cooking and sometimes transportation is a contingent responsibility).
- Bulk raw water or access to bulk raw water (TCCs are responsible for transport, purification, and storage).
- Bulk fuel and petroleum-based lubricants/POL (TCCs may be responsible for transport and storage).
- Strategic movement of Contingent-Owned Equipment and personnel from the home country to the Mission area of operations.
- Main supply route, road/other infrastructure upkeep. Minor engineering and routine upkeep are a TCC responsibility. (Consult the COE Manual and applicable MOU for further guidance.).

[75] See: United Nations Deployed Military Field Headquarters Handbook

[76] See: TCC Generic Guidelines for Deploying Military Units to UN Peacekeeping Missions

[77] See: Manual on Policies and Procedures concerning the Reimbursement and Control of Contingent-Owned Equipment of Troop/Police Contributors Participating in Peacekeeping Missions. The current version is available through the UN digital library system https://digitallibrary.un.org

- Blood and blood products.
- Normal waste collection, disposal, and management, to include hazardous material / waste management and disposal.

The Deployed Military Field Headquarter will further support and provide the MILENG unit with the following product of the respective sections or advisors:

- Peacekeeping-Intelligence products (threat assessment, road books, etc.).[78]
- Geographic information products (see chapter 4.5.)
- Threat analysis, patterns, and trends.
- Provision of means of communication and frequencies.
- Provision of ammunition storage, either for rendered safe ammunition for future destruction or own explosives.
- Equipment repair / maintenance / recovery – for repair support beyond the capabilities of the MILENG unit technicians.
- Transportation – For lift and heavy transport movement capability that is beyond the unit's internal assets, e.g., Material Handling Equipment (MHE), Heavy Equipment Transport (HETs), aerial, rail, or maritime movement.
- Support of required training
- Expertise and advice regarding legal issues, cultural particularities, etc.

Equipment for communications between the Mission, FHQs/SHQs and the MILENG unit is provided as UN-Owned Equipment (UNOE). This ensures that the MILENG unit has secure, standardized military-grade communications within the force and mission's communications network.

The unit's internal communications and information systems is a TCC responsibility and must include all line and radio communications from unit command down to all subordinate elements.

In addition, the HQ is also responsible for frequency management and will provide the required frequencies for communication, as well as e.g., ECM devices.

The corresponding HQ is also to be addressed for any request regarding support of units or elements to support directly or indirectly an MILENG unit in conducting their tasks, such as e.g.:

- Interpreters. Based on operational need, military units use military and/or civilian interpreters provided by their TCCs, or locally employed interpreters who are normally contracted and provided by the Mission's DMS/CMS.

[78] See: Handbook on Military Peacekeeping-Intelligence

- Casualty Evacuation/Medical Evacuation (CASEVAC/MEDEVAC)[79] transportation and support for movement of sick and wounded personnel to appropriate medical facilities.[80]
- FP elements
- Air support (transport, surveillance, etc.)
- Medical support / CASEVAC
- Fire Fighters
- Military Police or UN Police
- ECM assets, e.g., CREW detachments
- Recovery vehicles or assets
- Public Information Officer (PIO), to exploit the success of an EOD operation for own strategic communication purposes.

4.4. Support of United Nations Civilian engineers

Civilian engineers under the Service Delivery Management Pillar of the civilian structure of a Mission play a crucial role in supporting military engineers in UN peacekeeping missions by providing specialized expertise, material, and equipment. They contribute significantly to the conceptualization and design and approval of projects, offering technical support and advice throughout the process of the project management.

They can assist with contracting necessary equipment or services (e.g., soil analysis), procure materials required for building infrastructure, ensuring that projects meet both technical and environmental standards including obtaining personnel with necessary national certificates, and coordinate efforts with Host Nations to ensure compliance with local regulations and standards.

Civilian engineering activities are governed by the DOS Engineering Support Manual for Field Missions[81], which outlines procedures to be followed and provides a list of other relevant guidance reference documents.

[79] Casualty Evacuation (CASEVAC) entails the evacuation (by air or land) of a casualty from the site of injury to the closest medical facility. This category of patient transfer shall be conducted within 1 hour of injury. Medical Evacuation (MEDEVAC) entails the evacuation of a casualty between two medical facilities; either within the Mission area (in-theatre) or out of Mission area. MEDEVAC should be conducted depending on the medical urgency.
See: Medical Support Manual for United Nations Field Missions

[80] For comprehensive guidance on medical operational, logistical, and administrative guidelines for Member States, UN Headquarters and Field Missions, consult the Medical Support Manual for United Nations Field Missions

[81] See: DOS: Engineering Support Manual for Field Missions

4.5. Geospatial Information Support

Geospatial Information Services (GIS) plays a crucial role in assisting UN Military Engineering operations by providing broad tools for spatial analysis and data management. Using GIS, MILENG can assess terrain conditions and identify optimal locations for infrastructure development and rehabilitation, such as roads, bridges, and facilities. GIS tools provide situational awareness and a common operational picture to all stakeholders involved in the operational aspects of field mission operations, including military, police, humanitarian, political, support, and all other mission components. GIS facilitates risk management by providing potential hazards and implementing safety and security measures. GIS supports logistics by optimizing supply chain management and improving mobility in complex environments. Also, GIS enhances decision-making, operational efficiency, and the effectiveness of military engineering efforts in UN peacekeeping missions. Additionally, GIS enables geographical data collection, analysis, and visualization, which is essential for planning and executing engineering projects.

Geospatial Information Services are provided at all levels of UN field operations. In the field missions, initial GIS services are provided by GIS Units embedded in Field Technology Sections (FTS). The Global Service Centre (UNGSC)[82] is in charge of the direct support to field missions and provides advanced GIS services, including GIS online applications, advanced image analysis, and specialized GIS projects such as Groundwater Exploration projects.

The GIS Section at the Office of Information and Communications Technology (OICT)/UN Headquarters in New York provides GIS Services to the UN principal organs, departments, and Offices of the Secretariat. It also develops GIS-related strategies and policies for the GIS Program of the United Nations.

4.5.1. GIS Services in the Field Missions

GIS Services at the field missions are available through GIS Units of the Field Technology Sections (FTS). The FTS also serve as the primary point of contact for GIS services in missions lacking dedicated GIS support. Where a direct onsite support is not provided, MILENG units are also encouraged to direct any inquiries to the generic email address in UNGSC (ungsc-gis@un.org) who will then direct to the relevant recipient for appropriate response(s).

GIS Units are responsible for ensuring that all mission components are equipped with suitable geospatial information in a timely and effective manner to support their operational requirements and mission mandate. GIS Units support the mission's planning and day-to-day operations and enhance situational awareness, safety and security, remote monitoring, and surveillance activities.

The GIS Services include:

- mapping production,
- terrain analysis,
- geospatial intelligence,
- validation and processing of geospatial data collected by the mission, and
- acquisition and analysis of satellite and drone imagery.

[82] See: https://www.ungsc.org

The GIS Unit supports GIS infrastructure in the mission, including specialized GIS equipment, software, and large-scale plotters for mapping production.

The GIS Unit collects and evaluates the mission's long and short-term requirements for advanced and specialized GIS services and liaises with the UNGSC for the provision of specialized and advanced GIS services.

In missions with no GIS Units, the mission components may direct their requirements through a focal point in FTS to escalate to UNGSC, if applicable.

4.5.2. GIS Services in the UN Global Service Centre

The United Nations Global Service Centre (UNGSC) is a vital technical component of the support structure for the UN's peacekeeping operations. With locations in Brindisi, Italy, and Valencia, Spain, the UNGSC provides operational support, geospatial information services, information technology services, and training for UN peacekeeping missions worldwide. One of the UNGSC's key roles is the provision of GIS Services through Service for Geospatial, Information, and Telecommunications Technologies (SGITT). SGITT is a Centralized hub for advanced and specialized GIS services, online portals, data hubs, and image analysis.[83] UNGSC provides a critical ICT and GIS infrastructure to support the operations in UN field missions.

The UN Military Engineering may request UNGSC GIS Services through the GIS Unit or the FTS focal point.

4.5.3. GIS Section in the UN Headquarters

The UN Geospatial Information Section (UNGIS) in the UN headquarters in New York provides GIS services to the Security Council, Secretariat's Departments and Offices[84], and develops partnerships with various international institutions, Members States, commercial companies, NGOs, and academia. This central body is responsible for developing geospatial information strategies and a framework that aligns with the UN's broader mandates. UNGIS work involves establishing standards, guidelines, and best practices for data collection, management, and analysis through the UN Committee of Experts on Global Geospatial Information Management and various initiatives such as Second Level Administrative Boundaries, UN Maps, and UN Open GIS Initiative.

4.5.4. GIS Services

Initial mapping products

GIS Units in UN field missions provide essential geospatial services that support a wide range of field missions' operational needs. GIS units provide initial GIS online services and develop and distribute planning, analytical, thematic, and topographical maps, and nautical charts to all mission components, including military engineering.

Maps and Image Analysis products provided by GIS units accurately represent geographic areas of operation, helping field personnel understand terrain features, infrastructure, and

[83] See: https://www.ungsc.org/business-services/sgitt

[84] In the UN Headquarters, OMA Military Engineers can request GIS Services through the UN GIS Section. If the GIS Section does not have the capacity to provide the required services, Chief UNGIS may determine to request support from UNGSC.

potential obstacles. These services are fundamental for mission planning and execution, enhancing the efficiency and safety of UN operations in complex environments.

Beyond traditional mapping, GIS Units offer advanced geospatial products such as threat risk simulations, Digital elevation, and 3-D models, and maintain geospatial databases. Additionally, GIS Units provide printed mapping, facilitating ground operations where internet access might be limited.[85]

UN Maps and geodata

UN Maps is an innovative platform hosted by UNGSC.[86] It combines UN authoritative data with crowdsourcing, effectively engaging civil society worldwide in contributing to the UN mapping needs. Initially designed to serve the needs of peace operations and informed by the needs of field missions, UN Maps has become a broader platform for cooperation across the UN system. Already serving in multiple instances of crisis response, such as mapping thousands of missing buildings in the aftermath of major earthquakes and floods, a growing number of UN entities are now contributing their data to the platform.

UN Maps enriches topographic and operational data in areas where the United Nations operates. This includes creating and maintaining high-quality maps of roads, buildings, infrastructure, and other features that are essential for peacekeeping and humanitarian operations. UN Maps provides peacebuilding and humanitarian actors with topographic maps, operational geo-information, search and navigation tools, and imagery and satellite data. This information can help to plan and coordinate activities, assess needs, and respond to emergencies.

UN Maps offers operational data layers for various applications, including Unite Aware[87], a UN situational awareness platform. The data include various baseline and UN operational data, such as refugee camps, minefields, conflict areas for operational data or roads, bridges, communities, or water bodies for the baseline data.

Access to UN Maps can be requested through GIS Units in the Field Missions or FTS focal points.

Topographic maps on demand

Topographic Line Mapping (TLM) is essential for MILENG, as it involves a detailed representation of the Earth's surface using contour lines to illustrate elevation changes.[88] These topographic maps are vital tools for MILENG, providing crucial information for elevations, possible flood areas, infrastructure development, operational planning, mobility, risk management, and environmental assessment.

With the necessary data available, UNGSC developed the UN Maps' "Maps on Demand" solution. This dynamic, secure, and scalable self-service tool empowers non-GIS users to generate high-quality maps as needed.

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[85] For more complex, specialized, and advanced products, GIS Units may request support from UNGSC.

[86] See: https://maps.un.org

[87] See: https://uniteaware.un.org

[88] Developing TLM includes collecting accurate geographical data through aerial photography, satellite imagery, and ground surveys. These data features are extracted and analyzed to generate contour lines that connect points of equal elevation, illustrating the terrain's shape, including hills, valleys, and slopes.

Available through the UN GeoPortal[89], "Maps on Demand" provides a variety of map types, including topographic maps with 50K and 100K scale, city maps, UN Camps and site maps, and road books using both UN-developed datasets and datasets from other partners.

UNGSC is the service provider and access to the “Maps on Demand” can be requested through GIS Units in the Field Missions or FTS focal points. In the UNHQ, the services are available through UNGIS.

Earth Observation Technology and Image Analysis Services

Earth observation technology (EOT) has demonstrated significant innovations and provides enormous potential for supporting military engineers. Continuous advancements in optical imagery resolution now enable capturing images with resolutions higher than 30 centimeters, providing exact details of observed objects. This level of detail allows for accurately monitoring and assessing critical situations or infrastructure in areas of operations. Enhanced resolution supports identifying features such as infrastructure damage, Security situations, troop movements, and illegal activities, providing critical information for decision-makers.[90]

EOT and Imagery analysis are critical for MILENG, offering insights that enhance the effectiveness and safety of engineering operations in the UN Field Missions. Imagery Analysis provides high-resolution satellite and aerial imagery, which can be used to conduct detailed terrain analysis and site reconnaissance. This is essential for planning and constructing military facilities, such as roads, bridges, UN Camps, airstrips, and defensive structures.

By analyzing these images, engineers can assess the suitability of locations, identify potential obstacles, and develop strategies to mitigate environmental challenges. For instance, Imagery Analysis can reveal hidden topographical features, soil composition, and water sources, which are critical factors in site selection and construction planning. In addition to site reconnaissance, Imagery Analysis is instrumental in monitoring and assessing infrastructure integrity and operational environments. MILENG can use imagery analysis to detect and evaluate damage to critical infrastructure, such as bridges, roads, and buildings. This capability is vital for planning repairs, ensuring safe passage for troops and supplies, and maintaining operational readiness. Imagery Analysis also supports such engineering projects as site selection and site protection, allowing the development of countermeasures and enhancing force protection. Applications of imagery analysis for MILENG include terrain mapping, structural assessment, route planning, damage

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[89] See: https://geoportal.un.org

[90] The collection and process of vast amounts of earth observation information require further innovation in Geospatial artificial intelligence (GeoAI) and machine learning, where models and algorithms support the fast and accurate image interpretation and detection process.

Synthetic Aperture Radar (SAR) imagery allows the capture of high-resolution images of areas of interest regardless of weather conditions or time of day. The technical characteristics of SAR sensors allow fast and reliable change detection of vast territories, providing a snapshot and indicating the areas that require immediate attention. The technical characteristics of Shortwave Infrared (SWIR) and Near-Infrared (NIR) bands significantly enhance the capability to detect and analyze various environmental, natural, and manufactured objects.

These bands are effective for vegetation analysis and classification, enabling monitoring of vegetation health, species classification, and agricultural assessments. The deployment of a high number of mini-satellite constellations has enabled the collection of imagery and satellite videos multiple times throughout the day, providing real-time data to the stakeholders, whereas traditional satellite systems could only capture imagery every other day at best. These significant and continuous innovations in Earth Observation technology enhance situational awareness and the decision-making process. Nera-real-time data collection allows for timely responses.

assessment, and environmental and flood impact analysis, all of which contribute to informed decision-making and efficient resource allocation in the UN field operations.

Initial access to Earth Observation Technology and Image Analysis Services is available to MILENG at the GIS Units in the field missions. Advanced image analysis can be requested to UNGSC through GIS Units or FTS focal points. In the UNHQ, EOT and Image Analysis Services are available through the UNGIS.

Digital Twin

Utilizing imagery captured through satellites and drones, 3D models of UN camps or large areas are created, providing users with a visualization of the situation on the ground at various levels of detail, from schematic views to detailed replicas, including indoors. The versatile Digital Twin models can be implemented in numerous applications, including infrastructure assessment, planning security and logistic operations, inspections and monitoring, simulation scenarios, Virtual and Augmented Reality, and training. UN Maps empowers this service and supports other field programs such as Unite Field Remote Infrastructure Monitoring (FRIM) and Smart Camp, thereby enabling field missions with enhanced support for their respective mandates.

Requests for Digital Twin Services can be made through GIS Units in the Field Missions or FTS focal points. Production is collaborative and handled by Field Missions and UNGSC.

GIS Workspace

UNGSC's GIS workspace offers centralized access to GIS software and resources, enhancing geospatial data management and analysis. Hosted in a Tier III ISO-certified data center, it integrates commercial and open-source software, requiring only a medium-capacity workstation and stable internet.

The workspace ensures interoperability, allowing seamless access to spatial and non-spatial data across devices.[91]

UNGSC is the service provider for GIS Workspace infrastructure. Military engineers can request access to this project through GIS Units in the Field Missions or FTS focal points.

[91] VMware Horizon provides virtual workspaces for various GIS profiles, supporting applications like ArcMap, ArcGIS Pro, QGIS, and Power BI. Centralized data management and easy sharing enhance collaboration and informed decision-making. Features like multifactor secure access and disaster recovery ensure data security and reliability.

4.5.5. GIS Specialized Projects

Groundwater exploration

The UNGSC developed a solution for locating, drilling boreholes, and supplying/distributing water resources to peacekeepers. The earlier the water assessment process workflow is initiated, the sooner camp facilities can commence, and therefore, the deployment readiness can be enhanced by shortening the preparatory phase and eliminating key planning uncertainties.

UNGSC is the provider of Groundwater exploration projects. MILENG can access this project through GIS Units in the Field Missions or FTS focal points.

Subsurface exploration

The GSC developed a geophysical service using Ground Penetrating Radar (GPR), a non-destructive instrument that can be employed in the field to identify without excavation underground targets, such as suspected clandestine burial/potential mass-grave sites, sub-surface utilities, and pollutants to ease work planning, design, and excavation operations. The produced radar maps and three-dimensional reconstructions enable the view of underground anomalies, improving awareness before excavation.

MILENG can also be helped with a training package for the GPR, including Basic and Advanced courses.

4.5.6. GIS Training

Basic GIS, map and satellite imagery reading training courses can be requested and provided in field mission locations by GIS Units.

Advanced GIS training courses are provided in UNGSC. The center offers a comprehensive suite of training program designed to equip UN personnel with the necessary skills to leverage geospatial technology. These programs cater to a wide range of expertise levels, from GIS senior managers to experienced GIS professionals. The training curriculum covers GIS concepts, data acquisition, analysis, visualization, and mapping techniques. Additionally, the UNGSC emphasizes practical applications of GIS in peacekeeping, humanitarian aid, and development projects.

Another set of advanced training, specifically developed for peace and security applications are the IMINT & GEOINT workshops, provided by UNGSC in the field or remotely.

Additionally, GIS Units from field mission also provide close support to G7/U7 in providing Micro Unmanned Aerial Systems (MUAS) training for U-2/G-2, U-6/G-6, and U-8/G-8 (MILENG) branches.

4.6. Medical Support

MILENG Units typically deploy with their own integral Level 1 medical facility. Higher levels of medical support are a Mission responsibility provided through CASEVAC/MEDEVAC. Each MILENG unit (company equivalent) may deploy elements within the Mission area with an attached medical element subject to availability, if required. The ability to evacuate MILENG unit casualties to appropriate medical facilities must be prearranged and verified before each MILENG unit operation.

During the planning phase of each operation, special attention must be given to available CASEVAC or MEDEVAC capabilities, procedures[92] and timing with the appropriate staff officers at FHQ/SHQ. UN Mission CASEVAC/MEDEVAC assets and Mission Medical Facilities will provide additional transportation/medical support and should train with the Mission's MILENG unit corresponding procedures.

Each unit is responsible for the provision of a "10 minute" initial response/ "buddy first aid" to their personnel. Training is to be conducted as part of pre-deployment training in the home country.

CASEVAC training is aimed at interoperability with enablers, including medical personnel, aviation assets, ground transportation assets and other force elements such as the Quick Reaction Force (QRF). When aerial CASEVAC assets are not available or appropriate, alternate CASEVAC may be arranged using force or Mission ground assets and procedures.

4.7. Support for Mental Health

Due to the particularly challenging situation of constant exposure to death or injury when dealing with EOs and IEDs, but also since, from the perspective of the perpetrator, successful EO or IED incidents often end with casualties and fatalities, EOD units in particular, but MILENG units in general must be given special attention regarding their mental health.

This includes offering them appropriate opportunities to reduce stress during operational breaks, e.g., through sports facilities or other installation of moral and welfare.

However, this also includes the dedicated provision of appropriate psychological and, if desired, spiritual support to better process the experiences.

[92] All planned aviation-related activities, such as transportation by air (including medical and casualty evacuation), reconnaissance, selection of temporary helicopter landing sites, etc. must be coordinated with the Mission Aviation and Movement Control elements in order to meet specific requirements stipulated in the respective Aviation, Movement Control and Aviation Safety policies, manuals and SOPs.

See: Aviation Manual for specific requirements to transport weapons on board UN-chartered aircraft.

The UN has developed “UN’s MindCompanion”, a mobile app available on both Android and iOS[93], designed to improve access to mental health education and care. Users can access its features both online and offline, with guaranteed privacy and confidentiality. The app aims to raise awareness about mental health, promote coping strategies, and provide easier access to educational resources. It also encourages a supportive workplace atmosphere and helps reduce obstacles to seeking help. With its self-assessment tool, users can regularly evaluate and monitor their mental well-being over time.

4.8. National Support Elements (NSE)

With prior UN HQ approval, TCCs providing military and/or police personnel to UN Missions may augment those personnel with an NSE. TCCs may choose to organize NSE to perform their deployed contingents administrative and logistical services with national standards of support that may differ from UN requirements.

An NSE includes personnel and equipment in addition to those agreed to by the UN and TCC under the terms of the applicable MOU and/or as described in the SUR for the specific Mission. Further details on this are provided in the Policy on National Support Element[94].

If this augmentation exceeds UN requirements, the UN offers no reimbursement or financial liability for NSE costs, rotation, or self-sustainment. Nonetheless, for purposes of legal status, NSE personnel are considered part of the TCC’s military contingent. The total personnel strength of the NSE is specified in the Policy on National Support Element and in the applicable MOU between the UN and TCC but should be reasonably proportionate to the strength of the contingent.[95]

[93] See Google Play Store or Apple App Store

[94] See: Policy on National Support Element

[95] In general, the strength of the NSE is not to exceed 10 percent of MOU strength up to a maximum of 50 personnel, whichever is lower, without strong justification by the T/PCC. All additional costs incurred by the UN field mission that are associated with NSE personnel and equipment will be recovered from the respective TCC.

5. Training for the Military Engineer Unit

Training is a command responsibility at every organizational level. Military commanders and supervisors have an obligation to ensure their personnel and units are appropriately trained to accomplish their missions. MILENG Units are normally composed of personnel from a single TCC but may occasionally include elements from other TCCs.

The UN fully recognizes TCC sovereignty and prerogatives when it comes to the military training of their personnel and units. TCC national military training is the foundation upon which Engineer Units must then add adapt to the UN peacekeeping context.

The training requirements mentioned in this Chapter are task-oriented and focus on what is needed for UN peacekeeping. The intent is to provide contingent commanders and subordinate leaders a consolidated list of important topics as they prepare their units for UN deployment and post-deployment. Commanders and subordinate leaders should develop these training topics in greater detail to suit the needs of their units. To meet the specific UN standards and requirements the Integrated Training Service (ITS), of the Policy, Evaluation and Training Division of DPO at UN Headquarters, provide Specialized Training Materials (STM) available on the Peacekeeping Resource Hub[96].

Upon arrival in the Mission area, the FHQ is responsible for contingency training of Military Engineer units. Individual and collective MILENG Unit training should also focus on interaction with different Mission elements, partners and other actors present in the area of operations.

MILENG Unit training should be based on Mission requirements contained in the SUR. These requirements should include intensive system and technology-specific training on UN-provided equipment. The Information, Communications and Technology Division of the DOS sets the framework for this part of the required training and unit preparation.

The United Nations Infantry Battalion Unit Manual (UNIBAM)[97] provides details for infantry unit training and should be studied by all supporting units, such as MILENG, deploying for a Missions. The overarching principles of UN Peace Operations described therein are applicable to all military units.

TCC training emphasis should include:

- military planning,
- the ability to integrate and coordinate diverse specialist personnel and equipment,
- communications skills (both oral and written),
- the development of a versatile and flexible mind-set,
- cultural awareness and sensitivity,

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[96] See: https://peacekeepingresourcehub.un.org

Specialized Training Material (STM) for

- Military Engineer Units
- Military EOD Units and
- Military Staff Officers

[97] See: United Nations Infantry Battalion Unit Manual (UNIBAM)

- language skills, and
- knowledge of the UN communications and information technology system.

While military training may vary according to national goals and resources, there are fundamental training requirements that should be observed when preparing to deploy to a Peace Operations Mission. Knowledge of the UN command and control and logistics systems, specifically for MILENG units, as explained in this manual, is essential for contingents to operate effectively within the integrated UN field Mission.

TCCs are encouraged to develop leaders who are capable of working within a civilian-managed Mission support structure while remaining responsive to supported military units and the Mission's military chain of command. Beyond mastering specific technical subjects, MILENG Unit leaders should be capable of coordinating all military unit functions to achieve a coordinated application of unit assets.

The ability to work with other nationalities is a fundamental requirement in UN operations. Language training and Mission-specific cultural familiarization could be incorporated into the TCC's long-term professional military curriculum, not just its pre-deployment training. Since English and French are the two languages most frequently applied in UN Missions, it is highly desirable for Engineer Unit personnel to be proficient in English and/or French languages (written and oral) depending on mission requirements.

Preparing key contingent members to communicate in the English and/or French languages allows them to integrate their unit into the overall Mission. Moreover, it can be invaluable to assign at least two bi-lingual Engineer Unit persons to operate the MILENG unit radio/communication room.

TCCs are encouraged to work with DPO's ITS to develop classroom instruction and command post exercises that provide UN Peace Operations orientation that can then be added to TCC military professional training.

5.1. Pre-deployment training

According to General Assembly Resolution A/RES/49/37 (1995), Member States have the responsibility for delivery of pre-deployment training for uniformed personnel deploying to UN operations.

As a recommended reference, the MILENG specialized training materials (STM) developed in alignment with this manual, include learning activities and comprehensive scenario-based exercises to practice and test participants. The MILENG STM are available on the Peacekeeping Resource Hub.[98]

[98] See: https://peacekeepingresourcehub.un.org

Training requirements of particular note for MILENG Units include:

- Mission Rules of Engagement; UN Peacekeeping Principles
- Protection of Civilians; International Human Rights and Humanitarian Law
- Human Rights and Due Diligence Policy on UN support to non-UN security forces (HRDDP);
- UN Policy on Human Right Screening
- Prevention of Sexual Exploitation and Abuse (PSEA)
- UN Supplier Code of Conduct
- UN Peacekeeping-Intelligence Mission-specific geographic and environmental conditions whose unique physical and operational characteristics present certain challenges for effective operating.
- Mission-specific guidance obtained from documents issued by DPO, Office of Military Affairs, such as the SUR and Guidelines to TCCs; the ITS's Pre-Deployment Information Packages; and Field Mission documents such as the FC's Training Directive.
- Observations resulting from reconnaissance by the incoming Engineer Unit commander and staff to the Mission area.
- Lessons learned from the outgoing MILENG Unit.
- Explosive Hazard/Threat Education and asymmetric threats present in theatre.

Even so Military Engineer units are already highly qualified regarding EO, the completion of the EHAT[99] is required, to ensure that every peacekeeper is familiar with the threats and aware of current trends.

As part of the Specialized Training Material (STM) for United Nations Infantry Battalions, Annex E, the Peacekeeping Resource Hub provides material as well for the All-Arms Search Course (AASC).[100]

In addition, every peacekeeper is required to complete the Basic First Aid Course (BFAC) as well as part of the Pre-Deployment Training.[101]

The course is also available as application (App) "UN Buddy First Aid" for mobile devices.[102]

[99] See Peacekeeping Resource Hub, Functional Training, Specialized Training Material (STM)

[100] See: Peacekeeping Resource Hub, STM for UN Infantry Battalions, Annex E

https://peacekeepingresourcehub.un.org/en/training/functional

[101] See: See UN Medical Support Manual

See: Peacekeeping Resource Hub, Pre-Deployment Training, Modul 3
https://peacekeepingresourcehub.un.org/en/training/Pre-Deployment/cptm/module3

[102] See: Google Play Store or Apple App Store

5.2. In-Mission Training

Once deployed, MILENG unit personnel are to participate in the mandatory induction training. Amongst other important session, the training contains mission specific IED Threat Mitigation lessons, which provides latest trends and assessments.

