SURVIVABILITY_OPERATIONS
Chapter 2

Integration of Survivability Operations

Competing demands and limited resources for conducting survivability operations will be a predominant factor in the operational environment. Careful planning, prioritization, and allocation of those resources must occur to accomplish objectives. This chapter centers on planning, preparing, executing, and assessing survivability operations. The construct of essential tasks for mobility, countermobility, and/or survivability (M/CM/S); and inclusion in the running estimate are highlighted to assist planners in integrating survivability operations.

ROLES AND RESPONSIBILITIES

2-1. Roles and responsibilities for integrating survivability operations may vary based on the organization of functional and integrating cells at different echelons, and should be prescribed in unit SOPs. This section presents guidelines for roles and responsibilities for survivability operations at the brigade/MAGTF level and below.

COMMANDER

2-2. The challenging and unpredictable nature of operational environments requires that commanders at every echelon thoroughly understand survivability requirements and issue clear intent, guidance, and prioritization for any survivability operations conducted by or in support of their unit.

The commander uses the construct of essential tasks for M/CM/S to prioritize actions and concentrate survivability efforts. Commanders must understand their survivability requirements across the range of military operations and the capabilities of available assets to perform survivability opera-

美陸軍戰場生存力教範
第二章

戰場生存力整合作業

在作戰環境中影響戰場生存力作業執行之主要因素為需求競爭及資源有限，詳細計畫、律定優序及配置相關資源，必須以達成任務為導向。本章重點在計畫、準備、執行及戰場生存力作業之評估。構思必要之機動、反機動及戰場生存力作業，並包含在持續判斷中聚焦於協助計畫人員針對戰場生存力作業實施整合。

權責劃分

2-1 戰場生存力作業的權責劃分會隨不同層級的組織功能及組織整合狀況實施調整並應預先律定於單位標準作業程序內，此段落所呈現之指導為針對旅(陸戰隊陸空特遣隊)以下階層之戰場生存力作業權責進行說明。

指揮官權責

2-2 戰場環境之挑戰及不可預測的特性需要各階層指揮官徹底了解部隊所需之戰場生存力及對任何實施及支援執行戰場生存力作業的單位，下達清晰的企圖、指導及優序。

指揮官構思必要之機動、反機動及戰場生存力作業以律定行動之優序並集中運用構築戰場生存力所需兵力，指揮官必須同時了解軍事行動中之戰場生存力需求及作戰地區內可獲取資材執行戰場生存力作

tions within the AO. The commander provides focus through the essential tasks for survivability during planning and preparation, enforces safety and construction standards during execution, and continuously assesses the effectiveness of survivability against expected threats.

2-3. In addition to the responsibilities shared by all commanders, engineer commanders at every echelon must also completely understand the capabilities and requirements of the supported unit and understand how best to integrate engineers as part of combined arms operations. The engineer commander ensures that survivability missions are properly planned, designed, and constructed to standard. The engineer commander works together with the appropriate engineer staff officer to ensure that the survivability effort is synchronized and meets the needs of the supported unit.

ENGINEER STAFF OFFICER

2-4. The engineer staff officer is a special staff officer and is typically the senior engineer officer on staff. The engineer staff officer is responsible for coordinating engineer assets and operations for the BCT/regimental combat team (RCT) (including engineer support to survivability operations) and—

- Advises the commander on engineer assets and capabilities.
- Makes recommendations on the priority of engineer effort based on the commander’ s guidance.
- Develops recommended essential tasks for M/CM/S.
- Makes recommendations on engineer task organization and determines if additional assets are needed to execute the anticipated engineer tasks.
- Integrates survivability guidance and tasks into mission orders and monitors execution.