Although some MILENG personnel might be trained and qualified as EOD, they need to familiarize themselves with the geography, established procedures, etc. Induction training is a continuation of pre-deployment training. The information will allow better planning and execution of the given tasks.

EOD units may be tasked to conduct the IED Threat Mitigation training for other units, since the provide the required expertise.

To maintain the operational readiness of the MILENG unit's personnel, special training must also be carried out on a regular basis, to train procedures which are not used frequently or to integrate and improve new TTPs. This special training should be practically oriented in nature. It is the unit commander’s responsibility to schedule training accordingly and coordinate with the headquarter the required stand-down phases to conduct the trainings.

6. Evaluation of Military Engineer Units

The evaluation of peacekeeping Military Engineer Units is a critical process that occurs both during the preparation phase and during deployment. The Pre-Deployment training is designed to ensure that units meet the necessary standards to pass a series of evaluations. The Pre-Deployment training should be oriented to successful achievement for the required performance standards to pass the required evaluations. In addition, mission evaluations aim to assess whether the initial training levels have been maintained, if the unit is operationally effective, and to identify any necessary adjustments within the mission area or for future rotations. These evaluations are conducted at various stages of the preparation and deployment in the Mission area, and include three types of evaluations:

- Self-certification/Pre-deployment Self Evaluation
- Military Skill Validation during Pre-Deployment Visit (PDV) or Pre-Rotation Visits (PRV)
- In-Mission Evaluation by FHQ/SHQs.

6.1. Self-certification/Pre-deployment Self Evaluation

This evaluation aligns with the UN Operational Readiness Preparation Policy[103] and Operational Readiness Preparation Guidelines[104], which outline a framework, including timelines for the evaluation and self-certification of UN Military units provided by TCCs in accordance with Statement of Unit requirements, the COE Manual, and other UN PK Missions Military Unit Manuals (UNMUM).

Evaluations should follow an integrated, multi-tiered system progressing from individual soldiers to commanders and from Teams and Platoons to larger formations like Companies and Battalions/Task Forces. This approach assesses each level for task completion and its contribution to operational effectiveness. These evaluations-oriented manner to systematically build expertise and integrate capabilities, ensuring collective efforts align with the mission's strategic objectives and yield measurable outcomes.

TCCs should utilize detailed standards[105] and checklists on operational readiness, with a focus on Peace Operations in general and MILENG tasks in particular, to identify those unit capabilities that need improvement. Early identification allows performance or equipment shortfalls to be addressed before they accentuate further. Annex D provides a sample of checklists to be used for this purpose.

[103] See: Operational Readiness Preparation Policy

[104] See: Operational Readiness Preparation for Troop Contributing Countries in Peacekeeping Missions Guidelines

[105] Can be accessed through the Peacekeeping Capability Readiness System website (PCRS) (https://pcrs.un.org) or the Peacekeeping Resource Hub (PKRH) https://peacekeepingresourcehub.un.org

6.2. Military Skills Validation (MSV) during Pre-Deployment Visit (PDV) or Pre-Rotation Visits (PRV)

The purpose of formal pre-deployment/pre-rotation evaluation (refers to MSVs conducted under PRV/PDV) is to assist TCCs and military contingents in meeting national and UN standards of operational performance/effectiveness. The existing level of training & readiness is validated against clearly measurable and quantifiable standards that are specific, achievable, realistic, and time-bound in nature to help TCCs to identify shortfalls in readiness at an early stage, so that they can take mitigative efforts before deployment to the mission.

The operational readiness of MILENG units is evaluated based on distinct criteria such as Mission requirements, organizational structure, operational standards, the capability to perform mission essential tasks (MET) or mandated tasks, standards achieved in training, as well as administrative and logistics standards. This evaluation will analyze task-oriented activities at each level within the military contingent to include individuals, task-oriented groups, and commanders.

A military unit is expected to be well trained and qualified in basic military skills and conventional military tactics, techniques, and procedures according to specific national military standards prior to concentration for peace operations training. DPO-organized Pre-deployment visits (PDV)[106] is an independent evaluation prior to a unit's initial deployment to the Mission area. Pre-deployment evaluations by the TCC and DPO/DOS may include validation of the unit's ability to:

- Ensure timely assembly, grouping, and equipping of the Engineer Unit in accordance with the SUR and MOU.
- Conduct Mission-specific, task-oriented, individual, and collective tasks/capabilities.
- Identify shortcomings and take corrective measures for capability enhancement.

Military Skills validation (MSV) during the Pre-rotation Visits (PRV) is primarily focused on certain repeated or severe underperformance issues noted during the in-mission evaluation of previous rotations in the mission areas. Such an MSV validates the level of mitigative efforts by TCCs in subsequent rotation for performance improvement.

6.3. In-Mission Evaluation by FHQs/SHQs

After deploying to the mission area, the UN Military Engineer Unit is responsible for a wide range of critical tasks to enable the successful implementation of the mission mandate. The unit's primary role is to provide essential engineering support to facilitate the deployment, operations, and sustainment of the overall UN force. This includes constructing and maintaining base camps, roads, airfields, and other critical infrastructure; conducting obstacle clearance and route improvement to ensure freedom of movement; providing water supply and sanitation services; and establishing field defenses to enhance force protection. Additionally, the engineer unit may be tasked with conducting counter-explosive threat search and EO disposal operations to mitigate the threat of mines, UXO, and IEDs.

[106] See: SOP on Planning and Conducting Pre-deployment and Pre-rotation Visits

In-mission Evaluation, therefore, should aim to analyze task-oriented activities with dual focus of achievement of tasks and their effects in an effects-oriented manner. The evaluations should cover each level within the military contingent to include individuals, groups, and commanders.

For the In-Mission Evaluation by the Force Commander, U7 should collaborate with other staff functions in the Force HQ, to bring in operational effectiveness perspective into the evaluations. This leads to tailor-made evaluation for different contingents. The U7, in close coordination with the U-8 MILENG or Force Engineer, should plan for the evaluation in accordance with the performance evaluation standards/TSIs (Task, Standards, and Indicators) set by UNHQ. U7 should also consider mission context and prevailing operational environment, which is geared to the specific local conditions and challenges[107]. Detailed TSIs for the MILENG unit is attached as Appendix 2 to Annex D to this Manual in addition to the websites mentioned in section 6.1 above.

6.4. Role of UNHQ & Mission leadership in Performance Evaluation and Improvement

DPO/DOS promote evaluation, operational readiness, and commitment to UN standards with a flexible and accommodative approach by:

- Guiding, assisting, facilitating, or supplementing TCC efforts in evaluation.
- Providing training assistance through the ITS.
- Guiding and assisting emerging TCCs (and other TCCs on request), focusing on basic military training, output requirements and technology-related issues.
- Providing an Operational Advisory Team from DPO/DOS to guide and assist emerging TCCs (assistance on request for other TCCs).
- Providing the Missions and TCCs, strategic guidance and oversight by conducting a PDV to verify that provisions of the SUR/MOU are met, and the contingent is ready for deployment.

The Mission leadership supports evaluation by coordinating and providing the following assistance:

- Informs TCCs of mission-specific performance goals for the Engineer Unit, pre-deployment preparation requirements and Mission-oriented task requirements.
- Coordinates pre-deployment reconnaissance, organizes in-Mission induction training through Integrated Mission Training Centers (IMTCs), provides the training-of-trainers courses (a FHQ responsibility), provides Mission Military Engineer support, and defines unambiguous operational tasks, roles and responsibilities for the Engineer Unit that provide a basis for evaluation.
- Carries out in-Mission operational performance and capability evaluation of the contingent as and when required. Provides and coordinates the required resources and staff to conduct evaluations and centralized, technical on-the-job training to strengthen evaluated shortfalls.

[107] See: SOP on Force and Sector Commander's Evaluation of Subordinate Military Entities in Peacekeeping Operations

- Guides and supports TCCs and Engineer Units to improve shortfalls, adopt midcourse corrections and take action with the Mission command and staff on evaluation findings. Develops a Mission-specific Engineer training plan and oversees the required training to improve the evaluated operational readiness.
- Performance evaluation of the Unit Leadership at all levels.

6.5. Evaluation Standards (TSIs)

This Annex D delineates the tasks, standards, and indicators (TSI) essential for conducting thorough self-evaluation and Military Skill Validations. These TSIs assess performance by aligning with established guidelines and UN military standards, ensuring activities meet recognized benchmarks for effectiveness and compliance. Given the dynamic nature of operational environments, these TSIs may be subject to refinement. It is, therefore, imperative to consult the most current version of the TSI, which can be accessed through the

- Peacekeeping Capability Readiness System website (https://pcrs.un.org)

or the

- Peacekeeping Resource Hub (https://peacekeepingresourcehub.un.org)

Annex A - Tasking Coordination Mechanism for a UN Military Construction Engineer Unit

While the HOMC exercises “UN operational command and control” over all military units, the D/CMS, as delegated by the Head of Mission (HOM), is responsible and accountable for the effective utilization and tasking of all United Nations commercial/military mission enabling assets.

The tasking of mission enabling assets should be guided by an integrated approach to planning and resource allocation, informed by mandate priorities determined by the HOM and mission-wide priorities informed by the mission resource allocation structure, as described policy on Authority, Command and Control in United Nations Peacekeeping Operations. It is the responsibility of the HOM to ensure an accountable and cooperative approach to tasking and resource allocation in the mission.

Military Construction Engineer as a mission enabling asset are under the tasking authority of the Director/Chief of Mission Support exercised through the CSDM and Chief Engineer. The tasking priorities are based on Mission-level priorities determined by the Mission/Senior Leadership Team (MLT/SLT), of which the FC and DMS/CMS are both members. MLT/SLT are to ensure coordination and consultative decision-making on strategic and operational issues.[108]

Consultative decision-making

UN Missions generally establish standard operating procedures for such consultative decision-making governing the use of enabling units, such as Military Construction Engineers, to ensure the achievement of Mission operational priorities in support of the mission plan.

The process is supported by holding regular coordination meetings between the FC and DMS/CMS to discuss and establish engineer priorities consistent with the HOM’s guidance for mandate implementation.

The FC and DMS/CMS are assisted in these coordination meetings by their respective principal staff officers including, but not limited to, the U-4, U-5, U-8 (MILENG), CSDM, Chief Engineer, Chief of Mission Support Center, and, as appropriate, other civilian components of the mission , as well as UN Agencies Funds and Programmes, such as the UN Office for the Coordination of Humanitarian Affairs (UN OCHA), UN Development Program (UNDP), UN High Commissioner for Refugees (UNHCR), etc.

Joint Budget Preparation

As an example of this mechanism, civilian and military engineer staff confer on budget preparation, developing budgets for scheduled and anticipated projects including possible emergency engineer requirements. In such cases, the Mission Chief Engineer[109]

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[108] See: Policy on Authority, Command and Control in United Nations Peacekeeping Operations.

[109] The civilian Chief Engineer has delegated tasking authority for all overall engineering operations encompassing all the Mission’s civilian, commercial and military enablers for operations related to and including construction (horizontal and vertical) and maintenance of buildings and physical infrastructure, operation of utility services, minor engineering, etc.
See: Mission Start-up Field Guide for Mission Managers of United Nations Peace Operations

(responsible for engineering operations), will work with the Force Engineer (U-8)[110] and U-5 to identify the requirements and plan the necessary funding of their recommended projects implemented by MILENG.

Tasking Coordination Mechanism

The Military Construction Engineer Unit tasking coordination mechanism is similarly consultative and collaborative. While prioritization and tasking authority rests with the DMS/CMS (typically delegated to the CSDM and in turn to Chief Engineer), MILENGs at all levels may raise military engineer concerns and requests, as part of the overall Mission prioritization of Engineer projects.

As the tasking coordination mechanism illustrates, close coordination[111] between the military and civilian engineer components is required, particularly with respect to Task Order development and other logistic management, material provisioning[112] and task execution. Moreover, Military Construction Engineer projects are monitored throughout their life cycles by means of daily and weekly reports submitted by both military and civilian chains of command.

With some minor variation from mission to mission, Military Construction Engineer Unit tasking generally proceeds according to the following process. UN Missions are strongly encouraged to adopt similar coordination mechanisms seeking input from Military and Civilian Components to plan, budget and utilize these valuable enabling resources.

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[110] At Mission Headquarters, clear terms of reference (TOR) are developed for the Mission's civilian Chief Engineer and military Force Engineer/U-8. The MLT/SLT determines the chain of command and line of reporting for both officers. The TOR, chain of command and reporting for the Mission's civilian Chief Engineer and military Force Engineer vary from Mission to Mission depending on decisions made by the MLT/SLT. See: Mission Start-up Field Guide for Mission Managers of United Nations Peace Operations

[111] Frequent visits, discussions and meetings among Engineer units and Engineer Section helps in proper planning of availability of personnel and material/machinery on ground. Timely supervision and inspection of the working site by Engineer Section further assist in assessment and identifying further projects. A joint reconnaissance/site visit from both the team and other counterparts helps in deliberate planning of task given from higher authority. Engineer Section either at FHQ pr SHQ level, a representative together with Engineer Section in their office are to facilitate liaison and coordination.

[112] One of the basic challenges being faced by MILENG unit is timely availability of construction material. To avoid such a situation foresight and flexibility in planning is key. The coordination between Force Engineer and MILENG unit is essential for preparing Task Orders which caters for the availability of requisite material beforehand. However, there will be circumstances when the material supply will either be uncertain/delayed or not forthcoming; re-allocation of resources and shifting the focus to other tasks based on overall mission priority will therefore be essential at senior level.

Tasking Coordination Mechanism for a MILENG Construction Engineer unit for Mission- and Force-Level Military Construction Engineer Projects

Step 1 Mission Construction Engineer priorities are established by the Mission's senior management, through submission by the FC and DMS/CMS, consistent with the Head of Mission's guidance on mandate implementation.

Step 2 Based on these Mission-level priorities, construction engineer tasks are developed for specific engineer units by the Chief Engineer/Chief of Service Delivery.

Step 3 Construction engineer tasks developed for military engineer units are coordinated through the Force Engineer.

Step 4 The Force Engineer is the focal point for preparing UN Military Construction Engineer Unit Task Orders. Preliminary Task Orders are prepared consistent with Mission priorities, developed as described above, and include the details of the engineer work to be done, material requirements, administrative aspects and initial designs and drawings of the projects.

Step 5 The Preliminary Task Orders are coordinated with the Mission's Chief Engineer for review and finalization of designs and drawings.

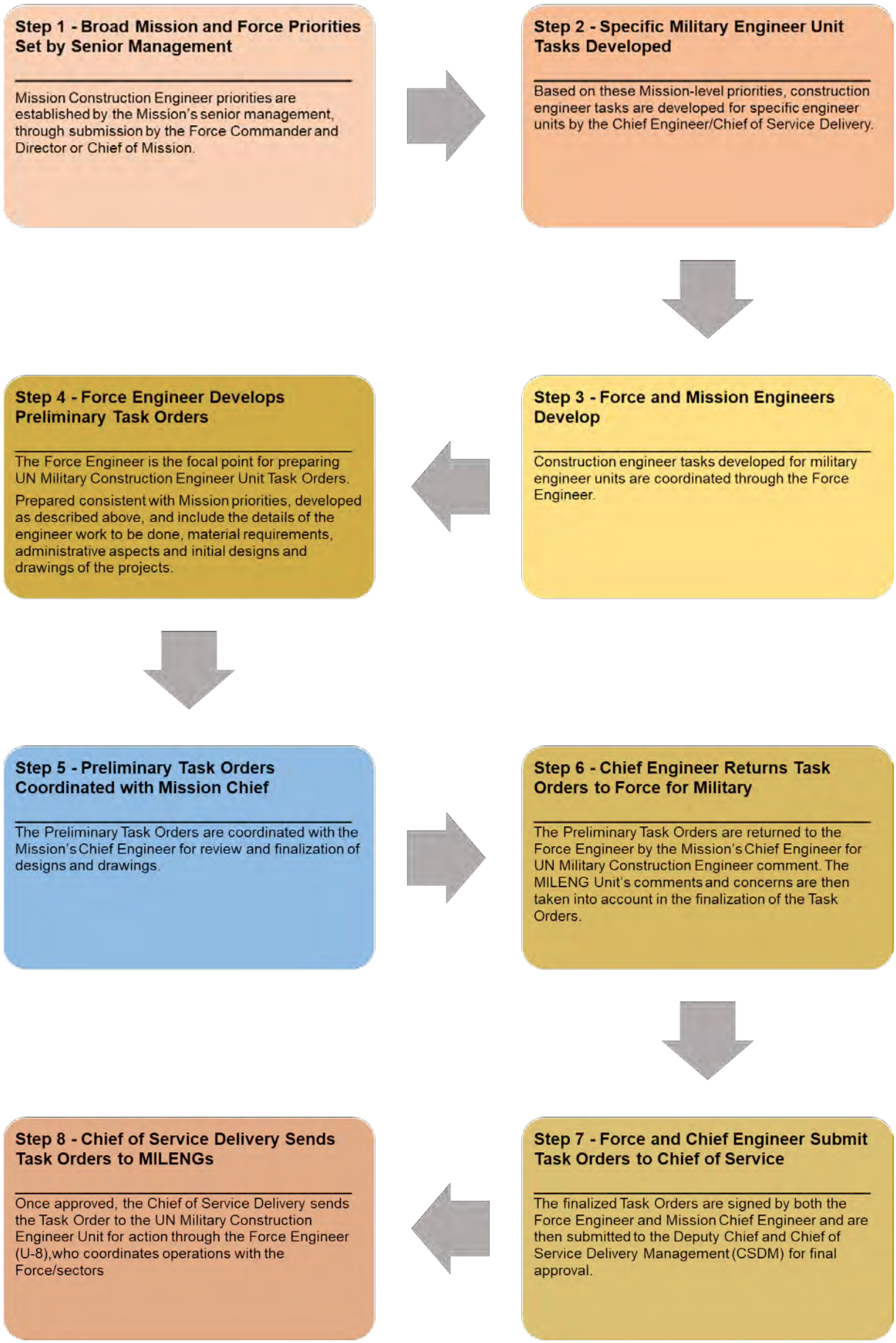
Step 6 The Preliminary Task Orders are returned to the Force Engineer by the Mission's Chief Engineer for MILENG Unit comment. The MILENG Unit's comments and concerns are then taken into account in the finalization of the Task Orders.

Step 7 The finalized Task Orders are signed by both the Force Engineer and Mission Chief Engineer and are then submitted to the Deputy Chief and Chief of Service Delivery Management (CSDM) for final approval.

Step 8 Once approved, the CSDM sends the Task Order to the MILENG Construction Engineer Unit for action through the Force Engineer (U-8). The force engineer will coordinate unit tasks with the Force and Sector HQ to ensure that operations and security are synchronized.

Note:

In the case of urgent, Mission-directed tasks to offset shortfalls in civilian contracting and hasten Mission establishment (such as developing helicopter bases, Level II medical facilities, certain accommodation, logistics bases, etc.) tasking may come to the MILENG Unit directly from the Mission Chief Engineer. However, prior to the tasking, the Chief Engineer will have closely coordinated with the Force Engineer, who will coordinate with the Force.


Step 1 - Broad Mission and Force Priorities Set by Senior Management
Mission Construction Engineer priorities are established by the Mission's senior management, through submission by the Force Commander and Director or Chief of Mission.
Step 2 - Specific Military Engineer Unit Tasks Developed
Based on these Mission-level priorities, construction engineer tasks are developed for specific engineer units by the Chief Engineer/Chief of Service Delivery.
Step 3 - Force and Mission Engineers Develop
Construction engineer tasks developed for military engineer units are coordinated through the Force Engineer.
Step 4 - Force Engineer Develops Preliminary Task Orders
The Force Engineer is the focal point for preparing UN Military Construction Engineer Unit Task Orders.
Prepared consistent with Mission priorities, developed as described above, and include the details of the engineer work to be done, material requirements, administrative aspects and initial designs and drawings of the projects.
Step 5 - Preliminary Task Orders Coordinated with Mission Chief
The Preliminary Task Orders are coordinated with the Mission's Chief Engineer for review and finalization of designs and drawings.
Step 6 - Chief Engineer Returns Task Orders to Force for Military
The Preliminary Task Orders are returned to the Force Engineer by the Mission's Chief Engineer for UN Military Construction Engineer comment. The MILENG Unit's comments and concerns are then taken into account in the finalization of the Task Orders.
Step 7 - Force and Chief Engineer Submit Task Orders to Chief of Service
The finalized Task Orders are signed by both the Force Engineer and Mission Chief Engineer and are then submitted to the Deputy Chief and Chief of Service Delivery Management (CSDM) for final approval.
Step 8 - Chief of Service Delivery Sends Task Orders to MILENGs
Once approved, the Chief of Service Delivery sends the Task Order to the UN Military Construction Engineer Unit for action through the Force Engineer (U-8),who coordinates operations with the Force/sectors

Annex B -
Equipment Requirements of a Combat Engineer Unit (Company-Size)

Note:

1. The following table serves for planning purposes, only. Details such as e.g. tracked or wheeled vehicles depend on the actual physical environment of the Mission, which are to be consulted prior. The actual numbers are to be agreed upon based on the current version of the COE Manual and in accordance with the MOU/SUR as well as operational requirements.
2. **EOD** requirements are in accordance with the UN EOD Unit Manual.
3. The **Force Protection Platoon/Element** is to be equipped with Armoured personnel carrier, plus the required armament according to the threat in the AO.
4. Major equipment (if not in the COE Manual) may be treated as a "special case" if the situation requires.
5. Items marked in green are **recommended** based on experience from Missions.

Combat Engineer Unit	Command Element	Support Platoon	Combat Engineer Platoon	SST	Remarks
Engineering vehicles					
Armoured personnel carrier engineer (wheeled or tracked)					with crew-served weapons; wheeled or tracked; mine resistant
Bulldozer, medium (D6 and 7)[113]					to construct 1km (linear) obstacles per day
Drill rig, self-propelled					depending on the tasking.
Excavator (up to 1 m3)					
Excavator (more than 1 m3)					
Firefighting truck					
Front-end loader, medium (1–2 m3)					
Front-end loader, heavy (2–4 m3)					
Front-end loader, special (more than 4 m3)					
Grader, general purpose					
Roller, self-propelled					
Truck, dump – up to 10 m3 (military pattern)					depending on the terrain in AO, a smaller more maneuverable vehicles might be more appropriate
Truck, dump – large (more than 10 m3)					
Truck, launched bridge (scissor type)					
Workshop truck, heavy engineering equipment					

[113] Bulldozer can provide limited horizontal construction capability, Increase the MOV/CMOV/SURV capabilities e.g., breaching obstacles (MOV), building anti-tank ditch (CMOV), and constructing positions (front-end loader) (SURV), etc.

Combat Engineer Unit	Command Element	Support Platoon	Combat Engineer Platoon	SST	Remarks
Engineering equipment					
Assault boat and motor (Zodiac type)					RHIB, RHIG or Assault Craft with trailer
Bridging boat					1 Infantry crossing site
Bridging sets (Bailey or equivalent, set of 100 feet)					2 bridging/ferry sites; 2x Sets of 120ft span bailley/acro bridge parts is recommended
Compactor plate					
Concrete cutter					
Concrete mixer machine, above 1.5 m3					
Concrete vibrator					
Dewatering pumps, up to 5 horsepower					
Recce (reconnaissance) boats					
Scissor/cantilever-type bridge (up to 20 m)					
Soil laboratory equipment					
Survey equipment, including total station					
Survey equipment, theodolite-type					
Water pumps					
Water treatment plant (reverse osmosis water purification unit or equivalent): equipment, tanks, and bladders, up to 2,000 liters per hour, storage up to 5,000 liters					
Armoured personnel carriers, wheeled					
Mine-resistant ambush-protected vehicle, light (6 to less than 8 kg blast anti-tank mine)					for up to 2 simultaneous MILENG reconnaissance Team
Demining, explosive ordnance and improvised explosive device disposal equipment	all material regarding EOD - see EOD Unit Manual				
Man-portable high-power electronic countermeasure (cell/GPS/jammer)					
Handheld (mine) detector (dual sensor with active metal detection and ground-penetrating radar)					
Protective apron/trousers					
Protective helmet and visor					
Protective vest/jacket					
Explosive storage/detonator box					
Firing cables (300 m)					
Firing system to initiate disruptors/charges					
Hook and line toolkit for explosive ordnance disposal					
Fibre-optic scope					Endoscope (flexible/rigid)
Electrical equipment (Generators mobile)					
51-75 k VA					
76-100 k VA					

Combat Engineer Unit	Command Element	Support Platoon	Combat Engineer Platoon	SST	Remarks
Material handling equipment					
Forklift, container					
Forklift, medium (up to 5 tons)					if feasible Telehandler
Forklift, heavy (more than 5 tons)					up to 10 tons is preferable
Forklift, rough terrain (more than 5 tons)					
Support vehicles (commercial pattern)					
Ambulance, armoured/rescue					
Truck, water (5,000–10,000 liters)					or Truck, water (5,000–10,000 liters) military pattern
Support vehicles (military pattern)					
Ambulance					excludes requirements for Level 1 Medial Equipment (see COE Manual); capable to transport min. 2 persons on a Stretcher
Jeep (4x4) with military radio					
Truck, crane (more than 24 tons)					
Truck, recovery (up to 5 tons)					
Truck, tractor (up to 40 tons tow)					
Truck, utility/cargo (1.5–2.4 tons)					
Truck, utility/cargo (2.5 to 5 tons)					
Trailers					
Bridging system					
Compressor trailer					
Fuel trailer (2,000–7,000 liters)					
Lowbed (20–40 tons)					
Trailer, floodlight set, with generators (4 lights, 9 m pole, 7 kW generator)					
Water trailer (up to 2,000 liters)					
Unmanned aircraft system					
Micro (multirotor)					up to a distance of 10 Kilometer
Mini (hand-launched)					
Force protection surveillance equipment					
Analog/digital surveillance of United Nations camps, full set					Use motion sensors, infrared cameras, and remote monitoring capabilities.

Combat Engineer Unit	Command Element	Support Platoon	Combat Engineer Platoon	SST	Remarks
Vehicles/Equipment currently not listed in COE					
Sherp vehicle					
Armored Engineer Vehicle					with option to attached blades, rollers, etc.
Measurement-Set (for topographic reconnaissance, including depth of water)					
Breaching Equipment (path)					Breaching of minefield and obstacles are to be done by: 1. Manual means of breaching 2. Mechanical means of breaching So, equipment depends on what type of method are we applying for the breaching operation.
Breaching Equipment (lane)					* Could be blade/plow/roller applied to APC (attachable to AEV)
Blast Shields and Blankets					flame-retardant / Kevlar or ballistic nylon for blast shields and blankets
Manual Breaching Tools					containing tools e.g., sledgehammers, crowbars, bolt cutters and battering rams with hardened steel
Field Fortification Tools (Sandbags, Barbed Wire, Pickaxes, and Shovels)					Use durable materials like heavy-duty fabric for sandbags, galvanized steel for barbed wire, and forged steel for pickaxes and shovels.
Vertical construction tool set					
Masonry and carpentry tool set					
Vertical laying set (surveying and laying)					
Skid-Steer Loader (with attachments)					
Compressor (with pneumatic attachments)					
Engineering Tool Set					
Floodlight set with generators					Ideally is to have trailers that could be attached to 4x4 vehicles or light trucks.
Fuel Pump					
Immersion vibrating Layer					
Thermal Imaging Devices					
Mine Probes					Produce lightweight, non-magnetic manual tools with comfortable grips.
Mine detector (Capable of measuring shape or explosive content, as well as metal content)					For military mine clearance/breaching operations
Bomb locator					
Explosive trace Detector					
Buried Wire Detector					
Demining-Kit					

Annex C -
Equipment Requirements of a Construction Engineer Unit (Company-Size)

Note:

1. The following table serves for planning purposes, only. Details such as e.g. tracked or wheeled vehicles depend on the actual physical environment of the Mission, which are to be consulted prior. The actual numbers are to be agreed upon based on the current version of the COE Manual and in accordance with the MOU/SUR as well as operational requirements.
2. **EOD** requirements are in accordance with the UN EOD Unit Manual.
3. The **Force Protection Platoon/Element** is to be equipped with Armoured personnel carrier, plus the required armament according to the threat in the AO.
4. Major equipment (if not in the COE Manual) may be treated as a "special case" if the situation requires.
5. Items marked in green are **recommended** based on experience from Missions.

Construction Engineer Unit	Command Element	Support Platoon	Vertical Platoon	Horizontal Platoon	RAF Platoon	Remarks
Engineering vehicles						
Armoured personnel carrier engineer (wheeled or tracked)						wheeled or tracked; sufficient capability for FP element
Bulldozer, light (D4 and 5)						depending on the mission a bulldozer with angle-bulldozer capabilities is recommended
Bulldozer, medium (D6 and 7)						wheeled or tracked depending on the mission environment
Bull bulldozer, heavy (D8A)						
Cherry picker crane/lift						
Compressor equipment truck						
Crane, mobile – medium (11–24 tons)						
Crane, mobile – heavy (25–30 tons)						
Crusher plant						
Drill rig, self-propelled						depending on mission
Excavator (up to 1 m3)						one vehicle should be tracked
Excavator (more than 1 m3)						one vehicle should be tracked; including hydraulic breaker
Front-end loader, light (up to 1 m3)						
Front-end loader, medium (1–2 m3)						one vehicle should be tracked
Front-end loader, heavy (2–4 m3)						one vehicle should be tracked
Front-end loader, special (more than 4 m3)						depending on mission terrain
Grader, general purpose						
Industrial tractor, light, with bucket and/or backhoe						
Road sweeper						
Roller, self-propelled						if feasible only single drum rollers

Construction Engineer Unit	Command Element	Support Platoon	Vertical Platoon	Horizontal Platoon	RAF Platoon	Remarks
Engineering vehicles						
Truck, drill rig						depending on mission requirements
Truck, dump – up to 10 m3 (commercial pattern)						
Truck, dump – up to 10 m3 (military pattern)						
Truck, dump – large (more than 10 m3)						
Truck, sewer cleaning						can possibly be contracted through Mission Support
Workshop truck, heavy engineering equipment						
Engineering equipment						
Compactor plate						
Concrete mixer machine, above 1.5 m3						
Concrete mixer machine, below 1.5 m3						
Concrete vibrator						
Dewatering pumps, up to 5 horsepower						
Sewage treatment plant and equipment						can possibly be contracted through Mission Support
Survey equipment, including total station						
Survey equipment, theodolite-type						
Water treatment plant (reverse osmosis water purification unit or equivalent): equipment, tanks, and bladders, up to 2,000 liters per hour, storage up to 5,000 liters						
Water treatment plant (reverse osmosis water purification unit or equivalent): equipment, tanks, and bladders, over 2,000 liters per hour, storage up to 20,000 liters						
Well-drilling rig						
Electrical equipment (Generators mobile)						
20-30 k VA						
51-75 k VA						
Logistics equipment						
Water storage, 5,000-7,000 litters						
Water storage, 10,001-12,000 litters						
Material handling equipment						
Forklift, container						if feasible Telehandler is recommended
Forklift, medium (up to 5 tons)						if feasible telescopic forklift is recommended
Forklift, heavy (more than 5 tons)						if feasible telescopic forklift is recommended
Forklift, rough terrain (more than 5 tons)						
Support vehicles (commercial pattern)						
Ambulance, armoured/rescue						
Buses (12 or fewer passengers)						
Truck, water (more than 10,000 liters)						

Construction Engineer Unit	Command Element	Support Platoon	Vertical Platoon	Horizontal Platoon	RAF Platoon	Remarks
Support vehicles (military pattern)						
Ambulance						decision in consultation with Medical, transport and COE
Jeep (4x4) with military radio						
Truck, maintenance – medium						decision in consultation with Medical, transport and COE
Truck, maintenance – heavy						decision in consultation with Medical, transport and COE
Truck, recovery (up to 5 tons)						decision in consultation with Medical, transport and COE
Truck, recovery (more than 5 tons)						
Truck, refrigerator (less than 20 feet)						
Truck, refrigerator (20 or more feet)						Limitation of containers above 20' due to available handling equipment
Truck, tanker (up to 5,000 liters)						Limitation of containers above 20' due to available handling equipment
Truck, tanker (5,000–10,000 liters)						Limitation of containers above 20' due to available handling equipment
Truck, tanker (more than 10,000 liters)						Limitation of containers above 20' due to available handling equipment
Truck, tractor (up to 40 tons tow)						
Truck, utility/cargo (2.5 to 5 tons)						
Truck, water (up to 5,000 liters)						
Truck, water (5,000–10,000 liters)						military or civilian pattern
Trailers						
Medium cargo, multi-axle						
Heavy cargo (20 tons)						
Flatbed (up to 20 tons)						if possible, in Pallet Loading System configuration.
Flatbed (more than 20 tons)						if possible, in Pallet Loading System configuration.
Lowbed (up to 20 tons)						
Lowbed (20–40 tons)						
Trailer, floodlight set, with generators (4 lights, 9 m pole, 7 kW generator)						
Water trailer (up to 2,000 liters)						
Water trailer (2,000–7,000 liters)						
Unmanned aircraft system						
Micro (multirotor)						

Construction Engineer Unit	Command Element	Support Platoon	Vertical Platoon	Horizontal Platoon	RAF Platoon	Remarks
Vehicles/Equipment currently not listed in COE						
Air Compressor with pneumatic implement						either pneumatic for manual work or attachable to excavator/backhoe loader to have a hydraulic breaker kit
Water Sprinkler Truck						
Sherp vehicle						for MILENG reconnaissance
Compressor (with pneumatic attachments)						
Vertical construction tool set						
Masonry and carpentry tool set						
Vertical laying set (surveying and laying)						
Skid-Steer Loader (with attachments)						
Hydraulic Breaker portable with power pack						
Portable Water Treatment Plant, up to 1,000 liters						
Pulleys and Block and Tackle Systems						
Scaffolding Systems						modular, lightweight, and durable materials like aluminum alloys.
Aerial Work Platforms (AWPs)						Ensure stability with reinforced bases and safety features.
Rope Access Gear						Use high-strength ropes and corrosion-resistant hardware.
Jacks and Hydraulic Lifting Equipment						with safety locks and overload protection.
Shoring and Bracing Systems						high-strength materials designed for easy assembly and disassembly.
Cutting Torches, Plasma Cutters, and Welding Machines						lightweight, with built-in safety mechanisms.
Safety Screens and Shields						fire-retardant materials.
Bricklaying and Masonry Tools						
Harnesses, Lanyards, Nets, and Guardrails						
NDT Tools and Load Testing Equipment						portable designs for ease of transport and accurate readings.

Construction Engineer Unit	Command Element	Support Platoon	Vertical Platoon	Horizontal Platoon	RAF Platoon	Remarks
Asphalt Works Equipment (currently not listed in COE)						
Compactor/Roller						
Asphalt Plant						for Airfield units only
Asphalt Distributor						for Airfield units only
Bitumen Distributor						for Airfield units only
Pneumatic Roller						for Airfield units only
Smooth Roller, tandem, small						for Airfield units only
Smooth Roller, tandem, medium						for Airfield units only
Road Sweeper Implement						for Airfield units only

Annex D – MILENG recommended minimum capabilities

The subsequent annex is designed to support Troop Contributing Countries (TCCs) and UN Mission planners in comprehending and incorporating engineering capabilities and mission requisites. The tables depict a **recommended minimum set of capabilities**, serving as a guiding framework for the organization, and training of engineering units. The specified timings are based on optimal conditions and should be regarded as provisional estimates; in practice, the actual processes are anticipated to require additional time for completion.

Military Engineer Reconnaissance (Recce)

Conform engineer reconnaissance teams (ERTs) to provide a wide range of engineer reconnaissance. This ERT are variable on size and scope according to the recce mission.

Recce type	Equipment	Time
Mounted	ERT with APC	100 km/day
Dismounted	ERT	5 km/day
Area survey	ERT with survey equipment	1000 m^2/day
River recce	ERT with RB (3p) or similar	1 site per day

Mobility

<table>
<tr><td rowspan="6">Breaching</td><td colspan="3">Oriented to fast troop crossing of obstacles in low security conditions:
Dismounted path – Reduce, proof and mark 2 path per Combat Engineer Platoon using manual breaching equipment.
Vehicular lane – Reduce, proof and mark 1 lane per Combat Engineer Platoon using, depending on the obstacle:</td></tr>
<tr><td>Obstacle</td><td>Equipment</td><td>Time</td></tr>
<tr><td>Minefield</td><td>ABV, plow, blade, and/or roller</td><td>5m x 120m lane
20min</td></tr>
<tr><td rowspan="2">Antitank ditch</td><td>Bulldozer, loader, and front-end loader</td><td>Close the ditch: 10min</td></tr>
<tr><td>Scissor or mounted bridge</td><td>Bridge: 30min</td></tr>
<tr><td>Small gaps</td><td>Scissor or mounted bridge</td><td>1 Bridge
30min</td></tr>
</table>

River crossing	Oriented to fast troop movement crossing rivers and other water obstacles. Install and/or operate at any given time: • **1 boat site** • **1 bridge site (Bailey or similar)** One site per day per Combat engineer Platoon

Clearing	Perform a variety of clearing tasks to clear natural and/or human-made obstacles to allow its use by UN mission or host nation. Usually performed in safe environments and equipment dependent oriented		
	Task	**Equipment**	**Time**
	Route recon and clearance	Combat Engineer Platoon with 2 bulldozers	1 km/day
	Route recon, clearance and improve	Combat Engineer Platoon with bulldozer, loader, grader, compactor and 3 dump truck	4 km/day
	Dismounted route clearance	Combat Engineer Platoon with 4 mine/metal detector	1 km/day
	Mounted route clearance	Combat Engineer Platoon on APCs or MRAPs	50 km/day
	Area clearance	Combat Engineer Platoon with ABV, bulldozer, roller or similar	5000 m^2/day
	EOD search (urban)	2 EOD specialist	70 m^2/hr

Counter-Mobility

Construct different type of obstacles vehicle or personal oriented.

Obstacle	Equipment	Time
Linear vehicle obstacle constructed (e.g., antitank ditch)	Combat Engineer Platoon with 2 bulldozers	50 m/hr
Linear pre-constructed barrier (e.g., jersey, t-wall or similar)	Combat Engineer Platoon with crane, telehandler, or forklift	25 m/hr
Point obstacle (e.g., roadblock or similar)	Combat Engineer Platoon	1 hr
Wire obstacle (triple concertina wire or similar)	Combat Engineer Platoon	100 m/hr

Survivability

Construct field and base survivability positions, fortifications and obstacles for troop and equipment protection.

Position	Equipment	Time
Berm	2 bulldozers	50 m/hr
Vehicle position	2 bulldozers	4 hr
Wire protective obstacle	Combat Engineer Platoon	200 m/hr
Company size positions (100-120 personnel)	2 front-end loader or excavator	10 hr
Pre-constructed barrier (e.g., jersey, t-wall or similar)	Combat Engineer Platoon with crane, telehandler, or forklift	25 m/hr
HESCO wall	Combat Engineer Platoon with loader, excavator, or front-end loader	20 m/hr
Water treatment	An engineer unit required to provide water should be capable to provide approx. 150 liters per person per day for 300 persons[114]	

General Engineering

Vertical construction

Work	Equipment	Time
Clearing site	Vertical Construction Platoon	500 m^2/day
Grubbing	Vertical Construction Platoon	1000 m^2/day
Excavations (foundations)	Vertical Construction Platoon	27 m^3/day
Culvert laying	Vertical Construction Platoon	10 m^3/day
Vertical construction (housing, barracks, accommodations and similar)	Vertical Construction Platoon	6 m^2/day
Vertical construction (warehouse, industrial, commercial, and similar)	Vertical Construction Platoon	10 m^2/day

[114] See: Water & Wastewater Manual for Peacekeeping & Special Political Missions in the context of field operations.
(…) bulk water, of suitable quality, should be supplied at 80 – 100 litres/person/day (…)
Drinking water, of potable quality should be supplied so as to ensure 5 litres/person/day

Road construction

Work	Equipment	Time
Maintenance	Horizontal Construction Platoon	10 km/day
Repair / Improve	Horizontal Construction Platoon	4 km/day
Construct	Horizontal Construction Platoon	0,5 km/day
Asphalt surfacing	Horizontal Construction Platoon	0,5 km/day

Airfield construction

Work	Equipment	Time
Marking and improving	Road- and Airfield Platoon	20 km/day
Repair	Road- and Airfield Platoon	8 km/day
Construct	Road- and Airfield Platoon	500 m/day
Helipad	Road- and Airfield Platoon	1 per day

Annex E – Evaluation

Annex E, Appendix 1 encompasses a comprehensive table designed for the respective Troop Contributing Countries (TCCs) to utilize in their deployment preparations. This table includes a detailed list of operational readiness factors crucial for deployment.

Annex E, Appendix 3 provides a similar table which can be used during an ongoing deployment conduct assessment by FHQs. It is important to note that Missions may adapt this list based on specific requirements, as detailed in Annex 3.

Both annexes offer an evaluation scale to assist TCCs in assessing, documenting, and addressing any identified deficiencies throughout the deployment process.

Furthermore, Annex E, Appendix 2 enumerate the tasks, standards, and indicators that the United Nations Headquarters (UN HQ) examines as part of a Pre-Deployment Visit (PDV).

For the most up-to-date Tasks, Standards, and Indicators (**TSI**), TCCs are encouraged to visit the United Nations Peacekeeping Resource Hub at

https://research.un.org

Appendix 1 to Annex E (Pre-Deployment Visit Checklists)

In view of the financial and operational significance of ensuring that contingents are correctly equipped, DPO conducts a Pre-Deployment Visit (PDV) / inspection before initial deployment. PDVs are usually conducted once the troop contributor and UN Headquarters reach a MOU agreement. This MOU covers personnel, major equipment, self-sustainment, and Mission factors, and is a contractual statement of what each of the respective parties will provide in these areas.

Suggested evaluation criteria scoring levels.

0. Not mission capable.
1. Not yet mission capable with major capability deficiencies
2. Not yet mission capable with minor deficiencies
3. Mission capable with improvements highly recommended
4. Mission capable with minor improvements recommended.
5. Fully mission capable

Serial	Evaluation Criteria	Evaluation (0 to 5)	Remarks
a.	Generic Peace Operations Skills. Are all personnel of the Military Engineer Unit trained on and sensitized to the generic UN policy guidelines and directives for conducting peace operations? Do they demonstrate a clear understanding of these guidelines and directives?		
b.	Mission-Specific Peace Operations Skills. Are all personnel of the Military Engineer Unit trained, equipped, and organized to perform MET as per peace operations norms? Is the unit capable of performing in line with Mission mandate(s)?		
c.	Basic/Conventional Skills. Is the unit trained in basic infantry skills like firing personal weapons and minor tactics in accordance with national standards?		
d.	Physical and Mental Robustness. Is the MILENG Unit physically and mentally robust enough to be deployed to the harsh conditions of the field Mission?		
e.	Core-Specific Capabilities. Is the Military Engineer Unit able to perform core tasks based on unit organization, tasks assigned and type of Mission?		
f.	Explosive Hazard Awareness. Is the MILENG Unit aware of minefield, EO and IEDs hazards or threats? Are the basic protective measures known and trained?		
g.	Organization. Is the Unit organized in task-oriented groups with support structure as per the force requirements?		
h.	Leadership. Is the unit chain of command capable, responsive, and accountable for delivering in a peace operations environment?		

i.	Command and Staff. Is the unit command and staff integrated, trained and capable of planning, organizing, coordinating, and directing the multifaceted operational and administrative tasks in the peace operations environment?		
j.	Training. Has the MILENG Unit undertaken Peace Operation and Mission-specific training? Has it achieved the requisite standards?		
k.	Resources. Is the unit carrying or in possession of the required number of personnel, arms, ammunition, equipment, accessories, spares, unit stores and expendables as per MOU and Mission requirements?		
l.	Equipment Maintenance/Management. Does the unit maintain a minimum serviceability state of 90 percent, and does it have the capability to organize preventive maintenance and repair/recovery in situ?		
m.	Weapons, Instruments and Vehicles. Are all weapons zeroed, instruments calibrated, vehicles maintained and inspected and certified for correctness and functionality as per required standards?		
n.	Logistics. In case of deployment at more than one location, are the forward deployed elements configured for independent and self-sustained logistics capability (food, water, accommodation, hygiene and sanitation, transport, and medical), or do they receive this support from the hosting headquarters?		
o.	Medical. Do all personnel meet the requisite medical standards? Have they been inoculated as per Mission requirements, and have they cleared the periodic medical examination? Does the unit have access to a fully operational medical facility (Medical Level I) in accordance with the MOU?		
p.	Integrity. Are all unit personnel aware of applicable UN rules, regulations, and code of conduct, and have they demonstrated high standards of professionalism and integrity?		
q.	Morale and Motivation. Are all unit personnel well motivated to operate in a complex, restrictive, multinational, and multidimensional environment while maintaining high morale?		
r.	Welfare. Does the unit maintain high standards of personnel welfare as per national standards and Mission requirements?		
s.	Legal. Do unit personnel and commanders clearly understand the responsibility to adhere to, promote and protect the legal framework for UN peace operations with specific reference to SOFA/SOMA, ROE, Human Rights and Humanitarian Law, other relevant international legal statutes, and the Host Nation law?		

t.	Evaluation. Has the unit carried out a formal evaluation? Have shortcomings been rectified? Have TCC authorities certified the unit to be fit for deployment to the Mission on time?		
Additional Comments			

Note

The Military Engineer Unit Tasks, Conditions and Standards Appendix provides general guidance and recommended basic performance standards to assist TCCs in the Force Generation of the desired military engineering capabilities.

Appendix 2 to Annex E (MILENG Tasks, Standards & Indicators)

MILENG Unit Function 1: Personnel / Administration

Description: This section is responsible for personnel administration, welfare, morale, motivation, and maintaining conduct and discipline in the unit. The section ensures adherence to the UN code of conduct and supports the commander to maintain and manage Conduct & Discipline related issues.

UN Military Engineer Unit Function 1: Personnel / Administration		
Number	Standards	Indicators
Sub-Task - F1.1 Personnel / Administration		
F1.1.1	Personnel administration of the unit is guided by Mission SOPs.	1. Engineering Unit's SOPs are written in the native language and in English.
		2. Personnel reporting procedures are covered in Engineering Unit SOPs.
		3. Conduct and discipline procedures are covered in Engineering Unit SOPs.
		4. Contingent leave policy is covered in Engineering Unit SOPs.
		5. Welfare measures are covered in Engineering Units SOPs.
		6. The SOP is updated and signed by Contingent Commander and not older than unit arrival date.
		7. Job descriptions are available for all functions in the unit. (Comment: Are the Job Descriptions in English language, put into the UN template, using the current naming conventions, and containing the necessary pre-deployment skills? Has every single member of the Unit/Sector signed a personal copy of their job description?)
F1.1.2	The engineering Unit maintains, reports, and records the operational strength status of the unit.	1. Daily/Weekly unit strength reports are provided to Sector/ Force HQs.
		2. The personnel section maintains the clear status of all unit personnel including the deployed locations.
		3. Subordinated units report the daily strength status of all soldiers.
		4. Personnel section reports critical shortfalls regarding personnel to Unit Commander
		5. The Unit's authorized strength is in line with the MOU.
		6. The unit's operational strength (actual strength) (MML, i.e., 75%) in line with the specific field missions SOP is maintained at all locations of the Engineering Unit.
		7. Repatriations/rotations of personnel before the end or at the end of the normal tour of duty are correctly recorded and documented.

F1.1.3	The Unit meets UN specific gender strategy requirements.	1. ___% of all deployed contingent. pers. are females (10% in 2023, 11% in 2024 and so on till 15% in 2028). Ref.: Uniformed Gender Parity Strategy 2018-2028, DPO.
		2.Female soldiers are employed and operating in the unit as per their assigned function. (Comment: Question female soldiers.)
		3. Female soldiers have been assigned mentors in the contingent. (Comment: Question female soldiers.)
		4. The Unit has a trained Gender Focal Point.
		5. The Engineering unit has an Engagement Staff Section including an engagement/public information officer and interpreters.
		6. Commanders are aware of the FC's Gender responsive document and conforming to its intent.
		7. Unit leadership ensures gender training and awareness is being conducted at regular intervals. (Comment: Question gender advisor/Focal point.)
F1.1.4	Physical requirements are in place according to UN gender strategy.	1. Separate accommodation, showers and toilets are available for female personnel.
		2. Women's ablution and washrooms are in close distance to their accommodation.
		3. Safety lighting is installed around all camps to ensure safe movement of personnel at night.
		4. Suitable accommodation for women to allow full access, able to travel and operate in all areas in the mission is available.
		5. Women have access to female sanitary products and there are disposal points for sanitary products in the ablutions.
		6. Women have access to protection equipment and uniforms that are gender responsive.
F1.1.5	Contingent personnel meet UN specific requirements.	1. The contingent has no personnel under 18 years of age.
		2. The contingent has no personnel older than 55 years of age (excluding ranks above Lt Col/Senior Warrant Officer).
		3. Key personnel of the unit is capable to communicate in English with higher levels of Command.
		4. Personnel on the platoon level can communicate in the Mission language (e.g., English, French).
		5. Personnel in specialized functions are well trained in their skills. (Comment: Check with S1 for duty record/training records of maintenance, medical, kitchen, operators of engineer equipment, specialists, and interview 1 of each group to verify.)

F 1.1.6	The unit has an Engagement/liaison Section to support civil-military cooperation (CIMIC) efforts.	1. The Engagement Section includes an engagement/public information officer and interpreters.
		2. The Engagement Staff Section coordinates with the Force/Sector U-9 and other Mission components to undertake appropriate engagement activities with the local population.
		3. The Engagement Section coordinates with mission partners (UN agencies, NGOs, host nation authorities) to identify and address the need for CIMIC support.
		4. The unit's SOP includes the roles and responsibilities of the Engagement Section in supporting CIMIC activities.
		5. The Engagement Staff Section conducts confidence-building measures, community projects, civil-military cooperation/quick impact projects (CIMIC/QIP), welfare activities, public information, and key leader engagement with the local population in line with FHQ CIMIC plan.
		5. The unit provides technical expertise and capacity building support to local authorities and communities as part of overall CIMIC efforts of FHQ.
Sub-Task - F1.2 Conduct & Discipline and SEA prevention		
F1.2.1	Understanding of SEA prevention and UN standards of Conduct. (Comment: A minimum requirement 5% of the overall contingent strength must be questioned.)	1. All unit members questioned can explain the UN standards of conduct.
		2. All unit members questioned can explain the prohibitions against SEA and sexual relationships with members of the local population.
		3. All unit members questioned demonstrate awareness of the possible consequences of SEA for troops, victims, the TCC and mission/UN.
		4. All unit officers and senior NCOs (Staff sergeants and above), and all other unit members questioned, know, and can explain the process/procedure/appropriate reporting channels for reporting suspected misconduct.
		5. All unit personnel carry the “No Excuses” card and the “Ten Rules: Code of Conduct for Blue Helmets” translated into the unit’s native language.
		6. There are visible awareness-raising messages (e.g., posters, regular town halls) regarding SEA prevention and UN Code of Conduct present in the Unit.
		7. Unit commander and subunit commanders coordinate with other stakeholders working on Conduct and Discipline and prevention of SEA (PSEA) in the AOR.
F1.2.2	The Unit includes deployed personnel authorized and trained to serve as National Investigation Officers (NIOs). (Comment: Only applicable if unit has deployed NIOs.)	1. The NIO is formally authorized to obtain DNA samples of contingent members who are alleged to have committed SEA for criminal, military judicial, or administrative action. (Comment: Authorization needs to be documented.)
		2. The NIO is formally authorized to obtain DNA samples of contingent members against whom there is a claim for paternity and/or child support. (Comment: Authorization needs to be documented.)

		3. The NIO is formally authorized to obtain DNA samples of mothers and children as relevant to their investigations. (Comment: Authorization needs to be documented.)
		4. There is a written document that the NIO has received training on UN code of conduct, including SEA.
		5. Units of over 300 authorized strengths are required to deploy 2 NIOs, for units below 300 authorized strength 1 NIO. (Comment: Check against authorized strength in the MOU.)
F1.2.3	The Unit has a plan on the prevention of UN standards violations on conduct, including the zero-tolerance policy on SEA.	1. The unit commander has a written plan in place for preventing misconduct in line with Mission/Force/Sector PSEA Action Plan.
		2. The unit has identified areas vulnerable to SEA cases and the preventive measures.
		3. The plan is aligned with FHQ and approved by the Force Commander.
		4. The plan is coordinated with the Conduct and Discipline team.
		5. The plan identifies priority misconduct risks, and measures to mitigate these risks.
F1.2.4	The unit commander has control measures to prevent misconduct (violations of UN standards of conduct, including the zero-tolerance policy on SEA and sexual harassment).	1. The unit commander and all sub-unit commanders maintain a record showing they communicate on conduct and discipline to those under their command on a regular basis (at least monthly), including on the standards related to SEA.
		2. Where personnel are deployed to Temporary Operating Bases or other remote locations, the unit commander conducts regular (monthly) visits to ensure adherence to UN standards of conduct.
		3. The unit and sub-unit commanders demonstrate that they are actively monitoring the plan and measures to mitigate the risk of misconduct.
		4. The unit commander maintains records and decisions of all disciplinary cases in the unit.
		5. Unit commander and sub-unit commanders have a clear understanding of the procedure to deal with/administer the violation of conduct and discipline and SEA cases.
		6. Appropriate action has been taken to address the violation of conduct and discipline and SEA cases. (Comment: N/A if no case)
		7. The unit has appointed a PSEA Focal Point, who collaborates with other stakeholders for prevention of misconduct indiscipline.

F1.2.5	Unit personnel adhere to UN standards of conduct and discipline incl. SEA.	1. During the reporting timeframe, no contingent member was repatriated because of disciplinary issues.
		2. During the reporting timeframe, no violation of the UN standards of conduct of a current contingent member is documented. All instances involving possible misconduct have been timely reported and handled in accordance with applicable procedures.
		3. During the reporting timeframe the Engineering Unit Commander and personnel cooperated during investigations. (Comment: N/A if no investigations)
		4. The unit commander conducts own investigations on cases of misconduct and penalizes contingent members that are found guilty (in accordance with authorization by national law). (Comment: Records to be presented. N/A if no cases.)
		5. All cases of misconduct allegations and investigations are documented incl. the outcome (sentence). (Comment: Records to be presented. (N/A if no allegations or investigations))
		6. In cases of misconduct with an impact outside the contingent/unit have been reported through the established process.
Sub-Task - F1.3 - Safe Driving		
F1.3.1	Unit personnel adhere to UN standards of safe driving.	1. During the reporting timeframe no traffic violations (with contingent members at fault) have been recorded by FPM/MP. (Comment: Obtain information from FPM/MP, Sector HQs Operations Centre.)
		2. During the reporting timeframe no traffic accidents (with contingent members at fault) have been recorded by FPM/MP. (Comment: Obtain information from FPM/MP, Sector HQs Operations Centre.)
		3. Drivers and operators are certified (driver's license or course completion certificate) for military pattern, armored, specialized and heavy vehicles. (Comment: Conduct spot checks for driver's license and certificates for different vehicle categories.)
		4. A system is in place to ensure that drivers are rotated when driving over longer distances/ for longer time periods. (Comment: Note that driving over longer periods can result in lapses in concentration.)