業的能力。指揮官針對必要之戰場生存力作業的計畫與準備、構築執行安全與構築標準及持續評估部隊之戰場生存能力對預期威脅抵抗效能等作業中提供重點。

2-3 除了所有指揮官所分擔的責任外，在各層級部隊之工兵指揮官必須全然了解受支援單位所需作業能力及需求並了解如何最佳將工兵部隊整合為聯合兵種作戰的一部分。工兵指揮官確保所執行之戰場生存力任務為經過適切計畫、設計及符合構築標準的。工兵指揮官與戰鬥部隊合適之工兵參謀共同作業以確保執行戰場生存力之兵力能同步且符合支援單位需求。

工兵參謀權責

2-4 工兵參謀官為特業參謀且通常為資深的工兵軍官，工兵參謀官負責對旅級戰鬥隊/團級戰鬥隊(包含工兵支援戰場生存作業)協調工兵資材與相關作業及下列事項：

- 給予指揮官相關所需工兵部隊之能力及資材建議。
- 依指揮官指導完成工兵兵力運用優序建議。
- 依據建議之必要任務，發展相關之機動、反機動及戰場生存力作業。
- 建議工兵之任務編組及決定針對預定所需執行工兵任務是否需要額外資材。
- 將戰場生存力指導及任務整合至任務命令中及督導執行。

OTHER STAFF OFFICERS

2-5. The operations staff officer (S-3) is the coordinating staff officer for all matters concerning tactical operations. In the BCT, the S-3 supervises the protection cell. The S-3 integrates and synchronizes survivability efforts within the scheme of movement and maneuver/scheme of maneuver based on recommendations from the engineer staff officer. The CBRN officer and the provost marshal are typically major contributors to the planning and resourcing of survivability operations.

2-6. The intelligence staff officer (S-2) provides information on enemy capabilities and expected enemy courses of action (COAs), to allow the engineer planner to plan and recommend the type and amount of survivability positions needed to protect friendly forces.

2-7. The logistics staff officer (S-4) is responsible for planning and executing logistical requirements for operations. This includes the delivery of fuel, construction and barrier material, and ammunition. The S-4 coordinates for the establishment of logistics sites and materials issued to forward units based on the mission. Survivability missions are often very resource intensive. Early coordination with the S-4 is essential to ensure that adequate types and quantities of materials and transportation assets are available to support the mission.

2-8. Depending on the situation, other staff officers may also play a role in integrating survivability operations. For example, the CBRN officer and the surgeon coordinate Army health system support requirements for CBRN operations, some of which may involve survivability operations. Since survivability operations (and their resulting positions and structures) may involve significant safety risk, the safety officer advises and assists with risk management and compliance with safety requirements.

PROTECTION CELL

其他參謀權責

2-5 作戰官(參三)為負責協調有關戰術行動各項事務之參謀，在旅級戰鬥隊中，參三監督防護小組，參三依據工兵參謀所提供之建議針對任務所需之運輸、部隊機動及作戰行動，整合與同步戰場生存力作業兵力。化生放核參謀官及憲兵官通常主要為戰場生存力作業之計畫及資源之撰擬者。

2-6 情報參謀官(參二)提供敵軍能力及預期之敵可能行動使工兵計畫人員可針對友軍部隊所需之防護，實施計畫及建議戰場生存力陣地之型式及數量。

2-7 後勤參謀官(參四)負責計畫及執行作戰所需之後勤需求，這包含對燃油、建材、阻材及彈藥。參四負責依任務協調補給點建立及向前方單位發送物資。執行戰場生存力任務通常需要非常密集的資源，必須與參四實施先期協調，以確保能獲得數量足夠之各類型材料及運輸工具，以支援任務執行。

2-8 其他參謀依實際狀況，可能也會負責實施戰場生存力作業整合。舉例而言，化生放核官與軍醫官協調陸軍健康系統以支援化生放核作業所需能量，其中部分作業可能涉及戰場生存力作業(及其最終之位置與結構)可能涉及重大的安全風險，安全軍官建議並協助實施風險管理，以符合安全要求。

2-9. The protection cell integrates and synchronizes protection tasks and their associated systems (see FM 3-37) throughout the operations process. The risk management process (see FM 5-19) is the overarching process for integrating protection into Army operations. The protection cell coordinates with the mission command cell to facilitate the information protection task. In the BCT, the S-3 supervises the protection cell.