		5. The unit has an officer responsible for managing vehicles, tasking, drivers, licenses, safe driving measures in accordance with mission specific guidelines. (Comment: Does the Transport Section operate from a set of locally produced Standing Orders, covering the management of vehicles and drivers, reflecting local procedures? Does the Transport Section operate a satisfactory system to coordinate and control vehicle tasking and movement in accordance with mission procedures?)
		6. The unit traces traffic violation cases, conducts investigations (also in cooperation with local authorities and MP) and takes disciplinary measures if required (e.g., gross negligence). (Comment: Check unit records. If no existing cases - N/A.)
F1.3.2	The unit has implemented a Road Safety Program.	1. The unit has clearly documented safety regulations and Standard Operating Procedures (SOPs) which are understood by drivers and vehicle occupants. These measures must be strictly enforced (e.g., speed limits, use of seat belts, alcohol control, vehicle breakdown drill). (Comment: Does the Transport Section utilize the UN Drivers Handbook and ensure their drivers are familiar with its contents?)
		2. Training, testing and certification of drivers to operate vehicles in all weather conditions, during night and low-visibility and over rough terrain replicating conditions in the AOR. (Comment: Initial training conducted prior to deployment and repeated as refresher training during deployment-check records.)
		3. The unit uses assistant drivers in vehicles where applicable.
		4. Drivers know how to respond to accidents, perform self-extraction, operator-level emergency repairs, report on accidents, breakdowns, and faults, provide first-aid and attend to injuries en-route. (Comment: Question vehicle operators for an assessment.)
		5. Vehicle operators of the unit are performing daily Preventive Maintenance Checks and Services (PMCS) prior to the operation of any vehicle, recording checks and services in logbooks assigned to the vehicle.(Comment: Conduct spot check with vehicle operators-PMCS as a minimum shall include a quick visual inspection and walk-around of the vehicle to ensure that the tires are properly inflated and that brake, signal lights, headlights are working properly, and no obstructions or personnel are obstructing vehicle movement; petroleum, oil and lubrication levels are at the full level.)
		6. All vehicles are equipped with emergency repair and towing equipment, fire extinguishers, emergency triangles and first aid equipment.

Sub-Task - F1.4 Welfare		
F1.4.1	The unit has the required equipment, infrastructure, and processes to provide effective welfare for its members.	1. No shortfalls regarding the Self Sustainment category of Catering categories are identified in the last COE verification inspection.
		2. No shortfalls regarding the Self Sustainment category of Welfare such as sports facilities, phone facilities etc. are identified in the last COE verification inspection.
		3. No shortfalls regarding the Self Sustainment category of Internet Access are identified in the last COE verification inspection.
		4. Recreational space/ facility is available and responds to women and men's needs.
		5. Entertainment facility, TV, religious facilities, library, indoor/outdoor sports areas are available. (Comment: How does the unit account for Welfare items?)
F1.4.2	The unit has implemented procedures to ensure the welfare of its members.	1. The unit has documented leave plans as per UN regulations for the contingent. (Comment: Does the unit have a system for registering and planning annual/compassionate/recreational leave?)
		2. Temporary deployments at remote locations should not exceed 30 days (unit members are rotated at these locations).
		3. All Unit and sub-unit commanders have implemented and documented a duty system allowing for rest and recuperation.
		4. The unit has a documented welfare plan and program for unit members (e.g., game nights, sport competitions, movie nights).
		5. The unit has a system in place to inform all personnel (e.g., current situation, incidents, upcoming events) to avoid speculation, rumors, and frustration.
		6. The unit has established a designated counsellor for contingent members to raise problems and concerns.
UN Military Engineer Unit Function 1: PERSONNEL/ADMINSTRATION (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Function 2: Engineer Unit Situational Awareness

Description: The Engineer Units should be capable of pro-actively acquiring, processing, analyzing (including the use of early warning indicators) and communicating tactical information at the unit level; and maintaining 24/7 situation awareness with dedicated staff and multiple resources for planning and executing Engineer tasks and force protection. The situational awareness section is to coordinate tactical information acquisition, collation, corroboration, and dissemination for effective situation awareness throughout the unit.

UN Military Engineer Unit Function 2: The Engineer Unit Situational Awareness		
Number	Standards	Indicators
F2.1		
F2.1.1	The Engineer Unit Situation Awareness staff section demonstrates awareness of the physical terrain in its Area of Operation and its potential impact on unit operations to achieve the mandate.	1. All routes throughout the unit Area of Operation, including roads, tracks and likely transit routes used by UN forces and other actors are identified and classified based on capabilities and conditions such as vehicle type, general road conditions are depicted in an Overlay. (Comment: This overlay is known as the Mobility Corridor Overlay.)
		2. The terrain has been labelled UNRESTRICTED (Terrain over which movements of UN forces or other actors is not affected by the ground, vegetation, natural and man-made obstacles), RESTRICTED (Terrain over which movements of UN forces or other actors is only possible at reduced speed, is canalized, or will be possible only with the assistance of additional non-organic assets like improvised bridges or obstacle crossing task is required, e.g., steep ground, swamps / river beds etc.), SEVERELY RESTRICTED (Terrain over which movements of UN forces or actor groups being assessed as impractical e.g., rivers that cannot be crossed/forded, known minefields) and is depicted in an Overlay.
		3. Pertinent Infrastructure in the Area of Operation of the Engineering Unit is depicted in an Overlay. E.g.: Sanitation (including sewerage, Water supply (including wells, water purification or de-salinization plants); Power supply; Refugee camps or key NGO facilitation areas; major airports, helipads, and their conditions.
		4. The Engineer Unit Situation Awareness staff section has identified terrain/ ground that provides an advantage to either UN-opposing or UN forces towards the completion of a mission (but is not critical to mission success) and depicted these areas in an overlay (Key Terrain (KT)). (Comment: Depending on the type of the mission these could be high grounds, areas with good observation points and fields of fire, key infrastructure (such as bridges, river crossing points, intersections, industrial complexes) and their conditions.)

		5. The Engineering Unit Situation Awareness staff section has identified and maintains separate overlays on the impact of weather/seasonal conditions on routes, river courses, areas of cover (such as vegetation growth).
F2.1.2	The Engineering Unit Situation Awareness staff section demonstrates awareness of the human terrain in its Area of Operation in relation to the mandate.	1. The Engineering Unit Situation Awareness staff section has depicted in overlays all ethnic, religious (incl. religious sites), political and tribal group locations and identified vulnerabilities of each group within its Area of Operation.
		2. The Engineering Unit Situation Awareness staff section has identified all armed groups, terrorists, and organized crime groups in its Area of Operation and depicted (in separate overlays) known locations (along with their capability, structure, and intent, their attitude to the UN, their links with other groups, and their key leaders).
		3. The unit has identified and depicted in an overlay all locations of Host Nation Security Forces and institutions (including structure, capabilities and contact details of key personnel).
		4. The Engineering Unit has identified locations (depicted in an overlay) and strength of refugees and IDP (internally displaced persons) and actors providing humanitarian assistance such as NGOs in their Area of Operation.
		5. The Engineer Unit has identified political organizations and key leaders in their Area of Operation.
		6. The Engineer Unit has identified in list individuals, equipment and infrastructure which are assessed as being significant to both (threat) actors and UN forces for the completion of their respective Engineer task(s)/ intent (Items of High Importance List (IHI List)).
		7. The unit assesses if the armed elements use of mine, EOD, IED, and existence of the Explosive Remnant of War (ERW) in the AOR.
F2.2 - Direction & Acquisition		
F2.2.1	The Engineer Unit Situation Awareness staff section manages Information acquisition	1. Incoming information related to Engineer Units tasks is also visually depicted on maps, charts, and overlays. (Comment: Check Situation and Incident Maps.)
		2. The Engineering Unit Commander receives INTREPs and INTSUMs (daily, weekly, and monthly) from higher headquarters and updates the unit's security information.
		3. The Engineer Unit receives information or assessments on the accessibility of the main supply roads and infrastructures.
		4. The unit analyses if the Armed Groups are using any types of explosive ordnance (EO) during the confrontation or the possibility of use of explosive ordnance, like UXO, AXO or IEDs in the AOR etc.

F2.3 - GIS Support to Engineering Operations		
F.2.3.1	Unit leverages GIS technologies and geospatial information to enhance and augment its overall situational awareness.	1. The unit has personnel trained in the use of GIS software and geospatial data management.
		2. The unit leverages GIS capabilities to conduct terrain analysis, route planning, infrastructure mapping, and other spatial assessments to support engineering tasks.
		3. The unit integrates GIS data and analysis into its planning and decision-making processes for engineering operations.
		4. The unit coordinates with mission GIS/geospatial support elements to access and utilize relevant geospatial information.
		5. The unit contributes to the maintenance and updating of the mission's geospatial database with information collected during engineering activities.
		6. The unit provides GIS-based products and analysis to support the information requirements of higher headquarters and other mission components.
UN Military Engineer Unit Function 2: The Engineer Unit Situational Awareness. (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Function 3: Operations and Engineer Planning

Description: The unit's operations staff section is responsible for planning, organizing, staffing, directing, controlling, and sustaining all operations and administrative responsibilities of the unit in accordance with unit and Force standard operating procedures. The section coordinates all operational activities and movements within the area of responsibility, carries out liaison, maintains the Engineer Unit's 24/7 Operations Center. They coordinate employment of Quick Reaction capability in accordance with the operational situation. It is their responsibility to ensure the overall safety and security of personnel, materiel, and information in the unit. The section establishes and maintains liaison with neighboring contingents and the immediate higher headquarters and/or engineer section/CSDM for coordination and control of activities.

UN Military Engineer Unit Function 3: OPERATIONS AND ENGINEER PLANNING		
Number	Standards	Indicators
F3.1 - Planning and Mandate implementation		
F3.1.1	The UN Engineer Unit has created an understanding on how the mission/ mandate is to be implemented based on the guidance received from Higher HQs.	1. The Engineer Unit has analyzed the mandate; it's given missions in combination with the Force and Sector Commanders Intent.
		2. The Engineer Unit has identified all specified tasks and implied tasks and determined all Mission Essential Tasks (Comment: Implied Task: Something that is not specified by higher HQ in the original order that needs to be carried out to achieve the mission/ implement the mandate. Mission Essential Task: A task that if not included in the plan could cause the unit to fail in its mission/ implement the mandate).
		3. The unit has determined the assets available to execute the Engineering tasks.
		4. The unit has identified all limitations (constraints/restraints) or shortfalls to execute Engineer tasks.
		5. The unit coordinates for necessary support such as Force Protection, and Transportation support etc. with higher headquarters.
		6. The unit commander has outlined in writing on how he is intending to implement the engineering tasks (Commanders Intent).
F3.1.2	The UN Engineer Unit Commander has developed a plan to effectively implement the mission/mandate.	1. The plan has a clear purpose and addresses all aspects of the mission/ mandate, higher HQs guidance, limitations, and tasks. (Completeness).
		2. The plan outlines how the Engineer Unit will implement the mission/ mandate in the concept of operations.
		3. The plan describes the Combat Engineering Tasks that the Engineer Unit will execute.
		4. The plan describes the Construction Engineering Tasks that the Engineer Unit will execute.

		5. The plan describes critical times (when certain actions will be carried out).
		6. The plan defines crucial decisive geographical locations (where it matters most) where military effects will be achieved based on the understanding of the operations area.
		7. The plan describes the availability of local engineering resources (feasibility).
F3.1.3	The unit has a coordination plan with Mission and Force Engineer to mitigate unit's shortfalls.	1. The unit commander prioritizes the Engineering tasks based on the mission.
		2. The unit commander liaises and coordinates with Force Engineer and Mission Engineers to fill the unit's shortfalls for executing given Engineering Tasks.
		3. Coordinate and plan with entities for detailed activities to fulfill engineering tasks.
		4. The Unit Commander maintains the information of the database and presents the same to mission leadership.
F3.2 - Command & Control		
F3.2.1	The Military Engineer Commander exercises effective command and control.	1. The unit commander exercises sound and timely decision-making.
		2. Guidance and orders are clear, simple, concise, and based on developed plans and/or situation development.
		3. The unit commander ensures that all operations of the unit are coordinated and integrated with other UN and Host Nation actors whenever advantageous for a mission/mandate implementation.
		4. The unit commander seeks responsibility and is willing to take the initiative.
		5. The unit commander ensures unity of command by establishing clear responsibilities and tasks for subordinate units.
		6. The unit commander ensures that assigned tasks are understood, supervised, and accomplished (conducts briefing, debriefing, and operational rehearsals).
		7. The unit commander ensures that the subordinate units/elements have the required capabilities to implement those assigned tasks.
F3.2.2	All operations are conducted in accordance with documented orders and are continuously monitored.	1. Orders are based on guidance received from higher HQs (SHQs/FHQs) or situation developments. Orders are clear, simple, and concise.
		2. Correct sets of orders (OPORD, FRAGO etc.) are used, and orders are coordinated with other staff functions.
		3. The unit's operations room is set up to monitor the unit's daily operational activities 24/7.
		4. Mobile operation or sub-units' operation out of the main camp of the unit (e.g., road construction) are tracked (waypoints/reporting lines/locations) on the Situation Map.

		5. All incoming/outgoing orders are documented and filed. (Comment: Conduct a spot check.)
		6. The commanding officer and his staff continuously monitor and assess the unit's operational situation and progress made, adjusting the scheme of maneuver, as required.
F3.2.3	The unit collects, analyses, and disseminates reports.	1. The Engineer Unit provides comprehensive reports to higher HQ after completion of each task. It should include the latest information and an assessment of the incident with pictures/sketches in accordance with mission SOPs.
		2. The operations (S3) section collects, analyses, and disseminates operational reports timely to higher HQs as per mission-specific SOPs. (Location, tasks performed, details of work, progress etc.).
		3. Reports from subordinated units are recorded and transferred to the Operations map.
		4. All reporting (including procurement report if applicable) must be completed on time.
		5.Search teams fills out a comprehensive Search Report with correct Grids, Areas, Search Methods, Sketches and Findings.
F3.2.4	The unit has established a process to continuously improve its effectiveness.	1. The Engineer Unit conducts After-Action Review (AAR) with team members after completion of each task and identifies Lessons Learned (What worked, what did not work, recommended training, equipment, or supplies required).
		2. Sub-unit commanders deliver a debrief to the Engineer Unit commander on the result of the task execution.
		3. Findings of after-action reviews and debriefings are recorded and used to identify best practices and make necessary adjustments (e.g., revised tactics, techniques, and procedures)
		4. Best Practices and Lessons Learned are shared with higher HQs for distribution to other units.
		5. Performance improvement plans and measures taken are recorded and reported to higher HQs.
F3.3 - Use of force and compliance with international human rights and humanitarian law.		
F3.3.1	The unit has implemented measures to ensure compliance with Mission specific ROEs. Ref.: Mission ROEs	1. There is a unit ROE SOP, drawn from the Force SOP, and this SOP is disseminated to all sub-unit commanders.
		2. All unit personnel have been issued with mission-specific ROE pocket cards and every personnel carries it with him/her. (Comment: Spot Check)
		3. Application of ROEs based on the specific task and the likely threat scenarios are always part of order briefings on all levels.
		4. ROE cards are translated into the native language of all personnel.

		5. All applications of the Use of Force (6 points) are reported and recorded in the Operations Log.
F3.3.2	The unit personnel demonstrate a clear understanding of basic ROE principles. (Comment: Conduct Interviews with personnel of all ranks.)	1. Soldiers can explain the principle of Self-Defence.
		2. Soldiers can explain the principle of Use of Force other than in Self-Defence;
		3. Soldiers can explain the principle of Duty to Identify Target(s)-Observe Fire.
		4. Soldiers can explain the principle of Duty to Challenge and Warn.
		5. Soldiers can explain the principle of Duty to Use Minimum and Proportional Force.
		6. Soldiers can explain the principle of Avoidance of Collateral Damage.
		7. Soldiers can explain the principle of Rules and instructions to deal with detainees.
F3.3.3	The unit has implemented frequent ROE training for all unit personnel.	1. Scenario-based training is conducted based on likely mission-specific incidents.
		2. Training is conducted monthly and documented (incl. participants).
		3. Training is conducted separately for unit key leaders/ subordinated commanders and soldiers.
F3.3.4	The unit upholds human rights and the principles of international law including international human rights and humanitarian law during the planning and conduct of operations.	1. The unit incorporates considerations of international law including international human rights and humanitarian laws into the planning of operations.
		2. The unit conducts regular training on the international human rights and humanitarian law (Comment: Check with training records (schedule and attendance).)
		3. The unit personnel exercise individual self-defense in response to a hostile act or demonstrated hostile intent. (Comment: Check against ROE reporting of the unit.)
		4. If time and circumstances permit, unit personnel attempts to de-escalate the situation. (Comment: Check against ROE reporting of the unit.)
		5. There is no record of human rights violations of the unit.
		6.When unit personnel respond to a hostile act or demonstration of hostile intent, the force used in self-defense is proportional. (Comment: Check against ROE reporting of the unit)
F3.4 - Caveats		
F3.4.1	The unit has supported planning and conduct of all tasks assigned by higher HQs.	1. The Engineer unit commander has never refused a task or the timely execution of it, which was in line with the SURs (e.g., because of national regulations/ policies.)
		2. The unit has never imposed limitations or restrictions when conducting or planning for an assigned task (within SUR).

		3. The unit has never refused to conduct a task (within SUR)
		4. The unit or TCC has never requested/ informed UNHQs or the Mission that the unit cannot perform a task which was in line with the SUR or the application of UN regulations, procedures, and Mission SOPs.
		5. The unit never acted on national direction or instruction.
		6. When receiving instructions from national authorities, the unit immediately informed their United Nations chain of command.
F3.5 Support to Protection of Civilians (PoC)		
F.3.5.1	Unit supports the Force HQs plan to assure Protection of Civilians (PoC)	1. The unit's engineering projects and infrastructure support (e.g., roads, bridges, shelters, water/sanitation facilities) are designed and implemented with a focus on improving the safety and security of local communities.
		2. The unit coordinates with the mission's human rights, PoC and civil affairs components to identify and address the engineering-related risks and needs for the protection of civilians.
		3. The unit's engineering activities contribute to improving the living conditions and access to essential services for local populations, thereby supporting the mission's PoC mandate.
		4. The unit's engineering plans and activities are aligned with the mission's overall PoC strategy and priorities
UN Military Engineer Unit Function 3: OPERATIONS AND ENGINEER PLANNING (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Function 4: Sustainment

Description: The Logistics Staff Section includes a Logistics Officer, logistics staff and a contingent-owned equipment (COE)/finance officer. The section coordinates logistics support for the unit in accordance with MOU arrangements to plan, provision, stock, and turnover inventory; replenish supplies and stores; and repair, replace and manage equipment. The section ensures timely maintenance, serviceability, and inspection of both contingent-owned and UN equipment in the unit's care. It also manages the unit's financial and accounting transactions. The Logistics Officer oversees the Engineer Unit's movement control for in-Mission movement as well as unit rotations and acts as the environmental focal point.

UN Military Engineer Unit Function 4: SUSTAINMENT		
Standard	Standards	Indicators
F4.1 - Equipment readiness and serviceability		
F4.1.1	Weapons, ammunition, and Personal Protective equipment are available and serviceable.	1. All soldiers are equipped with personal weapons, combat helmet (with blue cover) and basic flak jacket. (Comment: Conduct spot checks.)
		2. Based on the last COE verification inspection 90% or more of ARMAMENTS are available and serviceable.
		3. Armaments are enough to perform ALL assigned tasks without limitation. (Comment: Written comments according to evaluator assessment are required.)
F4.1.2	The UN Engineer Unit's vehicles are available and serviceable.	1. The last COE verification inspection has identified that 90% or more of the ENGINEERING VEHICLE category equipment is available and serviceable.
		2. The last COE verification inspection has identified that 90% or more of the MATERIAL HANDLING EQUIPMENT category are available and serviceable.
		3. The last COE verification inspection has identified that 90% or more of the TRAILER category are available and serviceable.
		4. The last COE verification inspection has identified that 90% or more of the SUPPORT VEHICLES category are available and serviceable.
		5. Vehicles are enough to perform ALL assigned tasks without limitation. (Comment: Written comments according to evaluator assessment are required.)
F4.1.3	The UN Engineer Unit's communication/intelligence related equipment is available and serviceable.	1. The last COE verification inspection has identified that 90% or more of the COMMUNICATIONS/INTEL category are available and serviceable.
		2. The last COE verification inspection has identified the Self Sustainment category of VHF/UHF-FM available and serviceable.
		3. The last COE verification inspection has identified the Self Sustainment category of HF are available and serviceable.

		4. The last COE verification inspection has identified the Self Sustainment category of TELEPHONE are available and serviceable.
		5. The last COE verification inspection has identified the Self Sustainment category of IDENTIFICATION are available and serviceable.
		6. The last COE verification inspection has identified the Self Sustainment category of OBSERVATION is available and serviceable.
		7. The last COE verification inspection has identified the Self Sustainment category of NIGHT OBSERVATION is available and serviceable.
		8. The last COE verification inspection has identified the Self Sustainment category of POSITIONING is available and serviceable.
		9. Communication/intelligence related equipment is enough to perform ALL assigned tasks without limitation. (Comment: Written comments according to evaluator assessment are required.)
F4.1.4	The UN Engineer Unit's Equipment supporting assigned tasks is available and serviceable.	1. The last COE verification inspection has identified that 90% or more of the ENGINEERING EQUIPMENT category are available/ serviceable.
		2. The last COE verification inspection has identified the Self Sustainment category of MINOR ENGINEERING is available and serviceable.
		3. The last COE verification inspection has identified that 90% or more of the GENERATOR category are available/ serviceable.
		4. The last COE verification inspection has identified that 90% or more of the DEMINING/ EOD category are available/ serviceable.
		5. The last COE verification inspection has identified the Self Sustainment category of EOD is available and serviceable.
		6. The last COE verification inspection has identified that 90% or more of the WATER TREATMENT category are available/ serviceable.
		7. Equipment for supporting assigned tasks is enough to perform ALL assigned tasks without limitation. (Comment: Written comments according to evaluator assessment are required.)
F4.1.5	Unit Equipment for Accommodation and Storage is available and serviceable.	1. The last COE verification inspection has identified that 90% or more of ACCOMMODATION category/ ablution facilities are available and serviceable.
		2. The last COE verification inspection has identified the Self Sustainment category of ACCOMMODATION is available and serviceable.
		3. The last COE verification inspection has identified that 90% or more of the STORAGE category are available/ serviceable.

		4. The last COE verification inspection has identified that 90% (or more) of the TENTAGE category are available and serviceable.
		5. The last COE verification inspection has identified the Self Sustainment category of ELECTRICAL category are available and serviceable.
		6. Accommodation and Storage equipment are enough to perform ALL assigned tasks without limitation. (Comment: Written comments according to evaluator assessment are required.)
F4.1.6	The unit has the necessary equipment available and serviceable to provide effective camp support.	1. The last COE verification inspection has identified the Self Sustainment category of CATERING is available and serviceable.
		2. The last COE verification inspection has identified the Self Sustainment category of BEDDING category are available and serviceable.
		3. The last COE verification inspection has identified the Self Sustainment category of OFFICE category are available and serviceable.
		4. Camp Support equipment is enough to perform ALL assigned tasks without limitation. (Comment: Written comments according to evaluator assessment are required.)
		5. The last COE verification inspection has identified the Self Sustainment category of LAUNDRY are available and serviceable.
		6. The last COE verification inspection has identified the Self Sustainment category of CLEANING are available and serviceable.
		7. The last COE verification inspection has identified the Self Sustainment category of FURNITURE are available and serviceable.
		8. The last COE verification inspection has identified the Self Sustainment category of DEFENCE STORES are available and serviceable.
		9. The last COE verification inspection has identified the Self Sustainment category of BASIC FIRE FIGHTING category are available and serviceable.
		10. The last COE verification inspection has identified the Self Sustainment category of FIRE FIGHTING – FIRE DETECTION AND ALARM category are available and serviceable.
		11. The last COE verification inspection has identified the Self Sustainment category of WELFARE category are available and serviceable.
		12. The last COE verification inspection has identified the Self Sustainment category of INTERNET ACCESS category are available and serviceable.

F4.2 - Logistic Support to Operations		
F4.2.1	The unit has developed a logistic plan and outlines the logistic support requirements in the order.	1. The logistic support plan of the company is aligned with the Mission support plan (key requirements of UN and national responsibility are considered in the own plan).
		2. Tasks and responsibilities for the provision of logistic support elements are identified and outlined in the order. (Comment: Logistic Support, Environmental Protection and Medical.)
		3. The requirement to maintain adequate stock levels is outlined in this order. (Comment: POL, water, rations, ammunition, Recovery & Maintenance, Material and Equipment, Transportation, Medical Support.)
		4. The logistic component maintains an overview of storage levels of the entire unit (esp. if temporarily deployed) and identifies logistic support requirements.
		5. Supply points and routes are outlined in the order.
		6. Logistic report requirements are outlined in the order.
F4.2.2	Logistic situation awareness is properly established, updated, and maintained.	1. A logistic situational report system is established.
		2. All logistical situational reports from subordinated units are collected and analyzed to create logistic situational awareness (common logistic picture) of the Company.
		3. The support component regularly updates the unit commander on the logistic situation of the unit.
		4. The support component provides recommendations on improvement of the logistic situation to the unit commander.
F4.2.3	The unit maintains the operational readiness of its Engineering equipment.	1. The unit conducts pre-operational equipment inspections; function tests and takes corrective measures with all its Engineering (Combat and Construction) equipment. (Comment: Check the logbooks for pre-operational inspection.)
		2. The unit conducts post-task equipment maintenance of the special equipment after completion of each task. (Comment:) (Comment: Check the logbooks for post-task inspection.)
		3. The unit conducts post-task consumable replenishment after the completion of each task.
		4. The unit's special equipment is always ready to be deployed on short notice.
F4.3 - Sustainment		
F4.3.1	Food and water are properly stored and maintained.	1. The Company orders the supply of fresh, frozen, chilled, and dry rations based on the mission-specific cycle (e.g.: 30/60 days) and provides them to subordinate units.
		2. Storage for deep freeze (when required), cold (7days) and dry food is available at each contingent location and food storage facilities include appropriate temperature monitoring and control devices.

		3. The rations are stored in date order to allow for stock rotation.
		4. Food items are separated and segregated appropriately in the store.
		5. The unit keeps temperature logs, and they are up to date.
		6. Separate static water storage for drinking and bulk water is provided for a minimum of three days water per person.
		7. Each person of the Engineer unit receives a minimum of 4.5 l of drinking water per day and has access to treated bulk water for cleaning, shower, ablutions, and other uses (80 l/ 3 days).)
F4.3.2	The Catering procedures are maintained properly.	1. Stock book is kept, and contents are accurate.
		2. Catering Officer understands the rations demands process and the Ceiling Man-day Rate (CMR) allocation of rations.
		3. The Unit conducts Composite Ration Packs (CRP) and Bottled water stock checks regularly.
		4. The Unit reports stocks replenishment requirements in a timely manner.
F4.3.3	Weapons & ammunition are well maintained and stored in the proper way.	1. The last COE verification inspection has identified that Ammunition is stored in accordance with UN standards.
		2. Condition and shelf-life of ammunition are in accordance with UN standards.
		3. A registry for all ammunition in the national language with copies available in the mission language is maintained. (Comment: The registry must contain the following categories: Associated ammunition category, Type, Caliber, LOT and batch number, Number of each type, Location, Purpose of Issuing Ammunition, Date, and time of Issue.)
		4. Monthly reports on the status of their weapons, weapons-related equipment, and ammunition IAW the SOP Loss of weapons & ammunition para 19 are issued to the HOMC.
		5. Any Loss of weapons and ammunition are reported immediately through the chain of command in accordance with mission-specific guidance.
		6. The unit maintains a registry for each weapon and weapon-related equipment in the national language with copies available in the mission language. (Comment: The registry must contain the following categories for each weapon of the Battalion: type; make; caliber; serial number; total number of each type; weapon location; username; reason for issuing; date and time when issued.)

F4.3.4	The Eng unit maintains its facilities clean and healthy.	1. Waste disposal bins are placed at appropriate places and adequate in number.
		2. The Unit has the required Manuals and Guidelines on Hygiene.
		3. All facilities have hygienic equipment to keep a clean and healthy environment.
		4. No open drains in the operating base.
		5. Accommodation, ablution, laundry facilities, kitchen& dining hall are clean.
		6. The Unit has an assigned hygiene officer who conducts regular hygiene inspections of all facilities (Kitchen, dining hall, office spaces, accommodation, food storage, laundry, ablution) of the Eng Unit and sub-ordinate units. (Comment: Evaluation based on provided records of the inspections by the unit.)
F4.3.5	Firefighting measures are well prepared and put in place.	1. All areas (accommodations, stores, workshops, offices, kitchens etc.) meet with and are used in accordance with required Fire Safety Management regulations and policies.
		2. All personnel received the appropriate Fire Safety, Prevention, and Fighting Training and have all Fire related Exercises and Drills (Firefighting and evacuation) been conducted and recorded.
		3. All Fire safety and fighting related equipment, posters/signs, and Personnel Protection Equipment (PPE) in place with evidence of regular checks, tests, and maintenance along with related reports and records.
		4. All Fire Safety and Prevention measures related to different types of fires in place and recorded.
		5. There are valid Fire Safety related documentations (Fire Safety, Prevention and Fighting SOP of the unit) including Fire Safety Plan, Fire Emergency Evacuation Plan, and Immediate Fire Emergency Response Plan.
		6. Fire Risk Assessments and Fire Safety Inspections for all buildings /locations/ Ops are conducted and documented?
F4.3.6	POL is properly stored and maintained.	1. POL storage is provided as per Mission standards and containment basins with enough capacity are placed under all fuel tanks and fuel collection points.
		2. Eng Unit maintains records of (daily/weekly/monthly) generator fuel use (in L), ideally via the use of meters, as requested as Mission Support.
		3. The Engineer Unit has sufficient stock levels of spare parts and lubricants for Contingent Owned Equipment and a national support plan is in place to obtain these parts from their nation when required. (Comment: Check if un-serviceable equipment could be linked to lack of spare parts.)