防護小組

2-9 防護小組於作戰全程整合防護任務，使各防護任務同步化，並使系統相互連結。風險管理流程為將防護整合至陸軍作戰中之首要流程。防護小組與任務指揮小組協調，以促進資訊防護任務，在旅級戰鬥隊中，參三負責監督防護小組。

2-10. Protection integration in the BCT/RCT may require commanders to designate a staff lead, as the protection officer, who has the experience to integrate risk management and other integrating processes. The executive officer, S-3, or a senior noncommissioned officer (NCO) (Army)/senior staff NCO (Marine Corps) could accomplish these duties. Assistant operations officers and other staff officers could be designated as the protection coordinators to facilitate the integration of the protection tasks into operations. In all cases, protection officers and coordinators work with higher and lower echelons to nest protection activities with complementary and reinforcing capabilities

2-10 於旅級與群級戰鬥隊中防護力整合可能需由指揮官指派有風險管理整合或其他整合流程經驗之參謀作為防護力整合官，負責領導防護力整合作業。執行官、參三獲一個資深士官擔負這些責任，助理作戰官及其他參謀可指派為防護力協調人員以促進防護力任務可與作戰實施整合。在所有案例中，防護力軍官及協調人員與上下級實施作業，以運用補充及強化能力將防護力實施套疊。

PLANNING

2-11. Planning survivability operations is supported by the construct of the engineer's running estimate during the planning process described in FM 5-0 and MCWP 5-1. As part of the combined arms team conducting the planning process, engineers and other planners focus their efforts on specific considerations for survivability for each step of the process (see table 2-1).

計畫

2-11 戰場生存力作業計畫需由工兵在計畫全程的持續判斷概念提供支援，支援方式以在 FM5-0 及 MCWP5-1 等手冊內描述。如同部分之聯合兵種小組執行計畫程序，工兵及其他計畫者聚焦於計畫全程中每一步驟因應戰場生存力所需特殊考慮事項之兵力運用。(參見表 2-1)

Table 2-1. Characteristics of individual fighting positions

Steps of the MDMP	Steps of the MCPP	Survivability Planning Considerations
Receipt of the Mission	Problem Framing	● Receive higher headquarters plans, orders, and annexes. ● Understand the unit's mission, concept of the operation, and commander's intent and priorities for survivability (two levels up). ● Understand the engineer mission, intent, and scheme of engineer operations (two levels up). ● Understand higher echelon's essential tasks for M/CM/S.
Mission Analysis		● Identify specified and implied tasks for survivability; develop recommended list of essential tasks for survivability (for the commander's approval during the mission analysis/problem framing brief). ● Initiate RFIs. ● Evaluate terrain, climate, and threat capabilities to determine the potential impact on survivability. ● Determine the availability of construction and other engineering materials. ● Review the availability of survivability capabilities to include Army/Marine Corps, joint, multinational, HN, and by contract. ● Determine protection requirements for supported force. ● Review existing data from reconnaissance or assessments. ● Determine the threat (to include environmental and EHs). ● Determine survivability related IRs (terrain and mobility restraints, threat capabilities, and critical infrastructure) and make recommendations for inclusion in the CCIR as necessary. ● Integrate survivability IRs into the R&S plan. ● Provide the commander with suggested guidance for survivability operations that can be included in the commander's guidance for COA development.
COA Development	COA Development	● Identify priority survivability requirements. Refine essential tasks for survivability (if necessary). ● Integrate survivability support into COA development and in the scheme of engineer operations for each COA. ● Array survivability assets using task and purpose. ● Recommend an appropriate level of protection effort for each COA based on the expected threat. ● Develop COA evaluation criteria focused on survivability efforts
COA Analysis	COA Analysis	● Refine the survivability plan based on results of wargaming.
COA Comparison	COA Comparison and Decision	● Provide advantages and disadvantages of each COA from the survivability perspective, such as: ability to support, risk to forces or equipment.
COA Approval		● Gain approval for any changes to the essential tasks of survivability. ● Gain approval for survivability priorities of effort and support. ● Gain approval for requests for engineer augmentation to be sent to higher headquarters.
Orders Production, Dissemination, and Transition	Orders Development	● Provide input to the appropriate plans and orders. ● Ensure that all engineer forces and critical equipment are properly allocated in the task organization.
	Transition	

Note.
The Army uses the military decisionmaking process (MDMP) and the Marine Corps uses the Marine Corps Planning Process (MCPP). The processes are similar, although the steps are different.
Legend:
CCIR – commander's critical information requirements
COA – course of action
EH – explosive hazard
HN – host nation
IR – information requirement
M/CM/S – mobility, countermobility, and/or survivability
R&S – reconnaissance and surveillance