		4. POL storage and internal distribution within sub-units are defined to comply with UN regulations for environmental protection. (Comment: Containment basins must be placed under all fuel tanks, generators, and fuel collection points)
F4.4 - Medical support		
F4.4.1	The unit has the required levels of equipment and supplies to ensure medical support.	1. The last COE verification inspection has identified that 90% or more of the MEDICAL HOSPITAL (level 1) category are available and serviceable.
		2. 60 days of medical supplies and consumables are available. (Comment: Needs to be checked by medical professional of the Sector/ Force)
		3. Proper stores for consumables and for medical equipment are available. (Comment: Is there an AC unit and registration for the temperature of drug store?)
		4. Medical equipment for assigned tasks is enough to perform ALL assigned tasks without limitation. (Comment: Written comments according to evaluator assessment are required.)
		5. The last COE verification inspection has identified that 90% or more of the MEDICAL AMBULANCE category are available and serviceable.
		6. The last COE verification inspection has identified that 90% or more of the MEDICAL EQUIPMENT category are available and serviceable.
		7. The last COE verification inspection has identified the Self Sustainment category of MEDICAL LEVEL 1 category are available and serviceable.
		8. The last COE verification inspection has identified the Self Sustainment category of COMMUNAL FIRST AID category is available and serviceable.
		9. The last COE verification inspection has identified the Self Sustainment category of BUDDY FIRST AID (BFA) category are available and serviceable.
		10. The last COE verification inspection has identified the Self Sustainment category of HIGH-RISK AREAS (EPIDEMIOLOGICAL) category are available and serviceable.
		11. 100% of unit personnel deployed with a first aid kit. (Comment: Conduct spot checks)
		12. 100% of tourniquets available in all first aid kits. (Comment: Conduct spot checks)

F4.4.2	Level 1 of the unit can provide standard medical services at a static location.	1. Level 1 has a treatment capacity of 20 ambulatory patients per day and a holding capacity of 5 patients for up to 2 days.
		2. Level 1 has two medical officers and six paramedics/ nurses.
		3. Level 1 maintains records of treated personnel and provides referrals (recorded) for treatment of personnel at Level 2/3.
		4. Level 1 personnel can name the determined higher-level treatment facilities identified for the Battalion by the Force Medical Officer.
		5. Level 1 conducts routine sick calls and the manages minor sicknesses and injuries among personnel for immediate return to duty.
		6. Level 1 provides advice to the contingent personnel on disease prevention.
		7. Level 1 provides medical risk assessments and contributes to determining force protection measures within the area of operation (AOR) of the Company.
		8. Level 1 has a designated isolation possibility for infectious patients. (Comment: Isolation facilities can be in the level 1 or in the camp.)
F4.4.3	Level 1 provides regular Buddy First Aid refresher training to unit personnel.	1. Training is provided at least every 3 months to all unit personnel and is documented (incl. participants). (Comment: Training should be conducted during pre-deployment training and be recorded.)
		2. Training includes application of Tourniquets for Extremity Hemorrhage.
		3. Training includes Wound Packing for Limb Injuries not Amenable to Tourniquet Application including Application of Emergency Pressure Bandages.
		4. Training includes Airway Management procedures and techniques.
		5. Training includes areas like Fracture Immobilization, Burns, Bites, and stings.
		6. Casualty Movement Techniques, CASEVAC procedures and request are included in the training.
		7. Training on healthcare policies and procedures is included.
F4.4.4	Level 1 is organized, trained, and equipped to provide emergency medical services for the unit.	1. Level 1 is able to split into two forward medical teams (1 medical officer and 3 paramedics/nurses in each).
		2. Level 1 emergency resuscitation equipment and drugs are prepared, portable, and transportable by helicopter.
		3. Level 1 equipment includes Fluids, Splints and bandages, Surgical sets for minor surgical procedures, Field dispensary, Stretchers
		4. Level 1 provides (is equipped and trained for) casualty collection from the point of injury/wounding.

		5. Level 1 provides limited triage and stabilization of casualties.
		6. Level 1 prepares casualties for evacuation to the next level of medical capability or the appropriate level of medical facility depending on the type and gravity of the injuries.
F4.5 - Environmental Management		
F4.5.1	The military unit has implemented effective environmental measures related to Water and Wastewater management in the Permanent Operating Base.	1. The unit maintains records of (daily/weekly/monthly) water consumption (in L), ideally via the use of meters. (Comment: Please also note if water meters are in place or not.)
		2. The unit maintains records of data on (daily/weekly/monthly) water abstraction (in L), if applicable (e.g., boreholes), ideally via the use of meters. (Comment: Please add the frequency of records in the Comment field e.g., quarterly.)
		3. The unit reports data on water consumption and/or abstraction (in L) to Mission Support, as per the requested frequency.
		4. The unit demonstrates the implementation of water conservation measures (harvest water, use treated wastewater…), as per Mission Support Directive. (Comment: List examples of best practices implemented by the unit.)
		5. The unit has a designated environmental focal point who conducts regular site inspections and ensures the implementation of environmental measures.
		6. The unit coordinates with the mission's environmental unit to align its water and wastewater management practices with the overall mission's environmental policy and guidelines.
F4.5.2	The military unit has implemented effective environmental measures related to solid and hazardous waste management in the Permanent Operating Base.	1. The unit has a waste management plan that aligns with the mission's waste management policy and guidelines.
		2. The unit provides training to its personnel on proper waste segregation, handling, and disposal procedures.
		3. The unit maintains records (daily/weekly/monthly) of the amount of general waste produced (in Kg), as requested by Mission Support.
		4. The unit reports data on the generation of general solid waste (in kg) to Mission Support, as per the requested frequency.
		5. The unit demonstrates proper segregation of general waste in color-coded bins (e.g., composting, paper, plastic, metals, etc.).
		6. The unit demonstrates proper hazardous waste management practices (e.g.: hazardous waste inventory, proper handling, and storage in place), as per Mission Support Directive.
		7. The unit demonstrates proper management of medical waste at Level 1 hospitals (incl. medical waste segregation

		and incineration process inappropriate medical incinerator), as per the Mission Support Directive.
		8. The unit demonstrates efforts to act on waste management of non-functional COE and expired materials by actively communicating with the concerned Mission units (COE, PDU, Environment, FMU, etc.) and/or showing plans for the repatriation of non -functional COE.
F4.5.3	The military unit has implemented effective environmental measures related to energy management in the Permanent Operating Base.	1. The unit has an energy management plan that focuses on reducing energy consumption and increasing energy efficiency.
		2. The unit maintains records of (daily/weekly/monthly) electricity demand (in Kwh), ideally with the use of meters, as requested by Mission Support.
		3. The unit maintains records of (daily/weekly/monthly) generator fuel use (in L), ideally via the use of meters, as requested as Mission Support.
		4. The unit reports data on electricity demand (in Kwh) and generator fuel use (in L) to Mission Support, as per the requested frequency.
		5. The unit demonstrates containment basins with berms are positioned under fuel storage, generator sets, and used POL storage to prevent soil contamination, oil separators are provided to the basins and to concrete floors beneath the generators.
		6. Emergency containment measures are immediately undertaken, using spill kits as appropriate, to reduce as much as practicable discharges to the environment, and any such incidents are immediately reported to Mission Support/Environment Unit.
		7. The unit demonstrates best practices to reduce fuel and electricity consumption, and realize energy efficiencies (e.g.: generator synchronization, reduced vehicle idling, turning off ACs, Replacement of conventional bulbs with LED). (Comment: List the examples of actions.)
		8. The unit coordinates with the mission's environmental unit to align its energy management practices with the overall mission's energy and emissions reduction targets
F4.5.4	The military unit has implemented effective environmental measures related to overall environmental management in the Permanent Operating Base.	1. The unit has an environmental management plan that addresses the integration of environmental considerations into its operations and engineering projects.
		2. A focal point is appointed and conducts site inspections regularly.
		3. The unit provides environmental awareness training to its personnel on topics such as environmental compliance, impact mitigation, and sustainable practices.
		4. The unit implements the recommendations from the environmental inspection report in due time.
		5. The unit complies with the basic duties of peacekeepers towards environmental protection measures:

		I. Bring empty (plastic) water bottles used during patrols back to camps for proper disposal (Do not throw away bottles/wraps directly into nature). II. Avoid bringing to the area of operations plastic cutlery as well as using it. III. Undertake energy conservation measures: switch off all appliances, lights, and air conditioning when not in use. IV. Avoid vehicle idle time as much as possible. V. Undertake water conservation measures, especially in water-scarce areas. VI. Do not bring any plant/seeds from the country of origin, which is not endemic to the country of deployment, and vice versa. VII. Do not acquire wild plants and animals, alive or dead. Avoid using charcoal.
		6. The unit demonstrates the use of the STOP tool (Stop, Think, Observe, Plan) when undertaking a new task to assess and mitigate risks to the environment. (Comment: Explanation: *Stop before you start a new task/operation. Think, does the task involve issues (e.g., fuels, water, waste) that could affect the environment? Observe the environment around you (e.g., drains, streams, trees). Plan, the task to avoid any damage to the environment.)
		7. In case of a site closure, the unit undertakes the necessary clean-up activities, with Mission Support advice, to leave the premises and physical environment in the conditions it was provided to them. (Comment: If this score cannot be evaluated as non-applicable.)
		8. The unit conducts regular environmental awareness briefings (every 3 months).
UN Military Engineer Unit Function 4: SUSTAINMENT (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Function 5: Communications

Description: Engineer Unit's Headquarters Support Platoon operates under the Logistics Staff Section, and it includes a Signal Section. The signal section provides suitable equipment for internal communication, telephone communication from the UN mission to the respective countries and access to Email, Internet for personal, office or welfare purposes is available in the Engineer Unit.

UN Military Engineer Unit Function 6: COMMUNICATIONS		
Number	Standards	Indicators
F5.1 - Planning & Communications architecture		
F5.1.1	The unit has established a communications architecture including enabling infrastructure for internal communications with subordinate and supporting units.	1. The Communications component is trained and organized to support the communication infrastructure besides being proficient in basic military tasks. Ref.: Subjective assessment of evaluators.
		2. The communication architecture is aligned with tactical deployment and is designed to cater for all operational tasks and contingencies. (Comment: This means that for all possible operational scenarios, the communication plan ensures effective communication with primary, alternate, contingency, and emergency networks clearly defined.)
		3. The communications architecture is coordinated with higher HQs and describes the integration of the unit's communication equipment with higher, lower and support elements as well as other Mission components.
		4. The communication architecture supports command and control of the entire unit, situational awareness, secure communications with Higher HQs, and coordination with neighboring units and internally.
		5. The internal communication system incorporates telephonic and data communication between static elements.
		6. Radio communications is used for Command & Control of mobile operations based on identified Primary, Alternate, Contingency, and Emergency Networks.
		7. The communications architecture ensures availability of enabling infrastructure such as repair facilities and battery charging devices.
F5.1.2	The communication plan for the conduct of an operation/ task is incorporated in the order of the Engineer Unit. (Comment: Check Company Orders.)	1. Signal Instructions are issued clearly to include details of code words, radio net diagrams and frequency management issues during operations and static duties.
		2. All command relationships of units conducting the operation are defined in the order.
		3. Available communications networks to conduct the operation are defined.
		4. Primary, alternative (including SATCOM), command and emergency mean of communication during each phase of an operation and for static duties are defined in the order.

		5. Mitigation measures for communication disruptions are outlined in the order.
		6. The communication plan describes all available existing communication means.
		7. Frequencies & Call signs have been established for radio communications of all units.
F5.1.3	Signal component supports planning and conduct of all unit operations. (Comment: Can only be evaluated if a planning process is conducted during the evaluation.)	1. The Signal component monitors radio traffic during the operations and maintains log to that effect using existing radio sets.
		2. The Signal component develops communications' estimate of the own unit that includes details of equipment (spares and reserves) that are available.
		3. The Signal component evaluates the supportability and feasibility of the signal plan for each proposed course of action.
		4. The Signal component develops a signal support plan for the approved operations plan.
		5. The Signal component consults with higher, lower, and support elements and other mission components to ensure effective communications during operations.
		6. The Signal component manages tactical radio and telephone networks.
F5.2 - Support to Operations		
F5.2.1	The Engineer unit has established an effective telephone communications network.	1. The unit operates telephonic communications to all other static locations of the unit. It includes unit's HQs, stationary elements (such as offices, workspaces, observation posts and guard posts) and sub-units located at the main base camp.
		2. The unit operates and maintains a switchboard.
		3. All telephone lines of the unit are operational 24/7.
F5.2.2	The Engineer unit has established and maintains effective radio communications networks.	1. The unit operates & maintains a VHF/UHF command and control net, down to the sub-unit (section/ squad) level.
		2. The unit operates & maintains one VHF/UHF/HF administrative net.
		3. During tactical and mobile operations, the unit commander can communicate with sub-units and sub elements which are unable to communicate via telephone and beyond the range of VHF/UHF- FM base station communications.
		4. Radio operators can site, establish and operate radio repeater detachments based on vehicles and man-pack.
		5. Unit provides a command-and-control net using non-vehicular mounted HF communications equipment.
		6. Communication channels are always operational (24/7) within the unit.

		7. Rear linked communications between the contingent and the home country is established and includes telephonic communications.
F5.2.3	The personnel of the Engineer unit conduct effective radio communications.	1. Radio communication procedures are outlined in a unit SOP and aligned with UN procedures. (Comment: The SOP includes guidelines for transmitting phonetic alphabet and numbering and procedure words.)
		2. Radio communications with higher HQs is conducted in English based on UN procedures.
		3. Messages transmitted over radio use defined procedure words.
		4. Radio operators transmit messages that are clear and brief.
		5. Radio checks are conducted before conducting each task with all stations involved in the task.
		6. Orders to conduct tasks (verbal or written) include always Primary, alternative, command, and emergency frequencies (including SATCOM).
		7. Officers and radio operators can use basic radio equipment in service in their unit and operate it according to the internationally recognized procedure.
UN Military Engineer Unit Function 6: COMMUNICATIONS (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Function 6: Training

Description: Training for military units is broadly separated in the United Nations into Pre-Deployment Training (PDT) and In-Mission Training. During PDT TCCs must train their personnel to operate as a UN Engineer Unit in the specific UN operating environment to which they will deploy and to UN standards. This means that TCCs must re-orientate the operational capabilities of a company, within the parameters set by the UN, so that it can operate in a peacekeeping environment. The focus of In-Mission Training is on Mission - specific induction training and the maintenance of capabilities and skills. The current function is focused on the training to be conducted during the deployment to a UN PKO.

UN Military Engineer Unit Function 7: TRAINING		
Number	Standards	Indicators
F6.1 - Training plans and documents		
F6.1.1	The unit has facilities, resources, and training related documents to conduct regular training and rehearsals in the mission area.	1. The unit has the infrastructure to facilitate contingent training (classrooms and appropriate IT infrastructure).
		2. The unit maintains a current record of all training policies, SOPs, guidelines applicable to the contingent, including UN Training Policy and Guidelines, FC's Training Directive, FHQ/SHQ training documents, and instructions.
		3. The unit has a written training program in line with guidance/FC Training Directives.
		4. The unit is aware of UN websites/resource hub for PKO training manuals and can access to the same and developed a training plan based on referenced documents.
		5. Resources are planned and assigned to the unit to conduct training and rehearsals and there is a reporting mechanism in place and used.
F6.1.2	The unit has developed training plans to improve on identified performance shortfalls.	1. The UN unit is keeping records of After-Action Reviews, in-mission evaluations, Performance Improvement Plans, and Instructions from SHQ/FHQ.
		2. Training plans are aligned with Mission specific guidance (SOPs, FC's Training directive and FHQ/SHQ instructions).
		3. Previous observations/ recommendations of Pre-deployment visits and in-mission evaluations are incorporated into training plans to improve on identified shortfalls. (Comment: Note that for units that have received a Pre-Deployment Visit before their deployment/ rotation the contingent commander should also have knowledge on provided improvement recommendations (not mandatory).)
		4. Training plans consider training recommendations of the unit's performance improvement plan.
		5. Training plans are based also on input from all staff functions of the company to synchronize training with operational activities.

		6. Training plans have been coordinated with Force/ Sector HQ to ensure that temporary capability reduction during scheduled training does not degrade mission performance and have been approved by the Sector HQ.
F6.2 - Conduct, Monitoring and Reporting of training activities.		
F6.2.1	The unit has effectively conducted Awareness Training.	1. A plan has been developed to ensure that 100% of unit members completed the induction in the form of awareness generation. (Comment: Awareness generation sessions are to be held periodically as refreshers or to emphasize some issues of importance to missions.)
		2. Attendance of unit personnel at mission-specific induction training has been recorded by name and 90% of unit personnel have attended mission-specific induction in the form of awareness generation. (Comment: Awareness generation sessions are to be held periodically as refreshers or to emphasize some issues of importance to missions.)
		3. There is a training plan in place to meet documented induction training shortfalls.
		4. A plan has been developed to periodically train and inform the personnel on the changing threat scenarios.
F6.2.2	The unit conducts regular refresher for all unit members.	1. 90% of unit personnel have received refresher training (and passed the associated test of objectives) at least once per 6 months. (Comment: Needs to be documented. Check training plan and training logbook.)
		2. 1 or 2 Buddy First Aid, CASEVAC, and Heli Evacuation procedures courses every six months.
		3. At least 1 weapon handling training for individual and crew-served weapons (including calibration) and firing practice every six months. (Comment: The unit must have requested a live firing range if no range is available.)
		4. One ROE training every three months focusing on the correct practical application of ROEs in mission-specific scenarios and ROE reporting requirements.
		5. One session per deployment on the UN Code of Conduct and SEA prevention training.
		6. Two training courses every six months on radio communications, voice procedures (including communication with helicopters), and navigation.

F6.2.3	The unit personnel have received mandatory conduct and discipline and SEA prevention training (pre-deployment and in-mission).	1. A unit SOP (or recorded order) describes that the unit must conduct in-mission training on UN standards of conduct, including zero-tolerance policy on sexual exploitation and abuse (SEA), (which may occur in coordination with the Conduct and Discipline Team).
		2. Written records show that the unit conducted UN standards of conduct, including a zero-tolerance policy on sexual exploitation and abuse (SEA) prior to deployment.
		3. A record is maintained to confirm that all unit members (100%) have received conduct and discipline induction training since arrival in the mission. (Comment: For all unit members that have not yet completed the training, a record of an ongoing schedule to achieve compliance needs to be presented.)
		4. There is a record that 100% of unit personnel have taken the mandatory SEA Training Program via E-learning or in a classroom setting. (Comment: For all unit members that have not yet completed the SEA E-Learning Program, a record of an ongoing schedule to achieve compliance needs to be presented)
		5. Gender responsive sensitive topics are delivered by a combination of male and female instructors.
		6. Conflict related sexual violence and human rights training activities are conducted.
		7. Participation of every soldier is recorded.
UN Military Engineer Unit Function 6: TRAINING (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Task 1: Obstacle Crossing

Description: The unit is tasked to construct standard / improvised crossing over obstacles using expedients in each time. It is basically to evaluate if the unit is capable of constructing a crossing using the available resources like the earth moving equipment. Bailey bridge construction may be evaluated only if the unit has the bailey bridge capability. In this case, the unit is considered for establishing an entry and exit approach for men and vehicles across a water obstacle.

UN Military Engineer Unit Task 1: Obstacle Crossing (Combat Engineering Task)		
Number	Standards	Indicators
T1.1 - Planning and Preparation		
T1.1.1	Commander performs engineer appreciation for the task.	1. Conduct of quick assessment on the obstacle: (kind of obstacle, location, access the terrain, soil, time limit for crossing obstacle etc.)
		2. Assess the time and resources required for the task.
		3. Analyze the own capability to execute the task
		4. Request additional support (DMS, Force Engineer etc.)
		5. Assess the mobilization and deployment requirements.
		6. Tactical movement plan to the obstacle.
		7. Asses the crossing for temporary or permanent. (standard or improvised)
T1.1.2	Obstacle crossing task plan is prepared.	1. An obstacle crossing plan is prepared (with a sketch, map, all calculations of the required equipment etc.).
		2. Ensures the planning is in line with task order issued by higher HQ.
		3. Planning is clearly outlined the specific period for the various stages of the crossing.
		4. Planning of the specific requirements, support arrangement, and liaison instruction is included.
		5. Logistic supply plan (supply of construction materials, fuel, spare parts for the equipment, also include food and water supply for the troops).
		6. Security plan and MEDEVAC/CASEVAC plan.
		7. Planning of procurement of the necessary materials by the unit if applicable.
T1.1.3	Grouping (assign sub-units to fulfill the task) is organized based on the envisaged task.	1. All types of safety instructions must be issued to every individual, and they are ensured during the entire execution of the task.
		2. Grouping of the sub-units with their appropriate equipment (site preparation, site survey, earthwork, bridge construction etc.)
		3. Mobilization – able to mobilize heavy equipment to the site.

		4. Store management and proper procurement process if applicable and required.
		5. Assign/coordinate the Force Protection party.
		6. Logistics support and support arrangement coordination.
		7. Commanders of the sub-units conduct spot checks for all the equipment before conducting task execution.
T1.1.4	The unit commander issues the order for the construction of obstacle crossing.	1. Order describes a clear and concise statement of what the unit must accomplish.
		2. The order describes the specific activity with a specific timeframe to be accomplished by each sub-unit.
		3. The order includes the requirement of resources (store & workforce with locations) including transport requirement.
		4. Support arrangements are coordinated with higher HQs.
		5. The order describes Command and control measures including reporting instructions and communication methods.
		6. Logistical concerns/resupply of the materials and other supply considerations are instructed.
T1.2 - Conduct of Task		
T1.2.1	The commander exercises effective command and control.	1. Commanders react quickly to situation developments and report the progress to a higher HQ.
		2. Safety procedures must be ensured at all times.
		3. Proper procedures of the procurement must be followed as instructed.
		4. Commander ensures all coordination for specific requirements, support arrangements for execution of the task.
		5. Force protection is maintained at all times during the execution of the task.
T1.2.2	Obstacle crossing operation is conducted as planned.	1. A topographic survey for ground leveling at the crossing site is carried out and GPS is used to mark maps and layout sketches.
		2. A site survey is conducted, and the survey team estimated earthwork requirements for obstacle crossing.
		3. Ensure the proper earthmoving task execution including earth moving plants, entry and exit approaches with appropriate equipment (bulldozer, loaders, excavators etc.).
		4. Construction of the crossing (bridging, or river crossing etc.) is executed timely.
		5. The Unit is sufficiently self-sustained to undertake tasks and has the ability to construct crossings using appropriate stores and expedients.
T1.2.3	The obstacle crossing is accomplished effectively.	1. The obstacle crossing task is completed as planned.
		2. Force protection measures provided / to be ensured while on move and execution of tasks.
		3. Spot check on all equipment is conducted and proper reporting must be ensured.

		4. Movements are conducted through obstacle crossings safely.
		5. Proper handover to the authorities is conducted.
UN Military Engineer Unit Task 1: Obstacle Crossing (Combat Engineering Task) (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Task 2: Conduct Search Operations in support of Freedom of Movement and EOD

Description: To confirm the presence or absence of specified targets in the support of the full spectrum of operations, but especially in support of FOM and EOD, search teams (All-Arms-Search-Teams / AAST and Specialized Search Teams (SST) plan, manage and apply systematic procedures and appropriate techniques, Specified targets may include people, vehicles, routes, areas, locations, buildings, and material resources employed by a perpetrator or to be used by friendly forces or concealed threats such as conventional weapon systems, items of Explosive Remnants of War (ERW) and IEDs and components thereof. This task is generally performed to assist any mobility unit, especially infantry battalions, combat transport or logistic units. Search teams are usually employed to ensure freedom of movement as well as clearance of routes, on vulnerable points (VP) and vulnerable areas (VA) as well as within buildings and other infrastructure.

UN Military Engineer Unit Task 2: Conduct Search Operations in Support of Freedom of Movement and Explosive Ordnance Disposal		
Number	Standards	Indicators
T 2.1 - Planning and Preparation		
T 2.1.1	The unit commander conducts a thorough assessment of the operational environment, including threat analysis, terrain, and potential vulnerable points/areas.	1. The commander obtains all available information related to the known or suspected threats, including potential hotspots and adversary TTPs.
		2. The commander plans and prepares the execution of the task, considering the appropriate search capabilities, systematic procedures, and minimizing disruption and damage
		3. The commander calculates time and resource requirements, including the potential use of (temporary composite) Route Clearance Packages (TCRCP/RCP).
		4. The unit commander develops a comprehensive search plan, detailing the required search capabilities (AAST, SST), resources, coordination, and execution.
		5. The commander coordinates with other agencies and works closely with the Search Advisor.
		7. The commander verifies the required supporting elements (EOD, IEDD, EDD, CREW, ISR, MP, FP, etc.).
T 2.1.2	The unit commander issues clear orders outlining the task, roles and responsibilities, and reporting procedures.	1. The order describes a clear and concise statement of what the unit must accomplish.
		2. The order includes terrain and route analysis, identified potential VPs and VAs, and specific search activities to be conducted.
		3. Requirement of resources (store & workforce with locations) including transport requirement.
		4. The order outlines the command, control, and communications plan, logistics plan/resupply, security, and MEDEVAC arrangements.
		5. All drills and TTPs are rehearsed by the unit/subunit.

T2.2 - Execution of Search Operations		
2.2.1	Establishment of a Secure the Incident Control Point (ICP)	1. The search team commander identifies and establishes the ICP in a previously secured and searched location.
		2. The search team clearly delineates hazardous, cleared, and usable areas within the worksite.
		3. Control the movement of search worksite staff and visitors (including members of the public) at the worksite.
		4. Safety measures are being applied and all findings are documented accordingly.
2.2.2	The search team executes the search operations in a coordinated and controlled manner, adhering to relevant TTPs and SOPs.	1. The search team commander issues confirmatory orders and executes the search task using a four-stage framework (Secure ICP, isolate and dominate; execute the search; and secure and hand over).
		2. The target area must be isolated from outside influences by dominating the surrounding terrain.
		3. Search members of the team should be directed to a segregated area, be searched away from others and from outside interference and nobody gets in or out when the search takes place.
		4. The search team hands it over to the EOD team commander upon completion of the search task.
		5. Search Team fills out a comprehensive Search Report with correct Grids, Areas, Search Methods, Sketches, and Findings.
T2.3 Reporting and Administrative Requirements		
T 2.3.1	The search team completes all necessary post-task administrative requirements, including reporting and documentation.	1. The search team fills out a comprehensive search report and transmits it to all concerned stakeholders and HQs.
		2. The search team commander conducts after-action reviews with the team members, identifying lessons learned and best practices.
		3. The findings of the after-action reviews are recorded and used to make necessary adjustments to tactics, techniques, and procedures.
		4. Best practices and lessons learned are shared with higher headquarters for distribution to other units.
UN Military Engineer Unit Task 2: Conduct Search Operations in Support of Freedom of Movement and Explosive Ordnance Disposal) (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Task 3: CASEVAC

Description: The unit must be prepared to provide immediate first aid and coordinate the evacuation of any casualties that may occur during the search operations or execution of any other mandated tasks. Effective CASEVAC procedures are crucial to ensure the timely and safe evacuation of injured personnel to the appropriate medical facilities. There may be cases when MILENG deploys without any organic medical capability. In such a scenario, preparedness and coordination with all stakeholders becomes Centrepoint to ensure speedy evacuation.

UN Military Engineer Unit Task 3: CONDUCT CASEVAC		
Number	Standards	Indicators
T 3.1 - Planning and Preparation		
T3.1.1	CASEVAC Procedures and Coordination	1. Unit has established an operational readiness system for CASEVAC, including alert procedures and 9-liner reporting.
		2. Unit can effectively coordinate CASEVAC requests with higher HQ/medical elements and secure the incident/accident area.
		3. Unit can demonstrate proper actions to achieve the "10-1-2" goal for casualty response.
		4. Commander obtains all relevant information (from EOD Cell, Search Advisor or Units C2 element) to the known or suspected threat including possible hotspots, danger area (DA), and adversary TTPs.
T3.1.2	Medical Support and Evacuation	1. Paramedics can effectively triage, stabilize, and prepare casualties for CASEVAC.
		2. Unit maintains medical equipment and supplies in a state of operational readiness
		3. Unit conducts regular first aid and CASEVAC training, including with mission medical assets
T3.2 - Execution of CASEVAC TASK		
T3.2.1	CASEVAC during Remote Area Operations	1. Unit has planned and can execute independent operations in remote areas, including self-sustaining medical support.
		2. Unit can effectively liaise and coordinate with local medical/civilian resources to supplement CASEVAC capabilities
		3. Unit maintains updated medical evacuation plans and has rehearsed contingency procedures
T3.2.2	Communications and Reporting	1. Unit can reliably communicate CASEVAC requests and casualty information up the chain of command.
		2. Unit submits timely and accurate medical/CASEVAC reports as per mission SOPs.
		3. Unit consolidates and shares CASEVAC-related findings with higher HQ.
T3.2.3	Training and Readiness for CASEVAC Task	1. All MILENG personnel can demonstrate the proper application of basic lifesaving first aid techniques.

		2. Unit conducts regular CASEVAC training, including with mission medical assets
		3. Unit maintains medical equipment and supplies in a state of operational readiness.
UN Military Engineer Unit Task 3: CONDUCT CASEVAC (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Task 4: Route Clerance Operations (Employment of RCP)

(Combat Engineer Task)

Description: A Route Clearance Package (RCP) is a dedicated, task-organized group designed to identify and neutralize IED threats along specified routes. Equipped with specialized vehicles and equipment, RCPs conduct thorough searches and enhance road surfaces to eliminate concealment of explosives. They provide vital support to ensure freedom of movement for both friendly forces and civilians, maintaining safety along critical supply routes during tactical operations.

UN Military Engineer Unit Task 3: Route Clearance Operations		
Number	Standards	Indicators
T 4.1 - Planning and Preparation for Route Clearance Package		
T4.1.1	Formation of a Route Clerance Package (RCP)	1. The unit commander conducts a detailed threat and route assessment to determine the required RCP composition and capabilities.
		2. The unit coordinates with higher headquarters to task-organize the RCP with the necessary elements (engineers, EOD, security, search teams, etc.) based on the threat and mission requirements.
		3. The RCP plan includes measures to eliminate concealment opportunities, conduct systematic detection, and provide deterrence along the route.
		4. The RCP plan incorporates the use of specialized detection, interrogation, and proofing equipment to identify and remove IED threats.
		5. The RCP plan includes the use of engineer construction equipment to improve the route and reduce IED emplacement opportunities.
		6. The RCP plan aligns with the overall mission's route management and freedom of movement requirements.
		7. The RCP plan includes contingency measures, safety protocols, and coordination with supporting elements (e.g., medical, quick reaction force).
T4.1.2	Organization and Employment of the Search Teams	1. The RCP plan defines the roles and responsibilities of the all-arms search team (AAST) and any specialist search teams (SST) (e.g., EOD search, canine search) based on the assessed threat.
		2. The AAST is trained and equipped to conduct systematic searches of the route, including visual, electronic, and manual techniques.
		3. The specialist search teams (SST) are integrated into the RCP to provide advanced detection and interrogation capabilities.

T4.2 - Execution of Route Clearance Operations		
T4.2.1	Deployment of RCP and conduct of route clearance operations	1. The RCP systematically searches the entire route, utilizing appropriate search techniques and capabilities.
		2. The RCP identifies, interrogates, and disposes of any explosive hazards along the route using its internal EOD assets.
		3. The RCP employs engineer construction equipment to eliminate concealment opportunities and improve the route as required.
		4. The RCP maintains close coordination with security elements to provide overwatch and secure vulnerable areas/points.
		5. The RCP ensures the route is cleared to the determined standard and provides the necessary reporting to higher headquarters.
		6. The RCP remains ready to be reconstituted and redeployed as required to maintain the cleared route or support other tactical movements.
T4.2.2	Search Operations for route clearance	1. The all-arms search team (AAST) systematically scans the route, employing visual, electronic, and manual search techniques to detect potential threats.
		2. The specialist search teams (SST) provide targeted support to the all-arms search team, utilizing their advanced capabilities to locate and identify explosive hazards.
		3. The search teams maintain close coordination and communication with the EOD and engineer elements to ensure a synchronized clearance effort.
		4. The search teams document their findings, collect any relevant evidence, and provide timely reporting to the RCP commander.
		5. The search teams adapt their techniques and procedures based on the evolving threat and terrain conditions along the route.
T.4.2.3	Transition and route maintenance post the execution of Route clearance operations.	1. The RCP coordinates with relevant mission components to ensure the continued maintenance and monitoring of the cleared route.
		2. The unit incorporates lessons learned from RCP operations into its planning and training to improve future route clearance efforts.
		3. The unit maintains a state of readiness to rapidly reconstitute the RCP when required to support freedom of movement operations.
		4. The unit incorporates lessons learned from the performance of the search teams into its planning and training to enhance future route clearance efforts.

UN Military Engineer Unit Task 4: Route Clearance Operations (Combat Engineer Task) (Overall Assessment):
Observation & Recommendations

MILENG Unit Task 5: Establishment of field defenses / Improvement of existing defenses

(Combat and Construction Engineering Task)

Description: The establishment of field defense of own base/camp is the responsibility of each military unit. Yet some field defense tasks like defense barriers, chain link fence, earth embankment, dug-in position/ shelter might be considered as a mission priority. Considering the resource limitations of other units those tasks can be given to Engineer units for implementation. The unit is tasked to prepare field defenses / improve existing field defenses for the hardening of key points/position in a given time.

UN Military Engineer Unit Task 4: Establishment of field defenses / Improvement of existing defenses. (Combat and Construction Engineering Task)		
Number	Standards	Indicators
T5.1 - Planning and Preparation		
T5.1.1	Unit Commander undertakes initial survey and engineer appreciation for the task.	1. Commanders and staff assess the Force protection plan and the field defense improvement plan (defense barriers, chain link (razor wire) fence, earth embankment, dug in position/ shelter) and coordinate with the base commander for the execution of the task.
		2. Estimates the requirements of expedients, earthwork, and earthmoving plant requirements.
		3. Calculates time and resources requirements (equipment and workforce).
		4. Ensures earmark trade proficient personnel for construction/maintenance.
		5. Calculate the mobilization and deployment requirements.
		6. Analyze their own capability to execute the task and request additional support if needed.
T5.1.2	Planning for the construction, or improvement of field defense task.	1. Plans for construction of field defense or improvement of the defense (with a sketch, map, model, etc.).
		2.The unit is organized based on the envisaged tasks and may include the following elements: Mobilization, Task execution to include earthwork tasks as required, Store management, Protection party (if required), and Logistics support.
		3. Ensures the planning is in line with task orders issued by higher HQ.
		4. Special instructions, including the security plan, coordination and support mechanism other units, contingency plan, and MED/CASEVAC plan are included.
		5. Logistic supply plan (supply of construction materials, fuel, spare parts for the equipment, also include food and water supply for the troops).
		6. Planning of procurement of the necessary materials by the unit if applicable.

T5.1.3	Unit commander issues the order for construction or improvement of field defense.	1. The order describes a clear and concise statement of what the unit must accomplish (details of expected tasks).
		2. The order describes the specific activity with a specific timeframe to be accomplished by each sub-unit and earmarking correct trade personnel for the task.
		3. The order clearly outlines the specific period for the various stages of the activity to be accomplished by each sub-unit and earmarking correct trade personnel for the task.
		4. Requirement of resources (store & workforce with locations) including transportation requirement.
		5. The order describes Command and control measures including reporting instructions and communication methods.
		6. Special instructions, including the security plan, coordination, and support mechanism other units, and MED/CASEVAC plan are included.
		7. Force protection measures provided / to be adopted while on move and execution of tasks.
		8. Logistical concerns/resupply of the materials and other supply considerations are instructed.
T5.2 - Conduct of Task		
T5.2.1	Unit is sufficiently self-sustained and executes the task as planned.	1. The unit has topographic survey equipment and trained personnel. Survey personnel/party of the unit is setting outfield defence work. A survey of ground levels is carried out and GPS is used to mark maps and layout sketches.
		2. The unit has proficient trade personnel for construction works including masonry, woodwork, metal works, etc.
		3. The unit can level the ground, fill up the defence barriers, create earthwork for embankment or dug in position/ shelter by using earth moving plants to include excavator loaders, dumpers, bulldozers etc. (use of available equipment)
		4. Construction of field defenses and necessary protection of structures like drainage, revetment, overhead cover/ protection etc. is prepared.
		5. Safety procedures must be ensured at all times.
		6. Force protection is maintained at all times during the execution of the task.
		7. The Unit Commander exercises appropriate C2 during move and execution of the task (e.g., undertake resource management and caters for contingencies)
		8. The Unit Commander reports the progress of the task to the higher HQ.
UN Military Engineer Unit Task 5: Establishment of field defenses / Improvement of existing defenses. (Combat and Construction Engineering Task) **(Overall Assessment):**		
Observation & Recommendations		

MILENG Unit Task 6: Construction or Repair of Helipads

(Combat and Construction Engineering Task)

Description: UN Engineers mobilization task includes construction and repair of Helipad which for some remote deployments constitute the main supply route and only viable option for medical evacuation. Based on mission priority, Helipad construction, and repair tasks will be implemented by Construction/ Combat Engineer companies. Construction or repair of Helipad is a time-sensitive task.

UN Military Engineer Unit Task 6: Construction or repair of helipads. (Combat and Construction Engineering Task)		
Number	Standards	Indicators
T6.1 - Planning and Preparation		
T6.1.1	Unit Commander undertakes an initial survey of the task.	1. Commander performs engineer appreciation for the task.
		2. Calculates the time and resources required.
		3. Estimates the requirements of expedients, earth work, and earth moving plant requirements.
		4. Calculates store requirements for helipad marking.
		5. Calculates the mobilization and deployment requirements.
T6.1.2	Planning for the construction or repair of helipads.	1. Plan for construction or repair of the helipad is prepared (with sketch, map, all calculations of the required equipment, etc.).
		2. Ensures the planning is in line with task orders issued by higher HQ.
		3. Planning is clearly outlined the specific period for the various stages of the construction or repair of the helipad.
		4. The unit is organized based on the envisaged tasks and may include the following elements: Mobilization, Task execution to include earthwork tasks as required, Store management, Protection party (if required), and Logistics support.
		5. Special instructions, including the security plan, coordination and support mechanism other units, contingency plan, and MED/CASEVAC plan are included.
		6.Logistic supply plan (supply of construction materials, fuel, spare part for the equipment, also include food and water supply for the troops).
		7. Planning of procurement of the necessary materials by the unit if applicable.
T6.1.3	Unit Commander issues the order for construction or repair of the helipad.	1. The order describes a clear and concise statement of what the unit must accomplish (details of expected tasks).
		2. The order describes the specific activity with a specific timeframe to be accomplished by each sub-unit and earmarking correct trade personnel for the task.

		3. Requirement of resources (store & workforce with locations) including transport requirement and earth moving plant requirement.
		4. Support arrangements are coordinated with higher HQs for the requirements for the helipad.
		5. The order describes Command and control measures including reporting instructions and communication methods.
		6. Force protection measures provided / to be adopted while on move and execution of tasks.
		7. Logistical concerns/resupply of the materials and other supply considerations are instructed.
T6.2 - Conduct of Task		
T6.2.1	Unit is sufficiently self-sustained to undertake the task.	1. The unit has topographic survey equipment and trained personnel. Survey party/personnel set out the Helipad site and conducting an estimation of earthwork requirements for the repair of the Helipad.
		2. A Survey of ground levels is carried out and GPS is used to mark maps and layout sketches.
		3. The Unit is sufficiently self-sustained to undertake tasks with earthmovers including vibrating rollers, concrete mixer machine, and portable generator with a floodlight with proficient personnel as earthmoving plant operators and mason.
		4. The unit is leveling the ground, filling up the defense barriers, moving earthwork for embankment or dug in position/ shelter by using earth moving plants to include excavator loaders, dumpers, bulldozers, etc.
		5. Unit uses concrete casting of pavement or rapidly deployable landing mat.
		6. Helipad marking and setting up clear zones, markers, illuminations is performed by the unit.
T6.2.2	Construction or repair of helipads is carried out and the commander provides effective command and control.	1. Unit Commander exercises appropriate C2 during the move and execution of task (e.g., undertake resource management and caters for contingencies).
		2. Unit Commander is aware of the reporting procedures and reports progress of task to higher HQ.
		3. Safety procedures must be ensured at all times.
		4. Force protection is maintained at all times during the execution of the task.
UN Military Engineer Unit Task 6: Construction or repair of helipads. (Combat and Construction Engineering Task) (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Task 7: Construction/Maintenance of MSR/SSR

(Combat and Construction Engineering Task)

Description: A UN Military Engineers' mobilization task includes construction and repair of MSR/SSR which, for some remote locations, constitute the vital supply routes or an option for medical evacuation. This task can be suitably implemented by the construction platoon of the Engineer unit. The unit is tasked to undertake construction or repair of macadam or gravel track in a given time.

Condition: Additional Note: While constructing and rehabilitating the roads and tracks, engineering equipment are transported from the base however with the pace of progress in construction sites, it takes a long time to reach and return, Similarly, haulage between quarry site and the construction site also consumes time, which affects the working hours, efficiency/output of the troops and might causes economic burden to the UN. Considering haulage, security factors, and the availability of force, it may be better to establish a TOB as a support base for engineers working on the site.

UN Military Engineer Unit Task 7: Construction/Maintenance of MSR/SSR. (Combat and Construction Engineering Task)		
Number	Standards	Indicators
T7.1 - Planning and Preparation		
T7.1.1	Unit Commander undertakes an initial survey of the task.	1. The Commander performs an engineer appreciation for the task.
		2. Calculates time and resources required.
		3. Estimates requirements of survey, earth work, and earth moving plant requirements.
		4. Calculates store requirements for resuscitation.
		5. Calculates mobilization and deployment requirements.
		6. Assess the required plants for preparation of construction materials. (stone crusher, excavators, asphalt plants, etc.)
		7. Assess the requirements of constructing other road infrastructures (drainpipes, culverts, bridges, etc.).
T7.1.2	Unit plans for the task.	1. The Unit commander estimates details of construction material requirement.
		2. The Unit is organized based on envisaged tasks and may include: Mobilization, Preparation of construction material, Transportation of construction material to the road segment, Earthwork, leveling and compaction of earthen road, Store management, Protection party (if required), Logistics support.
		3. Planning is clearly outlined the specific period for the various stages of the construction and repair of tracks.
		4. Specific requirements, including the security plan, coordination, and support with other units, and MED/CASEVAC plan are coordinated with higher HQs.
		5. Logistic supply plan (supply of construction materials, fuel, spare parts for the equipment, also include food and water supply for the troops).

		6. Planning of procurement of the necessary materials by the unit if applicable.
T7.1.3	The Unit Commander issues an order for the construction of the track.	1. The order describes a clear and concise statement of what the unit must accomplish (details of expected tasks).
		2. The order describes the specific activity with a specific timeframe to be accomplished by each sub-unit.
		3. The order includes requirement of resources (store & workforce) to include transport requirement and earth moving plant requirements
		4. Special instructions, including the security plan, coordination and support mechanism other units, contingency plan, and MED/CASEVAC plan are included.
		5. The order describes Command and control measures including reporting instructions and communication methods.
		6. Force protection measures provided / to be adopted while on move and execution of tasks
		7. Logistical concerns/resupply of the materials and other supply considerations are instructed.
T7.2 - Conduct of Task		
T7.2.1	Unit is sufficiently self-sustained to undertake the task.	1. The unit has plants for the preparation of construction material (Stone crusher, excavators) and is able to prepare materials required for the construction of tracks (e.g., stone crushers).
		2. The unit has transportation of construction material and earthmovers (Loaders, dumpers).
		3. Plants for track leveling and compacting (bulldozer, motor graders, rollers) and an earthen track are constructed by using bulldozers, motor graders, and rollers.
		4. The Unit has proficient operators for using earth-moving plants/excavators and/or stone crushers etc.
		5. The unit has topographic survey equipment and trained personnel.
		6. Surveyors are conducting a survey to identify the best location for the track. (To be tested: Level survey work of 500 M of track segment). A survey of ground levels is carried out and GPS is used to mark maps and layout sketches.
T7.2.2	The unit executes the task as planned and the commander provides effective command and control.	1. The unit commander creates the workflow plan with earth movers.
		2. Unit Commander exercises appropriate C2 during the move and execution of task (e.g., undertake resource management and caters for contingencies).
		3. Unit Commander is aware of the reporting procedures and reports progress of task to higher HQ.

		4. Safety procedures must be ensured at all times.
		5. Force protection is maintained at all times during the execution of the task.
		6. Logistical concerns/resupply of the materials are coordinated.
UN Military Engineer Unit Task 7: Construction/Maintenance of MSR/SSR. (Combat and Construction Engineering Task) (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Task 8: Construction / dismantling of Rigid/Semi-rigid/ Prefabricated structures
(Construction Engineering Task)

Description: UN Engineers survivability tasks include construction of accommodation in camps. UN Military Construction Engineer Units are often tasked for the construction of UN provided rigid/semi-rigid/prefabricated structures in campsites in the initial phase of the mission. The unit is tasked to undertake the construction of rigid/semi-rigid/prefabricated structures including sitting of base camps.

UN Military Engineer Unit Task 8: Construction / dismantling of Rigid/Semi-rigid/ Prefabricated structures (Construction Engineering Task)		
Number	Standards	Indicators
T8.1 - Planning and Preparation		
T8.1.1	Unit Commander undertake initial survey of the task.	1. Commander performs engineer appreciation for the task.
		2. Calculates the time and resources required.
		3. Estimates the requirements of survey, earth work, and earth moving plant requirements.
		4. Assess the construction materials, the location of the storage, and transportation requirements.
		5. Assess water supply, power supply, plumbing, drainage of the site of the structures.
		6. Calculates the mobilization and deployment requirements.
		7. Calculates store requirements for construction /maintenance
T8.1.2	Unit plans for the task.	1. The Unit commander estimates details of construction material requirements.
		2. The Unit is organized based on envisaged tasks and may include: Mobilization, Task execution to include earthwork tasks as required, Store management, Protection party (if required), Logistics support.
		3. Planning is clearly outlined the specific period for the various stages of the construction or dismantling of the structures.
		4. Specific requirements, including the security plan, coordination, and support with other units, and MED/CASEVAC plan are coordinated with higher HQs.
		5. Logistic supply plan (supply of construction materials, fuel, spare parts for the equipment, also include food and water supply for the troops).
		6. Planning of procurement of the necessary materials by the unit if applicable.
T8.1.3	The Unit Commander issues orders for the construction of structures.	1. The order describes a clear and concise statement of what the unit must accomplish (details of expected tasks).
		2. The order describes the specific activity with a specific timeframe to be accomplished by each sub-unit.

		3. The order includes the requirement of resources (store & workforce) to include transport requirement and earth moving plant requirements.
		4. Special instructions, including the security plan, coordination and support mechanism other units, contingency plan, and MEDEVAC/CASEVAC plan are included.
		5. The order describes Command and control measures including reporting instructions and communication methods.
		6. Force protection measures provided / to be adopted while on move and execution of tasks.
		7. Logistical concerns/resupply of the materials and other supply considerations are instructed.
T8.2 - Conduct of Task		
T8.2.1	Unit is sufficiently self-sustained to undertake the task.	1. The unit is sufficient construction equipment such as generators, welding machines, water pumps, water trucks, concrete mixers, carpentry shops, and earth moving equipment.
		2.2. The unit has enough trained personnel such as generator operators, earthmoving plant operators, masonry workers, metalsmiths, plumbers, electricians, carpenters, and other specialists (air conditioning, heating, boiler room, etc.). (Comment: Air-conditioning is a specialist's task and will not be available at the basic engineer formation level.)
		3. The unit has the capability of transportation of construction material and earthmovers (loaders, dumpers) to the road segment.
		4. Earthwork including leveling with bulldozer, excavator, loader, dumper, motor grader, roller etc. is performed by the unit.
		5. The unit is performing masonry works to include concrete casting, brickwork & foundations.
		6. Safe electric connections, plumbing & metalsmith work are performed by the unit.
		7. Air conditioning & heating/boiler room connection is completed by the unit.
T8.2.2	The unit executes the task as planned and the commander provides effective command and control.	1. Setting up of the campsite work is done by survey personnel. A Survey of ground levels is carried out and GPS is used to mark maps and layout sketches.
		2. The drainage of the campsite is adequately addressed.
		3. Safety procedures for the construction or dismantling of structures must be ensured at all times.
		4. Unit Commander exercises appropriate C2 during the move and execution of task (e.g., undertake resource management and caters for contingencies).

		5. Unit Commander is aware of the reporting procedures and reports the progress of task to higher HQ.
		6. Force protection is maintained at all times during the execution of the task.
UN Military Engineer Unit Task 8: Construction / dismantling of Rigid/Semi-rigid/ Prefabricated structures (Construction Engineering Task) (Overall Assessment):		
Observation & Recommendations		

MILENG Unit Task 9: Construction & Repair of drainage works

(Construction Engineering Task)

Description: To prevent any type of disputes between the local population and the UN staff, managing surface water and wastewater is an important function. Managing such water is also important in terms of hygiene and sanitation. Establishing effective drainage for managing surface and wastewater or constructing a ditch is one of the solutions to harmonious living between the locals and the UN. The unit is tasked to undertake the construction of drainage works in a given time.

UN Military Engineer Unit Task 9: Construction of drainage works. (Construction Engineering Task)		
Number	**Standards**	**Indicators**
T9.1 - Planning and Preparation		
T9.1.1	Unit Commander undertake initial survey of the task.	1. Commander performs engineer appreciation for the task.
		2. Calculates the time and resources required.
		3. Estimates the requirements of survey, earthwork, and earthmoving plant requirements.
		4. Assess the required construction materials, the location of the storage, and transportation requirements.
		5. Survey personnel are performing a survey of ground levels and water flow patterns.
		6. The unit commander estimates details of construction material requirement.
		7. Calculates the mobilization and deployment requirements.
T9.1.2	The unit commander issues orders for the construction/improvement of drainages.	1. The order describes a clear and concise statement of what the unit must accomplish (Details of expected task).
		2. The order describes the specific activity with a specific timeframe to be accomplished by each sub-unit.
		3. Requirement of resources (store & workforce) to include transport requirements and earthmoving plant requirements.
		4. The order provides details of the survey and water flow patterns.
		5. Force protection measures provided / to be adopted while on move and execution of tasks
		6. The order describes Command and control measures including reporting instructions and communication methods.
		7. Special instructions, including the security plan, coordination and support mechanism other units, contingency plan, and MED/CASEVAC plan are included.
		8. Logistical concerns/resupply of the materials, and other supply considerations are instructed.

T9.2 - Conduct of Task		
T9.2.1	The unit is sufficiently self-sustained to undertake a task.	1. The unit has sufficient construction equipment such as generators, welding machines, water pumps, water trucks, concrete mixers, carpentry shop, and earth moving equipment.
		2. The unit has enough trained personnel such as generator operators, earthmoving plant operators, masonry specialists, metalsmiths, plumbers, electricians, carpenters, and other specialists.
		3. A Survey of ground levels is carried out and GPS is used to mark maps and layout sketches.
		4. Earthwork including leveling with Bulldozer, excavator, loader, dumper, motor grader, roller, etc. are performed by the unit.
		5. Concrete casting and masonry works are performed by the unit (if required).
		6. The Unit Commander exercises appropriate C2 during the move and execution of task (e.g., undertake resource management and caters for contingencies).
		7. The Unit Commander is aware of the reporting procedures and reports the progress of task to higher HQ
		8. Safety procedures for road construction or maintenance must be always ensured and force protection is maintained at all times during the execution of the task.
UN Military Engineer Unit Task 9: Construction of drainage works. (Construction Engineering Task) **(Overall Assessment):**		
Observation & Recommendations		

MILENG Unit Task 10: Airfield maintenance

(Construction Engineering Task)

Description: A UN Military Engineers mobilization task includes maintenance of an Airfield. Airfield maintenance must adequately address the ICAO technical specifications or specifications set by the UN Aviation safety authorities. Certification of the maintenance work is of utmost importance. This task is a specialist tasking however support could be provided by the Construction Engineering Unit to assist with the airfield maintenance.

UN Military Engineer Unit Task 10: Airfield maintenance. (Construction Engineering Task)		
Number	Standards	Indicators
T10.1 - Planning and Preparation		
T10.1.1	Unit Commander undertake initial survey of the task.	1. Commander coordinates with UN Aviation safety authorities to identify technical specifications or ICAO specifications for the airfield maintenance.
		2. Commander performs engineering appreciation for the task and calculates the time and resources required.
		3. Coordinates with specialists to receive the specifications for the airfield maintenance task that is given to the unit.
		4. Estimates the requirements of survey, earthwork, and earthmoving plant requirements if necessary to assist the airfield maintenance.
		5. Assess the construction materials, the location of the storage, and transportation requirements.
		6. Assess water supply, power supply, plumbing, drainage of the site of the structures.
		7. Calculate the mobilization and deployment requirements.
T10.1.2	The unit provides necessary support to assist with airfield maintenance.	1.The unit commander creates the workflow plan for assisting the airfield maintenance. (with a sketch, map, all calculations of the required equipment etc.).
		2. Planning is clearly outlined the specific period for the various stages of supporting the maintenance of the airfield.
		3. The order provides the specific requirements and liaison instruction with the airfield maintenance authority.
		4. Requirement of resources (store & workforce with locations) including transport requirement.
		5. The order describes Command and control measures including reporting instructions and communication methods.
		6. Force protection measures provided / to be adopted while on move and execution of tasks.
		7. Logistical concerns/resupply of the materials and other supply considerations are instructed.

T10.2 - Conduct of Task		
T10.2.1	The unit commander plans and issues the order to provide support to airfield maintenance.	1. Airfield maintenance task is executed with close coordination with airfield maintenance authority.
		2. The Unit is sufficiently self-sustained to undertake tasks and has the ability to provide all necessary support to maintain the airfield. (Comment: Earthmoving, performing masonry works, levelling the ground, concrete casting of pavement or landing mat, marking and setting up clear zone, markers, illuminations etc. as per required specifications.)
		3. Safety procedures must be ensured at all times.
		4. Unit Commander exercises appropriate C2 during the move and execution of the task (e.g., undertake resource management and caters for contingencies).
		5. Unit Commander is aware of the reporting procedures and reports the progress of task to higher HQ.
		6. Force protection is maintained at all times during the execution of the task.
UN Military Engineer Unit Task 10: Construction of drainage works. (Construction Engineering Task) **(Overall Assessment):**		
Observation & Recommendations		

MILENG Unit Task 11: Well drilling

Description: UN Military Engineers' survivability tasks include the provision of water for the UN personnel. Well-drilling is a viable solution for provisioning water in severe drought conditions for several missions. The unit is tasked to conduct well drilling and maintain several boreholes.

Condition: Well drilling and maintenance of boreholes is a specialist task and a specialist construction unit with the necessary well drilling equipment would be required depending on the MOU.