表 2-1. 計畫作為程序中戰場生存力計畫考慮因素

軍事決策程序步驟	陸戰隊計畫程序步驟	戰場生存力計畫考慮因素
受領任務	界定問題	●接收上級計畫、命令及附件. ●了解單位任務、作戰構想及指揮官企圖與戰場生存力作業優序(上兩階層) ●了解工兵任務、企圖及工兵作戰計畫(上兩階層) ●了解更高層級部隊執行機動、反機動及戰場生存力之必要任務。
任務分析		●識別特定及推斷之戰場生存力任務，發展必要戰場生存力任務之建議清單(便於任務分析期間由指揮官核定/建構問題簡報) ●初步指揮官情報需求 ●地形、天氣及威脅能力評估以決定對戰場生存力之潛在衝擊。 ●決定可獲得之建築及其他工兵器材。 ●檢視包含透過本軍、聯戰、多國、敵國或契約可獲得之戰場生存能力。 ●決定受支援部隊之防護需求 ●檢視自偵蒐或評估得到之既有資訊。 ●決定威脅(包含環境及爆炸性危害) ●依據情報需求(地形、機動限制、威脅能力及關鍵基礎設施)判斷戰場生存力及對指揮官重要情資所需包含之必要資訊提出建議。 ●將戰場生存力資訊整合至監偵計畫。 ●可於指揮部隊行動方案發展下達指導時，提供指揮官針對行動方案發展之指導。
發展行動方案	發展行動方案	●識別戰場生存力需求優序，修訂必要之戰場生存力作業任務(視需要) ●將戰場生存力支援項目整合至行動方案發展中及各行動方案的工兵作戰計畫。 ●依據任務及目標，部署戰場生存力作業所需資材。 ●依據各行動方案預期威脅，建議適當層級之防護兵力運用。 ●發展聚焦於戰場生存力兵力運用之行動方案評估標準。
分析行動方案	分析行動方案	●依據兵棋推演結果修正戰場生存力計畫。
比較行動方案	行動方案比較及決策	●就戰場生存力部分提供各行動方案利弊，例如支援能力、執行部隊或裝備之風險。
核准行動方案		●取得對必須執行戰場生存力任務之任何變更之核准。 ●取得對執行戰場生存力作業之兵力及支援運用優序任何變更之核准。 ●取得呈報上級核准之工兵兵力增加需求。
命令產製分發及傳送	發展命令 傳送	●提供行動方案成果至適宜之計畫與命令中 ●確保所有工兵兵力及重要裝備均妥善配置於任務編組中。

備註
陸軍運用軍事決策程序(MDMP)及陸戰隊運用陸戰隊對計畫程序，兩者流程相似，雖然步驟不同。

圖例
CCIR –指揮官重要情報需求
COA –行動方案
EH – 爆炸性危害
HN – 敵國
IR – 情報需求
M/CM/S – 機動、反機動及戰場生存力。
R&S – 監偵作業
RFI –情報需求。

THE ENGINEER STAFF'S RUNNING ESTIMATE

2-12. The engineer staff's running estimate is a logical thought process and extension of the planning process. It is conducted by the engineer staff officer, concurrently with the planning process of the supported maneuver force, and is continuously maintained throughout planning, preparation, execution, and assessment. This running estimate allows for early integration and synchronization of essential tasks for M/CM/S into the planning process. It drives the coordination between the engineer, the supported commander, and other staff members in the development of engineer plans, orders, and annexes. Table 2-2 shows the relationship between mission analysis/problem framing during the planning process and the engineer's running estimate, including identification of essential tasks for M/CM/S.

2-13. The running estimate parallels the planning process. Mission analysis/problem framing, facts and assumptions, and analysis of the mission variables furnish the structure for running estimates. In the running estimate, the engineer staff continuously considers the effects of new information and updates the following:

- Facts.
- Assumptions.
- Friendly force status (assessment of M/CM/S capabilities to ongoing and planned operations).
- Enemy activities and capabilities (that can affect current operations and future plans).
- Civil considerations (effects on current engineer operations and future plans).
- Conclusions and recommendations.