UN Military Engineer Unit Task 11: Well drilling		
Number	Standards	Indicators
T11.1 - Planning and Preparation		
T11.1.1	Unit Commander undertake initial survey of the task.	1. Commander performs engineer appreciation for the task.
		2. Calculates the time and resources required. Also, calculates store requirements for well drilling
		3. Utilizes the available geological survey estimates and selects the most suitable site administratively and security-wise.
		4. Estimates the requirements consumables based on the geological survey result and maintain liaison with the Mission Support for planning continuous supply of consumables.
		5. Ensure coordination with other services, such as medical for testing and the Engineering section for the supply of consumables.
		6. Calculates store requirements for well drilling.
		7. Calculates the mobilization and deployment requirements.
		8. The Unit is organized based on envisaged task and may include: Mobilization, Task execution to include earthmover operators, well drilling rig operators, welders, plumbers, electricians etc., Store management (consumables), Operation and maintenance of Well, Protection party (if required), Logistics support.
T11.1.2	The Unit Commander issues order for well Drilling.	1. The order describes a clear and concise statement of what the unit must accomplish (details of expected task).
		2. The order describes the specific activity with a specific timeframe to be accomplished by each sub-unit.
		3. The order includes the requirement of resources (store & workforce) to include transport requirement and earthmoving plant requirements.
		4. Special instructions, including the security plan, coordination and support mechanism other units, contingency plan and MED/CASEVAC plan are included.
		5. The order describes Command and control measures including reporting instructions and communication methods.

		6. Force protection measures provided / to be adopted while on move and execution of tasks.
		7. Logistical concerns/resupply of the materials and other supply considerations are instructed.
		8. Coordination with other services to ensure testing and movement control.
T11.2 - Conduct of Task		
T11.2.1	Unit is sufficiently self-sustained to undertake the task.	1. The unit is sufficient well drilling and construction equipment such as generators, well drilling rigs, welding machines, water pumps, water trucks, concrete mixers, carpentry shops, earth moving equipment, and consumables.
		2. The unit is prepared for task execution to include earthmover operators, well drilling rig operators, water testing facility operators, welders, plumbers, electricians etc.
		3. The unit sets up the well drilling rig with standard equipment.
		4. The unit estimates and calculates the required consumables and maintains a store list.
		5. Plumbers/Welders/generator Operators can operate their machine/equipment and other accessories proficiently in coordination with rig operators.
		6. The Unit Commander exercises appropriate C2 during the move and execution of task (e.g., undertake resource management and caters for contingencies).
		7. The Unit Commander is aware of the reporting procedures and reports the progress of the task to higher HQ.
		8. Safety procedures must always be ensured, and force protection is always maintained during the execution of the task.
UN Military Engineer Unit Task 11: Well drilling (Overall Assessment):		
Observation & Recommendations		

Appendix 3 to Annex E (Sample In-Mission Evaluation Checklists)

Suggested evaluation criteria scoring levels.

0. Not mission capable.
1. Not yet mission capable with major capability deficiencies
2. Not yet mission capable with minor deficiencies
3. Mission capable with improvements highly recommended
4. Mission capable with minor improvements recommended.
5. Fully mission capable

Serial	Evaluation Criteria	Evaluation (0 to 5)	Remarks
a.	Performance. Does the unit plan and perform all MET effectively and safely as per Mission mandate(s), peace operations norms and Mission SOPs?		
b.	Shortcomings. Has the unit taken corrective action on shortcomings in performance or resources observed by the unit, COE team or Mission leadership?		
c.	On-The-Job Training. Does the chain of command institute measures for on-the-job training of all personnel (based on their basic job categories) to maintain qualification standards?		
d.	In-Mission Training. Is the unit carrying out periodic in-Mission refresher, task-oriented and Mission-specific training as per IMTC guidelines?		
e.	Counter-IEDs. Is the Unit trained in the current hazards/threat and related of search capabilities, EO and IEDs?		
f.	Serviceability. Is the unit carrying out periodic inspection, preventive maintenance and repairs on time and replacing items that are unserviceable?		
g.	Conduct and Discipline. Does the unit continue to maintain high standards of conduct and discipline in all ranks?		
h.	Outreach and Engagement. Has the unit been able to establish (where relevant) good rapport and effective interface with the local population through CIMIC, Quick Impact Projects and welfare activities?		

Additional Comments:

Annex F – Examples of Best Practices

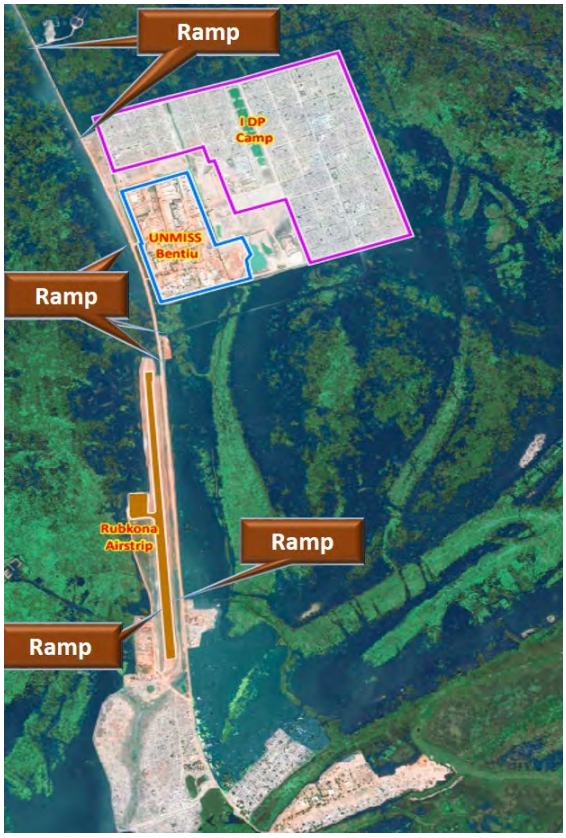
The following annex presents a series of images depicting scenarios and tasks that military engineers may encounter. These visuals are intended to illustrate various challenges and potential solutions, while deliberately omitting excessive technical details. The photographs and accompanying descriptions, provided by UNMISS, are broadly relevant to a wide range of peacekeeping missions.

1. Compartmentalization / Ramps

Flood Mitigation measures have been adopted at Bentiu against floodings.

25 kms x dyke system has been compartmentalized by making ramps to prevent flooding of complete section of MSR and Rubkona Airstrip (in case of dyke breach).

7 x Ramps (6’ height each) have been constructed to make distinct compartments along MSR.



2. Construction of Side Water Drains

Due to the heavy rains during the wet season, maintaining the flow of traffic on the Main Supply Route (MSR) is crucial to ensure FOM. De-watering operations are conducted after each rainfall; however, rainwater still deteriorates the road surface and reduces trafficability. To mitigate the issue of slushy roadway conditions, side water drains have been excavated to collect and channel rainwater for de-watering. This intervention has significantly improved traffic flow post-rain and has markedly reduced the required maintenance effort.

De-watering of MSR **without** Drains

De-watering of MSR **with** Drains

3. Maintenance of MSR

Before

During

After

Before

During

After

Before

During

After

Soil covering the tube should be ⅓ of the diameter.

Before

During

After

4. Perimeter Fencing

5. Construction

Construction and Uplifting of Dining Hall and Cook House

Quality of life and functionality are intertwined to enhance the productivity of troops in the field. To improve aesthetics and functionality, efforts have been made to ensure proper ventilation, designate separate cooking and cleaning areas, and enhance hygiene conditions. The layout of the cookhouse and dining hall has been upgraded, and new prefabricated structures, kitchens, and bathrooms have been constructed.

Installation of Prefabs, Kitchens, and Bathrooms

6. Drainage Work

7. Recovery of aircraft


African


U N

8. Tree Plantation / Gardening

Global warming is impacting climate conditions. Trees and vegetation play a crucial role in mitigating these effects by supporting a microclimate, reducing elevated temperatures, and improving air quality. To this end UNMISS MILENG unit initiated a tree and flower planting campaign within the camp area. This initiative has not only enhanced the aesthetic appeal but also contributed to a healthier environment, with lush greenery and vibrant flowers enriching the surroundings.


FATHER OF THE NATION

9. CIMIC activities

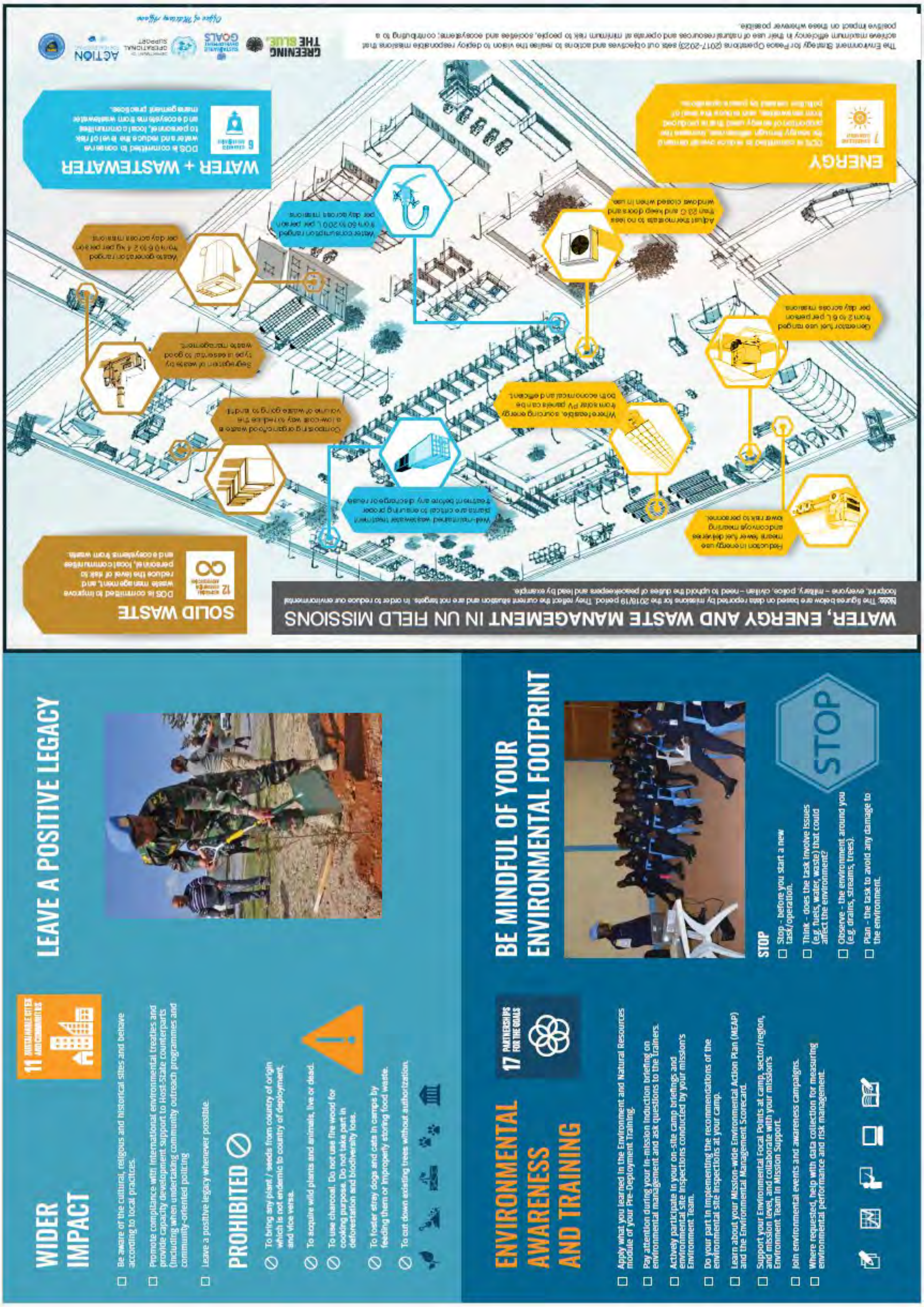
UNMISS MILENG unit supported the construction of a communal sport field to host sport events with local communities, foster cordial relationships and promote a healthy, active lifestyle.

10. Capacity building

Water Pump Cadre. Skill development of locals at Bentiu is an important progress towards uplifting and improving their standards of life. Water Pump Cadre has been successfully conducted by UNMISS Engineer unit at Bentiu Camp

Annex G – Peacekeeping Mission Card

Reducing the Environmental Footprint of Field Missions


WIDER IMPACT
Be aware of the cultural, religous and historical sites and behave according to local practices.
Promote compliance with international environmental treaties and provide capacity development support to Host-State counterparts (including when undertaking community outreach programmes and community-oriented policing
Leave a positive legacy whenever possible.
PROHIBITED
To bring any plant / seeds from country of origin which is not endemic to country of deployment, and vice versa.
To acquire wild plants and animals, live or dead.
To use charcoal. Do not use fire wood for cooking purpose. Do not take part in deforestation and biodiversity loss.
To foster stray dogs and cats in camps by feeding them or improperly storing food waste.
To cut down existing trees without authorization.
LEAVE A POSITIVE LEGACY
ENVIRONMENTAL AWARENESS AND TRAINING
Apply what you learned in the Environment and Natural Resources module of your Pre-Deployment Training.
Pay attention during your in-mission induction briefing on environmental management and ask questions to the trainers.
Actively participate in your on-site camp briefings and environmental site inspections conducted by your mission's Environment Team.
Do your part in implementing the recommendations of the environmental site inspections at your camp.
Learn about your Mission-wide Environmental Action Plan (MEAP) and the Environmental Management Scorecard.
Support your Environmental Focal Points at camp, sector/region, and mission level, and collaborate with your mission's Environment Team in Mission Support.
Join environmental events and awareness campaigns.
Where requested, help with data collection for measuring environmental performance and risk management.
BE MINDFUL OF YOUR ENVIRONMENTAL FOOTPRINT
STOP
Stop - before you start a new task/operation.
Think - does the task involve issues (e.g. fuels, water, waste) that could affect the environment?
Observe - the environment around you (e.g. drains, streams, trees).
Plan - the task to avoid any damage to the environment.
STOP
WATER, ENERGY AND WASTE MANAGEMENT IN UN FIELD MISSIONS
SOLID WASTE
WATER + WASTEWATER
ENERGY
GREENING THE BLUE
ACTION

Annex H - Environmental Good Practices in the context of liquidation and camp closure (Example)

1. INITIAL INFORMATION AND DATA COLLECTION

Site use

Type of installations present on site (check all boxes that apply)		
☐ Logistic base (warehouses) ☐ Fuel farm ☐ Property Disposal (PDU) yard ☐ Diesel power generator house ☐ Renewable power generation ☐ Airfield + aircraft hangar ☐ Docking facility + boat repair hangar ☐ Vehicle maintenance workshop + carwash ☐ Protection of civilians (POC) site ☐ ϒ Community burial site / cultural heritage site	☐ Telecommunication tower ☐ Surface water pumping station ☐ Groundwater abstraction borehole ☐ Wastewater treatment plant ☐ Domestic + drinking water treatment plant ☐ Storage of expired chemicals ☐ Firing range ☐ Unexploded ordonnance disposal site ☐ Ammunition storage	☐ Waste dumping site or landfill ☐ Biomedical waste incinerator ☐ Food burying pit ☐ Waste burning pit ☐ Biomedical waste pit (emergency) ☐ Incineration ash pit ☐ Oxidation pond ☐ Sewage sludge drying bed ☐ Quarry (sand, murram, white cotton, rock)
Others		

Documentation to consult prior or during the site visit (ask for copies to the field office or Mission HQ)

Documentation available (check all boxes that apply)		
☐ Official lease agreement, permit or authorization to use the land	☐ Environmental Baseline Study	☐ Waste disposal records, including biomedical waste and hazardous waste
☐ Site layout + general arrangement	☐ Environmental Impact Assessment	☐ Wastewater discharge quality data
☐ Electrical, water and wastewater utilities network plans (as built)	☐ Environmental focal point reports and records	☐ Environmental & community incident reports
☐ GIS maps	☐ Environmental inspection reports	☐ Material Safety Datasheets for the chemicals and hazardous materials

Areas that must be visited during the reconnaissance / initial field visit

Areas visited during the field visit **(check the boxes for all the areas that have been visited, including in the main UN camp and at TCC/PCC camps if applicable)**		
☐ Logistic base (warehouses) o Fuel farm ☐ Property Disposal (PDU) yard ☐ Diesel power generator house ☐ Renewable power generation (and batteries) ☐ Airfield + aircraft maintenance hangar(s) ☐ Docking facility + boat repair hangar(s) ☐ Vehicle maintenance workshop(s) + carwash ☐ Protection of civilians (POC) site ☐ Telecommunication tower(s) ☐ Surface water pumping station(s) ☐ Groundwater abstraction borehole(s)	☐ Septic tank(s) + lift / transfer station(s) ☐ Wastewater treatment plant(s) ☐ Domestic + drinking water treatment plant ☐ Grease traps + oil/water separators ☐ Stockpiles of expired chemicals / hazardous waste ☐ Waste collection area(s) ☐ Used oil / POL storage shed(s) ☐ Waste dumping site or landfill (onsite and/or off-site) ☐ Biomedical waste incinerator ☐ Stockpile(s) of biomedical waste + expired medicine / drugs	☐ Food burying pit(s) ☐ Waste burning pit(s) ☐ Biomedical waste disposal pit (emergency) ☐ Incineration ash pit / disposal site ☐ Oxidation pond / sewage sludge disposal site (onsite and/or off-site) ☐ Sewage sludge drying bed ☐ Firing range ☐ Unexploded ordonnance disposal site ☐ Ammunition storage ☐ Quarry (sand, murram, white cotton, rock)
Others:		

Evidence of environmental pollution and degradation to pay special attention to

- Waste littering, including in the drainage ditches
- Untreated blackwater discharge
- Untreated greywater discharge, including from kitchens, maintenance workshops and carwash
- Evidence of overflows of wastewater around septic tanks, lift / transfer stations, wastewater treatment plants, grease traps and/or oil-water separators
- Stockpiles of drums, barrels, ISO containers compressed gas cylinders, and other containers that may contain or have contained POL, chemicals, and hazardous waste
- Evidence of leakage from pipes, including accumulation of liquid or unusual soil depression in the area of buried sewage / water / fuel lines
- Corrosion of fuel storage tanks, septic tanks, wastewater treatment plants, sewage lines, fuel lines, etc.
- Foul smelling pool of standing water
- Stockpiles of construction / demolition waste
- Evidence of soil contamination (stain, smell, oily water)
- Visible signs of waste burning
- Pits and surface depression covered with metal sheets, planks of wood or other types of cover, which may indicate the presence of a food / waste burial pit
- Written-off vehicles and equipment storage yard, including air conditioning units, portable fire extinguishers (which may contain ozone depleting substances) and old appliances
- Stockpiles of biomedical waste, pesticides, and expired medicine / drugs
- Deforested areas within the camp that is not currently used for facilities or storage
- Signs of past flooding of facilities and camp

2. Best Practices Environmental Restoration and Clean-Up Activities

All of the best practices in environmental restoration and clean-up activities listed below generally need to be implemented, unless it has been formally agreed with the landowner or the authorities that these measures are not required. Such a formal agreement must be documented and approved by the Mission Legal Affairs Unit. If some facilities or equipment (ex. fuel tanks, generators, water, and wastewater treatment plants) are to be handed over to the landowner or donated, the Site Closure Team must ensure that the future user of the facilities or equipment has the capacity to safely and sustainably use these facilities. Likewise, the Site Closure Team must ensure that any contractor or individual that is interested in recovering some of the scrap and waste material has the capacity to properly manage the material in a safe and environmentally responsible manner.

Note: all checked boxes must be added to site closure workplan

	Measure	Applicable to the current site and to be added to the site closure workplan
1.	**Hand-over / donation of buildings, equipment, and waste material** • In coordination with the Legal Affairs Unit and the Property Disposal Unit, investigate the possibility of handing-over or donating to the landowner, the authorities, and/or the local community the buildings that are still safe to use. • Before handing-over or donating buildings, ensure that the future user(s) have the capacity to safely use and maintain the building. • It is not recommended to hand-over prefabricated containers to the landowner, the authorities, or the local community unless they are in excellent condition and can likely be safely used for several years. • In coordination with the Legal Affairs Unit and the Property Disposal Unit, investigate the possibility of handing-over or donating to the landowner, the authorities and/or the local community equipment that is still safe to use (ex. generators, vehicles, computers, printers, etc.). • In coordination with the Property Disposal Unit, investigate the possibility of donating scrap metal, electrical cables (containing copper) and other waste material to the local community for reuse, recycling, or local valorization.	☐ Yes
2.	**Fuel and POL storage tank(s) and container(s)** • Collect the fuel and POL left in the tank and use or send for recycling. • Wash the inside of the tank to remove all fuel and POL, recover the oily water and treat it using an oil/water separator or absorbent. • Remove the tanks from site and transport them to another UN camp for reuse. • Remove all fuel and POL lines, piping, and pumps, both those located aboveground and those buried.	☐ Yes
3.	**Used oil / POL storage shed(s)** • Empty the shed by collecting all used oil / POL containers and transferring them to the fuel contractor. • Clean the concrete pad surface, recover the oily water, and treat it using an oil/water separator or absorbent. • Demolish the concrete pad and manage it as detailed below.	☐ Yes
4.	**Waste collection points** • Empty the waste collection point by removing all waste material and bins, ensuring proper waste segregation and disposal as per the site's normal procedures. • Clean the concrete pad surface, recover the oily water, and treat it using an oil/water separator or absorbent. • Demolish the concrete pad and manage it as detailed below.	☐ Yes

Measure		
	Applicable to the current site and to be added to the site closure workplan	
5.	**Septic tanks, sewage lift / transfer stations, wastewater treatment plants** • Empty the liquid content and remove the sludge, and properly dispose of liquid waste and sludge as per the site's normal procedures. • Disinfect the interior surface using a chlorine solution. • Remove / excavate all buried septic tanks, lift / transfer stations and WWTP components. • Remove all aboveground WWTP components. • If possible, transport the WWTP components to another UN camp for reuse. • If no reuse is possible, dismantle the metal septic tanks and WWTP component and salvage the scrap metal as detailed below. • Demolish the concrete pads and manage as it as detailed below, crush the concrete debris, and use them as backfill material.	☐ Yes
6.	**Hesco bastions** • Deconstruct the Hesco bastions instead of crushing them. • Recover the metal meshing and manage the resulting scrap metal as detailed below. • Dispose of the bastion fabric as general domestic waste as per normal site procedure or offer it to the local community for reuse.	☐ Yes
7.	**Prefabricated containers (accommodations, offices, and ablutions) that are not handed over or donated** • Investigate the option of removing the prefabricated containers that are in good condition and move them to another field location for reuse. • If not in condition that allows reuse or safe hand-over, deconstruct the prefabricated containers by dismounting the wall structures and by removing all plumbing and electrical material, and the insulation foam material. • Recover the metal walls and frame and manage the scrap metal as detailed below. • Dispose of the insulation foam as general domestic waste as per normal site procedure (do not burn it as it will generate toxic fumes). • Recover the electrical cables (containing copper) and the steel piping, and hand them over to the PDU waste contractors form recycling or to the local community if recycling options in the area are available.	☐ Yes
8.	**Pipes and cables (water, wastewater, electrical and telecommunication)** • Remove all aboveground piping and dispose of as per normal site procedure. • Leave buried piping in place but plug both ends for wastewater / sewage lines (as stated above, all buried fuel / POL lines are to be removed).	☐ Yes
9.	**Dumping site** • Ensure that there are no hazardous waste / expired chemicals in the dumping site; if so, collect the hazardous waste / expired chemicals and manage them as detailed below). • Backfill the dumping site(s) located on-site, providing at least 1 m of topsoil cover over the waste. • Profile the surface around the backfilled dumping site to prevent water runoff from flowing towards the dumping site (i.e., raising the surface of the backfilled dumping site above the surrounding area, using berms, drainage channels).	☐ Yes
10.	**Food pits and composting pits** • Remove the pit cover and backfill the pit(s) using topsoil or treated contaminated soil.	☐ Yes
11.	**Drainage channels** • Remove all litter and waste material from the drainage channels. • Leave the drainage channels in place, unless it is requested by the landowner to backfill them.	☐ Yes

Measure		
	Applicable to the current site and to be added to the site closure workplan	
12.	**Old quarry (murram, white cotton soil, rock)** • Stabilize the quarry' slope to ensure public safety by flattening the slopes based on professional advice by a qualified engineer (if available) or to a default 45-degree slope. • Block the quarry access road by building a berm or digging a trench across the road. • Remove the stockpile of material located at the crest of the quarry where the material could fragilize the slope as determined by a qualified engineer (if available) or within 5 m of the crest (default) if it safe to do so.	☐ Yes
13.	**Used oil / POL** • Collect and hand over to the Fuel / POL contractor as per normal procedure.	☐ Yes
14.	**Expired chemicals and hazardous waste** • Collect and hand over to the selected hazardous waste contract (if any) or transport to another duty station for safe storage and future recycling. • Use expired chlorine and/or lime to disinfect sewage sludge and disinfect wastewater equipment. • Use expired pesticides for their intended use if they are expired for less than 36 months.	☐ Yes
15.	**Expired ammunition and unexploded ordonnance** • Ensure safe management by specialists as determined by the Mission Headquarters.	☐ Yes
16.	**Contaminated soil (fuel, POL contamination)** • Excavate all visible contaminated soil (surface and below the surface). • Treat the contaminated soil on site using bioremediation procedures using compost, dried up sludge or animal manure. • Once treated, use the decontaminated soil as backfill material on site.	☐ Yes
17.	**Scrap metal** • Transfer the salvaged scrap metal to the metal recycling contractor (contact the PDU unit) or to the local community if there are local metal recycling / reuse options. • If there are no contractor or local recycling / reuse options, transport the scrap metal back to the nearest field office for future recycling.	☐ Yes
18.	**Concrete structures** • Demolish the concrete structures, crush the concrete debris (ideally in chunks measuring less than 15 cm in length) and use them as backfill material.	☐ Yes

Additional environmental restoration, remediation, and clean-up activities to be added to the site closure workplan (add lines if required)

1.
2.
3.

Annex I - Guidance on responsible environmental management for Temporary deployments

A. Introduction

When not managed in a responsible manner, UN Peace Operations can have a significant impact on the local environment and the host community. Environmental protection is a strategic priority for the United Nations and the Member States, as highlighted by several resolutions from the UN General Assembly and the Security Council.

In field missions, military and police formed units play a key role in ensuring that operations are conducted in a way that does not harm the host community and the local environment. As directed by the Memorandum of Understanding (MOU) signed between the UN and Troop and Police Contributing Countries (T/PCC), formed military and police units are required to observe a policy of no littering around the bases and on patrols, and to take concrete steps to conserve water and energy, reduce and segregate waste and properly manage hazardous waste and wastewater for which they are responsible. In addition, as per the MOU, formed units will leave the premises and physical environment in the conditions in which they were provided to them.

These principles apply to all activities conducted by formed military and police units, including in temporary deployment activities, where a contingent conducts tasks outside the UN operating bases for several days at a time. Significant efforts have been made by the United Nations and formed units to improve environmental practices in main and permanent operating bases over time. It is as equally important that environmentally responsible practices are implemented during temporary deployments, using adapted, realistic, and achievable measures.

B. Aim

The annex aims at providing guidance and practical advice to commanding officers on the environmentally responsible practices to implement during temporary deployments, such as how to manage wastewater and solid waste in a responsible and safe manner, and on how to prevent fuel and chemical spills and related soil and water contamination. Its overarching goal is to provide field adapted solutions to conduct mandated operations while doing no harm to the host community and the local environment and protecting the reputation of the formed unit and of the UN as responsible peace partners.

The practices recommended in this annex are deemed to be realistic and achievable in most field operational contexts, without requiring resources beyond the typical capacity of military units deployed at UN missions.[115]

[115] Additional guidance on environmental management in the context of the UN Peace Operations may be found in the

- UN Environmental Handbook for Military Commanders
- Environmental Policy for Peacekeeping Operations and Field-Based Special Political Missions
- Water and Wastewater Manual for Peacekeeping and Special Political Missions in the context of field operations
- Waste Management Handbook for Peacekeeping Operations and Field-Based Special Political Missions

C. Scope

This guidance applies to temporary deployment activities carried out by all types of military units in UN Peace Operations, including the following activities:

- Short-duration patrols, long-duration patrols, standard combat deployments, combat transport, and similar types of activities carried out away from the unit's main operating base or other UN support base.
- Temporary operating bases (TOB) and patrol operating bases, and similar types of temporary bases.
- Main supply road repairs and other engineering activities, and convoy security / force protection activities where the establishment of a temporary camp is required.

The proposed environmental management approaches detailed in this annex have been developed to apply to the self-sustainment phase of temporary deployments outside UN main and permanent operating bases.

As such, the establishment of permanent operating bases is outside the scope of this guidance annex, and other guidance documents must be consulted.

D. Limitations

This annex is intended to provide minimum standards on how to minimize human health and environmental risks related to wastewater and solid waste management, and to spill prevention during multiple-day operations conducted outside main and permanent UN bases. When the host mission has promulgated directives, standard operating procedures or other such guidance documents for temporary deployments, these documents take precedence.

Similarly, when the host mission is providing standard combat deployment kits or similar deployment kits to military formed units conducting off-base activities, these kits are to be used as a matter of priority. When the kits do not provide equipment to manage wastewater and/or solid waste material, this annex is then to be used as a reference by commanding officers to ensure responsible and safe management of such waste materials during temporary deployments.

E. Responsibilities

Military commanding officers are responsible for implementing UN environmental guidance as required by the MOU. In the context of temporary deployments, and other activities within the scope of this annex, the commanding officers are responsible for ensuring that:

- No harm is done to the local environment, the host community and community livelihood.
- No littering of waste occurs.
- No discharge of untreated wastewater directly into streams, rivers, groundwater, other bodies of water, or outside the established temporary operating base occurs.
- No hazardous or biomedical wastes are discharged to land, water, or atmosphere without prior treatment appropriate to the waste type.

Environmental focal points at unit, sector or Force HQ level, the Mission Support Center, the Mission Engineering Section, and the Mission Environment Unit may be contacted by military commanding officers for additional technical advice.

1. Wastewater management – recommended practices

Two types of wastewaters may be generated in temporary deployment settings:

a. blackwater from toilets and human waste; and

b. greywater from field showers and field kitchens.

Both types of wastewaters must be managed properly to reduce risks to human health, both for the personnel and the host community, and to reduce the impacts on the local environment. Practices aimed at preventing or minimizing the generation of oily water are detailed in section 3.

In temporary deployments, the amount of wastewater generated by the contingent is expected to be minimal as sanitation facilities used are generally not connected to a running water network during the self-sustainment phase. Consequently, the main options available for commanding officers to ensure the safe and responsible management of wastewater during temporary deployments are the following:

- Use of portable field toilet / shower unit and portable / chemical toilets.
- Construction of field / pit latrines.
- Construction of field showers with soak pits.
- Use of existing water and sanitation facilities, when proper.

1.1 General principles

Untreated wastewater shall not be discharged in open water bodies or drainage channels under any circumstances. Untreated wastewater shall not be allowed to flow outside the temporary operating base under any circumstances. Piping must be used to convey untreated wastewater from the point of generation to the point of disposal. Conveyance of untreated wastewater using open trenches or channels is prohibited due to the risk to human health.

1.2. Portable field toilet/shower/washbasins, portable field toilets or portable / chemical toilets

When available, the use of portable field toilet/shower/washbasins or portable toilet facilities is advisable in temporary deployment settings as such units are readily deployable and their use does not require extensive engineering work. Whether contingent-owned or UN-owned, these facilities are generally composed of prefabricated enclosed toilet cabinets with or without showers, and with basic sanitation facilities, mounted on a vehicle or trailer. They are typically equipped with wastewater / sewage holding tanks. Figure 1 presents examples of portable field toilet/shower/washbasin and portable toilet facilities.

Figure 1. Examples of portable field toilet/shower/washbasin and portable toilet facilities

When using a portable field toilet/shower/washbasin or portable toilet facility, the full volume of wastewater generated should be stored and hauled back to the unit home base or the nearest main operating base for proper disposal in a UN wastewater treatment facility or governmental facility. If wastewater needs to be disposed of before coming back to the unit home base or another permanent operating base (i.e. tank is full or unit is faulty), it may be disposed of in a locally available government approved sewage disposal site, in an existing septic tank, or in a sewage disposal pit, located and built as detailed at Table 1.

Alternatively, the blackwater flow generated by a portable toilet/shower/washbasin or portable toilet facilities may be directed, using piping, to such a sewage disposal pit, or existing septic tank, located inside the temporary deployment camp. The greywater flow generated by the portable field shower unit (or shower section of the combined field toilet / shower unit) may be discharged into a soak pit built in accordance with Table 3.

Chemical toilets are self-contained and require the usage of chemical additives to minimize odor. They must be emptied regularly to avoid overflows of untreated wastewater. If not returned to the unit home base (or other UN main or permanent operating base), sewage from chemical or portable toilets may be disposed in a locally available government approved sewage disposal site, in an existing septic tank, or in a sewage disposal pit, located and built as detailed at Table 1.

Table 1: Sewage disposal pit

Location	Sewage disposal pit(s) must be located more than 30 meters away from any borehole / surface well / water point used by the community for water supply, laundry, bathing, or livestock watering, and from any water body, river, creek, steam, or drainage channel. Such pit(s) must be located in an area where soil excavation is possible. Rocky outcrops are not proper locations for sewage disposal pits.
Construction	Prepare an excavation of at least 150 centimeters deep and large enough to contain the full volume of sewage that is expected to be generated during the deployment. Make sure that the bottom of the pit is not wet or damp before using it; if the bottom remains wet, this may indicate that the water table is high, and an alternative location must be found. If used in conjunction with a portable field toilet unit, direct wastewater from the toilet unit to the excavated pit using piping only. Keep the excavated soil aside to backfill the pit after use.
Other considerations	If blackwater and greywater are collected separately in the portable ablution / shower unit, greywater may be disposed in a soak pit as detailed at Table 3 while blackwater must be disposed in a locally available government approved sewage disposal site, in an existing septic tank, or sewage disposal pit.

When leaving the area, or when the pit fills up to 50 centimeters from the ground surface, properly close the sewage disposal pit by:

- Spreading lime or a chlorine disinfecting diluted solution (when available) on the accumulated excreta.
- Properly backfilling the pit(s) with the excavated soil.
- As much as possible, compacting the backfill area to reduce vermin access to the human waste, using mechanical means or manually.

1.3 Field / pit latrines and soak pits

Prefabricated or built-in place, field / pit latrines may be used to collect excreta and urine when no running water or little running water is available (pour flush toilet or dry toilet). This is generally the case during the self-sustainment phase of a temporary deployment. Field / pit latrines are to be located and constructed as detailed at Table 2 below.

Table 2: Field / pit latrines for blackwater

Location	Field / pit latrines must be located more than 30 meters away from any borehole / surface well used by the host community, and from any water body, river, creek, stream, or drainage channel. Such latrine(s) must be located in an area where soil excavation is possible. Rocky outcrops are not proper locations for field / pit latrines.
Construction	Dig a pit or a trench at least 100 cm deep; ideally the bottom of the pit / trench is 3 meters or more above the groundwater level. Make sure that the bottom of the pit is not wet or damp before using it; if the bottom remains wet, this may indicate that the water table is high, and an alternative location must be found. Keep excavated soil aside to backfill the pit after use. Install / construct field latrines over the excavated pit or trench or directing wastewater from the field latrines to the excavated pit using piping. Install a temporary shelter or structure providing privacy and preventing ingress of rainwater, over the excavated pit or trench. Provide hand washing facilities with soap or hand sanitizer.
Other considerations	It is suggested to install / construct at least one field latrine for every 20 troops and an adequate number of field latrines for the female staff, providing proper gender separation.

When leaving the area, or when a pit / trench fills up to 50 centimeters from the ground surface, properly close the field / pit latrine site by:

- Removing the temporary shelter / structure.
- Spreading lime or a chlorine disinfecting diluted solution (when available) on the accumulated excreta.
- Properly backfilling the pit(s) and trench with the excavated soil.
- As much as possible, compacting the backfill area to reduce vermin access to the human waste, using mechanical means or manually.

If additional pits are required (e.g., when the unit presence in the area is extended), repeat the steps above.

1.4 Field showers and soak pits

Greywater generated by field showers must also be managed in a safe and environmentally responsible manner. Greywater from field showers may be reused or disposed in soak pits as detailed in Table 3. Similarly, greywater generated by field kitchens must also be disposed in a soak pit (the same soak pit may be used for greywater from showers and kitchens), after flowing through a prefabricated or make-shift grease interceptors (any container allowing for the retention of grease and fats while allowing water to flow through). To collect food debris, field kitchen sinks and washbasins should be equipped with screen or strainers.

Table 3: Soak pits for greywater

Location	Soak pit(s) must be located more than 30 meters away from any borehole / surface well used by the host community, and from any water body, river, creek, stream, or drainage channel. Such pit(s) must be located in an area where soil excavation is possible. Rocky outcrops are not proper locations for soak pits.
Construction	Digging a pit at least 100 centimeters deep; ideally the bottom of the pit / trench is 3 meters or more above the groundwater level. Make sure that the bottom of the pit is not wet or damp before using it; if the bottom remains wet, this may indicate that the water table is high, and an alternative location must be found. Keeping excavated soil aside to backfill the pit after use. Ideally cover the pit to minimize mosquito breeding and odor generation.
Other considerations	The same soak pit(s) may be used to collect greywater from showers and from kitchens, when sized appropriately.

When leaving the area, or when a soak pit fills up to 50 centimeters from the ground surface, properly close the pit by:

- Properly backfilling the pit with the excavated soil.
- As much as possible, compacting the backfill area, using mechanical means or manually.

1.5 Existing locally available water and sanitation facilities

In specific circumstances, using locally available water and sanitation (WASH) facilities may be considered by commanding officers. Proper WASH facilities are generally those operated by governmental agencies, UN Agencies (e.g., IOM, UNHCR, WFP, UNICEF), international non-government organizations (ex. Red Cross, Médecins Sans Frontières) or governmental managed facilities (e.g., schools). Such facilities may also be available in camps that were used by the UN in the past, or those used on a seasonal basis.

Local WASH facilities may be considered proper for use by UN formed units during temporary deployments when they meet the following specifications:

- No visible untreated wastewater discharge or leakage.
- Provide hygienic separation between the user and the excreta.
- Well-maintained and safe.
- Hand washing point available in the vicinity.
- Integrate gender considerations (separate facilities for female users).

Before using such facilities, commanding officers must seek approval from the relevant authorities and ensure that the use of the local facilities by the troops will not prevent their use by the regular users (e.g., schools, refugee camps, local communities, etc.), and that there is no simultaneous use of the facilities by the community users and the uniformed personnel.

2. Solid waste management

Two types of solid waste material may be generated in temporary deployment settings:

a. domestic waste; and

b. hazardous waste, including biomedical waste.

Both types of solid waste material must be managed properly to reduce risks to human health, both for the personnel and the host community, and to reduce the impacts on the local environment. Practices aimed at preventing or minimizing the contamination of soil from fuel and lubricants are detailed at section 8.

2.1 Hazardous waste

Biomedical waste, expired medicine, and all hazardous waste (used petroleum, oil, and lubricants – POL – waste oil containers, batteries, used oil filters, oily rags, electronic equipment, etc.) must be segregated from the general solid waste stream. They must be transported back to the unit home base or the nearest main or permanent operating base, after being properly packaged for safe transportation. Commanding officers can take advantage of troop rotation / resupply activities to transport hazardous waste back to the home base. Such hazardous waste shall not be disposed of locally during temporary deployment activities.

Waste fuel, lubricants, petroleum products and other chemicals shall:

- Never be openly burnt in temporary burning pit or otherwise.
- Never be buried on site.
- Never be discharged in water bodies or drainage channels.

2.2 Recyclables

Unless the local disposal site offers formal and government approved recycling services, recyclable solid waste (plastic bottles, aluminum and tin cans, glass containers, juice and milk cartons, carboard, paper) should be segregated at the source and packaged properly for transportation back to the unit home base, or nearest main or permanent operating base. In case of space limitation on transportation vehicles, priority should be given to taking back plastic bottles and aluminum / tin cans to the home base.

2.3 Domestic waste

Four main options are available for commanding officers to ensure the safe and responsible management of domestic waste during temporary deployments:

- Take all solid waste back to the unit home base or other UN main or permanent operating base.
- Dispose of domestic waste using portable barrel incinerators (with air induction system only).
- Dispose of domestic waste at the local landfill.
- Dispose of domestic waste on site.

Taking all solid waste back to the home base (or other UN main or permanent operating base) and disposing of domestic waste using portable barrel incinerators (air-induced only) are considered the preferred methods and should be prioritized by commanding officers whenever possible. Still, disposing of domestic waste on site or using the local landfill may be acceptable, when implementing the practices detailed below.

2.3.1 Take all solid waste back to the unit home base or other UN main or permanent operating base

Collecting all solid waste and bringing them back to the unit home base or nearest main or permanent operating base for proper disposal as per normal procedures, while minimizing food waste, is the best method to reduce the environmental footprint of the unit when operating outside UN premises. Whenever possible, taking all solid waste to the home base should be prioritized by commanding officers. This option is best suited for short duration deployment lasting up to 5 days.

2.3.2 Dispose of domestic waste using air-induced portable barrel incinerators

Domestic waste can be safely disposed of using portable barrel incinerators with air induction systems. These portable incinerators are generally UN-owned equipment that can be provided to the formed unit by the mission support division. The figure 2 presents the air-induced portable barrel incinerator available through UN Global Systems Contract 4700019173 (PD/C0135/20).

Figure 2. Air-induced portable barrel incinerator

Air-induced portable barrel incinerator(s) may be used in conjunction with composting pits for the on-site disposal of organic waste, as detailed at Table 4.

Only air-induced barrel incinerators may be used in temporary deployment. Air-induced incinerators can reach the high-temperature level required to safely dispose of non-hazardous solid waste (> 500 °C, which will produce an efficient combustion with minimal emissions), due to the forcing of air by an electric motor. Incinerator ash can be disposed of within the temporary deployment camp by digging a hole at least 50 centimeters deep and mixing the ash, once cooled, with the excavated soil.

Low temperature open burning of domestic waste in make-shift drums is not an acceptable practice during temporary deployments.

2.3.3 Dispose of domestic waste in a local landfill

When a proper governmental authorized waste disposal site is available in the area of deployment, it may be advantageous to locally dispose of the domestic waste to such a disposal site. Doing so allows to minimize the amount of solid waste to be returned to the unit home base (or other UN main or permanent operating base) for proper disposal. Before using such facilities, commanding officers must seek approval by the relevant authorities.

After segregation, non-recyclable and non-hazardous domestic waste may be transported to an existing governmental authorized waste disposal site. Proper waste disposal sites are generally those operated by governmental agencies, UN Agencies (e.g., IOM, UNHCR, WFP, UNICEF), international non-government organizations (ex. Red Cross, Médecins Sans Frontières) or governmental built facilities, where access is controlled (i.e., entrance gate, secured perimeter, fenced). **Only government authorized waste and access-controlled disposal site may be used to dispose of domestic waste.**

An open area where free dumping of waste takes place without proper management and no access control is not considered as a proper facility and commanding officers shall not allow the use of such site for domestic waste disposal.

2.3.4 Dispose of domestic waste on-site

In situation where it is not practical to return all solid waste material to the home base (for example when the duration of the mobile deployment or temporary operating base is extended), where air-induced barrel incinerators are not available, and where there is no proper and/or government authorized disposal site in the area of deployment, it is possible to dispose of the domestic waste within the temporary deployment camp, provided that the practices detailed below are implemented. This portion of the solid waste stream is composed of organic and combustible non-hazardous waste. Hazardous waste must be returned to the home base as stated above in all circumstances.

Composting organic waste, including food waste

Organic waste includes food waste, vegetation debris and garden waste. As organic waste is biodegradable, they may be disposed of in the area of deployment by building a composting pit as detailed at Table 4.

Table 4: Composting pit for organic waste, including food waste

Location	Composting pit(s) should ideally be located more than 30 m away from the unit sleeping quarters, field kitchens and dining areas, when the required space is available. Such pit(s) must be located in an area where soil excavation is possible. Rocky outcrops are not proper locations for composting pits.
Construction	Digging a pit at least 1,5 m deep, and large enough to contain the amount of organic waste expected to be generated during the deployment. Keeping the excavated soil aside for backfilling prior to closure of the pit.
Other considerations	The following steps should be considered every time the pit is loaded: Segregate and dispose of food waste and greens in the composting pit every day (ideally after each meal).

	Add water when available. Keeping the pile moist will accelerate the composting process. Provide aeration mechanically (if available) or manually, by tilting the upper layers of the pile or pinching the content every time materials are added. Add a layer of soil. Secure the pit and cover it to avoid attracting vermin and minimize odor nuisance. Remove the cover only when adding additional food waste.

When leaving the area, or when the compositing pit fills up to 50 centimeters from the ground surface, properly remediate the pit by:

- Properly backfilling the pit with the excavated soil.
- As much as possible, compacting the backfill area, using mechanical means or manually.

Disposal of non-hazardous combustible material

Combustible non-hazardous material includes paper, cardboard, untreated wood, and dried-up vegetation may be safely disposed with an air-induced portable barrel incinerator. In the absence of such incinerator, combustible non-hazardous material may be disposed of in a temporary burning pit located and constructed as detailed at Table 5.

Burning of any plastic or rubber material shall be prohibited by commanding officers as they generate toxic fumes when improperly burnt. All plastic bottles and containers, or rubber material should be segregated, collected and either disposed of in a locally available government approved disposal site or returned to the home-base (or other UN main or permanent base) for proper disposal.

Table 5: Temporary burning pit for combustible non-hazardous waste

Location	Temporary burning pit(s) should ideally be located more than 30 m away the unit sleeping quarters, field kitchens and dining areas, and more than 100 m from community dwellings, taking prevailing wind direction in consideration.
Construction	Digging a pit or a trench at least 1,5 m deep Keeping excavated soil aside from remediation
Other considerations	Safely set fire to combustible non-hazardous waste using a small amount of diesel, or other flammable liquid. Monitor the fire to ensure that it does not spread out of the burning pit, and always put the fire out before sunset, using the excavated soil to cover the burnt waste and residual ash.

When leaving the area, properly remediate the temporary burning pit by:

- Properly backfilling the pit with the excavated soil.

As much as possible, compacting the backfill area, using mechanical means or manually.

3. Fuel and chemical spill prevention

Typical activities such as vehicle and generator refueling and maintenance activities, food cooking using diesel or jet fuel, and fuel / POL storage are some of the activities that may cause fuel, oil or chemical spills if not managed properly.

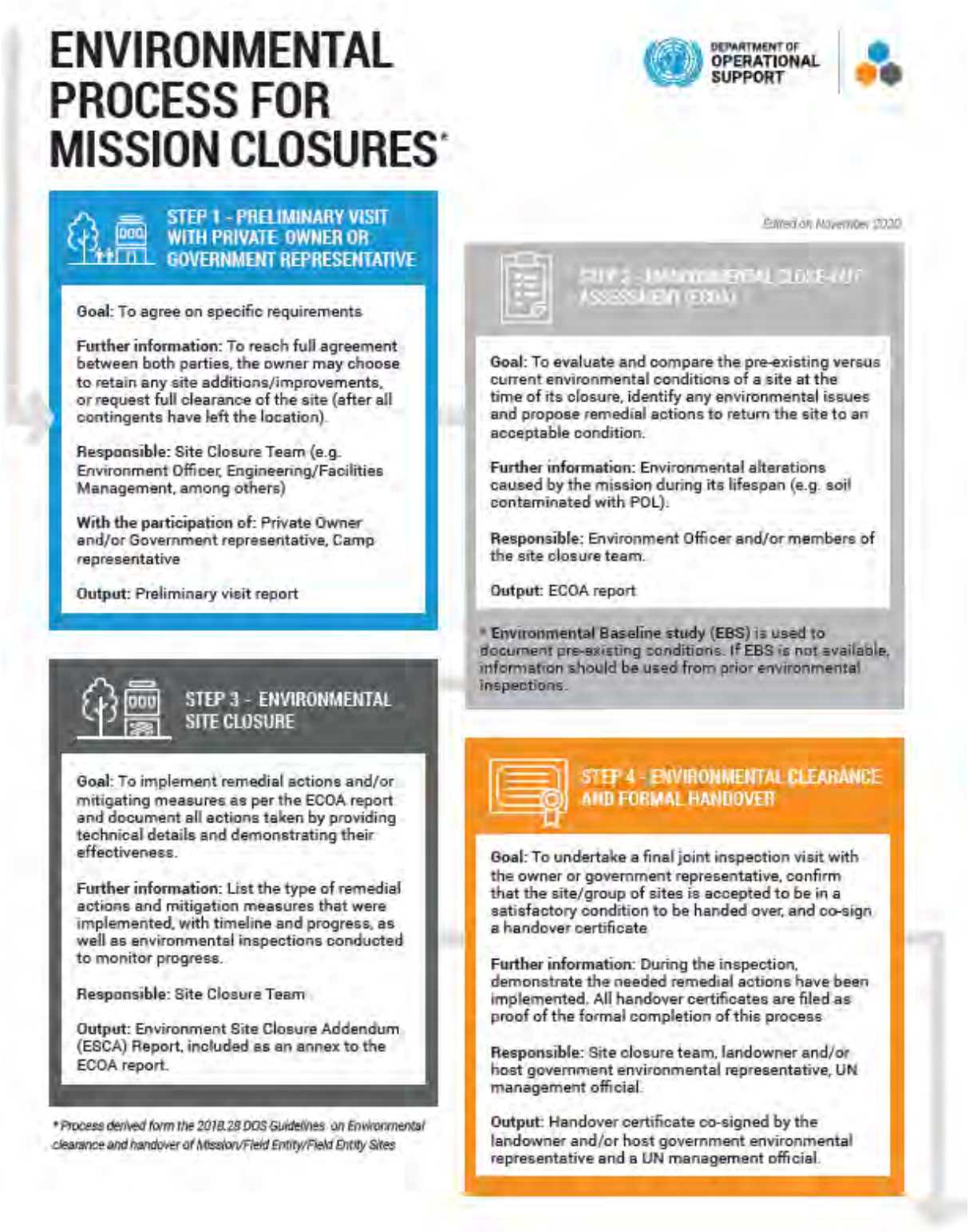
To avoid soil and water pollution, and the generation of oily water resulting from spills and leakages, simple prevention measures may be implemented by commanding officers during temporary deployment activities, as detailed at Table 6.

Table 6: Spill prevention

Fuel and POL storage	Locate fuel / POL storage areas at least 30 m from open water and drainage channels. Store fuel / POL drums and containers in a spill retention basin or on an impermeable tarp as shown at figure 3, raising berms on all sides using locally available soil material. Store fuel / POL drums upright. Protect fuel / POL drums from the Sun and rain using a tarp, a temporary shelter or by storing them in a sea container
Oil changes – vehicles and generators	Contain and collect drained used oil when conducting maintenance and repair of vehicles and generators. Safely store collected used oil and return it to the home base (or other UN main or permanent base) Collect oily rags, contaminated absorbent material, and drained oil filters. Safely store collected oily rags and contaminated absorbent material and return them to the home base with extreme caution – these may represent a fire hazard – if available, a portable barrel incinerator (air-induced only) may be used to safely dispose of oily rags and absorbent material. **Excavate and properly stored in waterproof bags contaminated soil and take them bags to home base**
Car washing bay	Hand-wash vehicles instead of using running water

Figure 3. Portable spill retention equipment

Annex J - Environmental Process for Mission (and Site) Closures (Infographic)



Annex K - Abbreviations

2IC/XO	second-in-command/Executive Officer
AAR	After Action Reviews
AAST	All Arms Search Team
AO	Area of Operations
APCs	Armored Personnel Carriers
C2	Command and Control
CASEVAC	Casualty Evacuation
CBRN	Chemical, Biological, Radiological and Nuclear
C-IED	Counter Improvised Explosive Device
CIMIC	Civil Military Cooperation
CMD	Conventional Munition Disposal
CMOV	Counter-Mobility
CMS	Chief of Mission Support
COE	Contingent Owned Equipment
COP	Common Operating Picture
CREW	Counter Radio-controlled Electronic Warfare
CSDM	Chief Service Delivery Management
DMS	Director of Mission Support
DOS	Department of Operational Support
DPO	Department of Peace Operations
ECM	Electronic Countermeasures
EO	Explosive Ordnance
EOD	Explosive Ordnance Disposal
EODC	EOD Cell
EOT	Earth observation technology
EP	Environmental Protection
ERW	Explosive Remnants of War
EW	Electronic Warfare
FC	Force Commander
FCOS	Force Chief of Staff
FHQ	Force Headquarter
FOM	Freedom of Movement
FP	Force Protection
FP	Force Protection
FRIM	Field Remote Infrastructure Monitoring
FTS	Field Technology Sections

GIS	Geographic Information System
GPR	Ground Penetrating Radar
GSC	Global Service Centre
HAZMAT	Hazardous Materials
HET	Heavy Equipment Transport
HN	Host Nation
HOM	Head of Mission
HOMC	Head of Military Component
HR	Human Resources
IED	Improvised Explosive Device
IED TM	Improvised Explosive Device Threat Mitigation
IED TM WG	IED Threat Mitigation Working Group
IEDD	Improvised Explosive Device Disposal
IFMT	Integrated Force Mobility Team
IMAS	International Mine Action Standards
IMTCs	Integrated Mission Training Centers
IOs	International Organizations
ISR	Intelligence Surveillance and Reconnaissance
JETF	Joint Engineer Task Force
LD	Logistics Division
LO	Liaison Officer
LOA	Letter of Assist
LOC	Lines of Communications
MA	Mission Area
MEDEVAC	Medical Evacuation
MHE	Material Handling Equipment
MILENG	Military Engineers / Military Engineering
MLT	Mission Leadership Team
MOU	Memorandum of Understanding
MOV	Mobility
MSR	Main Supply Route
MUAS	Micro Unmanned Aerial Systems
NGOs	Non-Governmental Organizations
NSE	National Support Element
OICT	Office of Information and Communications Technology
OMA	Office of Military Affairs
OSCM	Office of Supply Chain Management
PDV	Pre-deployment Visit(s)

PIO	Public Information Officer
POC	Protection of Civilians
POL	Petrol, Oil and Lubricant
QIP	Quick Impact Projects
QRF	Quick Reaction Force
RC/HC	Resident/Humanitarian Coordinator
RCIED	Radio / Remote Controlled Improvised Explosive Device
RCP	Route Clearance Package
ROE	Rules Of Engagement
SCPMT	Smart Camp Project Management Team
SDGs	Sustainable Development Goals
SEA	Sexual Exploitations and Abuse
SGITT	Service for Geospatial, Information, and Telecommunications Technologies
SHQ	Sector Headquarter
SLT	Senior Leadership Team
SNCO	Senior Non-Commissioned Officer
SO	Staff Officer
SOFA	Status of Forces Agreement
SOP	Standard Operating Procedure
SST	Specialized Search Team
STM	Specialized Training Material
SUR	Statement of Unit Requirements
SURV	Survivability
TCC	Troop Contributing Country(s)
TCCs	Troop Contributing Countries
TCRCP	Temporary Composite Route Clearance Packages
TLM	Topographic Line Mapping
TOB	Temporary Operating Bases
TTP	Tactics, Techniques and Procedures
TTPs	Tactics, Techniques and Procedures
U-1/G-1	Personnel Branch (FHQ/SHQ)
U-2/G-2	Intelligence Branch (FHQ/SHQ)
U-3/G-3	Operations Branch (FHQ/SHQ)
U-4/G-4	Logistic Branch (FHQ/SHQ)
U-5/G-5	Planning Branch (FHQ/SHQ)
U-6/G-6	Communication and Information Systems Brach (FHQ/SHQ)
U-7/G-7	Training and Education Branch (FHQ/SHQ)
U-8/G-8	(Military) Engineer Branch (FHQ/SHQ)

U-9/G-9	CIMIC Branch (FHQ/SHQ)
UN	United Nations
UN CT	UN Country Team
UN OCHA	UN Office for the Coordination of Humanitarian Affairs
UNDP	UN Development Program
UNGIS	UN Geospatial Information Section
UNHCR	UN High Commissioner for Refugees
UNIBAM	UN Infantry Battalion Manual
UNOE	United Nations Owned Equipment
UNOE	UN-Owned Equipment
UXO	Unexploded Explosive Ordnance
VAs	Vulnerable Areas
VPs	Vulnerable Points
WAH	Working at Heights
WG	Working Group
WICS	Working in Confined Spaces