2-14 The running estimate provides the

工兵參謀持續判斷

2-12 工兵參謀持續判斷為貫穿計畫全程並延伸計畫流程的一種思維，由工兵參謀官執行，與支援任務部隊之計畫程序同步進行，並整個計畫、準備、執行及評估作業之各階段持續執行。持續判斷可將必要之機動、反機動及戰場生存作業先期與計畫程序進行整合及同步。並促成工兵參謀與受支援部隊指揮官及針對其參謀發展工兵計畫、命令與附件之協調。表 2-2 顯示在計畫過程中，任務分析/界定問題與工兵持續判斷之關係並包含識別必要之機動、反機動及戰場生存力任務。

2-13 持續判斷與計畫程序同時執行，任務分析/問題界定，事實與假定及分析任務變動所提供執行持續判斷的架構，在持續判斷中，工兵參謀繼續考慮新獲得情資所產生之影響並更新下列事項：

- 事實。
- 假定。
- 友軍狀態(評估正在執行及計畫中作戰任務之機動/反機動/戰場生存能力)。
- 敵軍活動及能力(可能對現行作戰及未來計畫造成影響)。
- 民事考慮事項(對現行工兵作業及未來計畫之影響)。
- 結論與建議。

Table 2-2. Correlation of mission analysis/problem framing and the engineer's running estimate

Mission Analysis/Problem Framing	Engineer's Running Estimate
●Analyze the higher headquarters plan or order. ●Perform initial IPB. ●Determine specified, implied, and essential tasks. ●Review available assets and identify resource shortfalls. ●Determine constraints. ●Identify critical facts and develop assumptions. ●Begin risk management. ●Develop initial CCIRs and EEFIs. ●Develop initial R&S synchronization tools. ●Update the plan for the use of available time. ●Develop initial themes and messages. ●Develop a proposed problem statement. ●Develop a proposed mission statement. ●Present the mission analysis/problem framing briefing. ●Develop and issue the initial commander's intent. ● Develop and issue the initial planning guidance. ● Develop COA evaluation criteria. ● Issue a warning order.	●Analyze the higher headquarters orders, to include— ◆Commander's intent. ◆Mission. ◆Concept of operation. ◆Timeline. ◆AO. ●Conduct IPB, to include— ◆Terrain and weather analysis. ◆Enemy mission and M/CM/S capabilities. ◆Friendly mission and M/CM/S capabilities. ●Analyze the engineer mission, to include— ◆Specified M/CM/S tasks. ◆Implied M/CM/S tasks. ◆Assets available. ◆Limitations. ◆Risk as applied to engineer capabilities. ◆Time analysis. ◆Identified essential tasks for M/CM/S. ◆Restated mission. ●Conduct risk assessment, to include— ◆Safety. ◆Environment. ●Determine CCIR (terrain and mobility restraints, obstacle intelligence, threat engineer capabilities, and critical infrastructure). ●Integrate engineer reconnaissance effort.

Legend:
AO – area of operations
CCIR – commander's critical information requirement
COA – course of action
EEFI – essential elements of friendly information
IPB – intelligence preparation of the battlefield/battlespace
M/CM/S – mobility, countermobility, and/or survivability
R&S – reconnaissance and surveillance

表 2-2. 任務分析/界定問題與工兵持續判斷關係一覽表

任務分析/界定問題	工兵持續判斷
●分析上級計畫或命令 ●顯示初步戰場情報準備成果。 ●決定特定、推斷及關鍵任務 ●檢視可用資材及短缺資源。 ●決定限制因素。 ●識別重要因素並發展假定事項。 ●執行風險管理。 ●發展初步指揮官重要情資及友軍重要情資需求。 ●發展初步同步監偵手段。 ●修訂時間分配。 ●發展初步任務主軸及指示。 ●發展建議的問題敘述。 ●發展建議之任務敘述。 ●實施任務分析/界定問題簡報。 ●發展及下達初步指揮官企圖。 ●發展及下達初步指揮官計畫指導。 ●發展行動方案評估標準。 ●下達預備命令。	●分析上級命令，包含下列事項 ◆指揮官企圖 ◆任務 ◆作戰構想 ◆時程 ◆作戰地區 ●實施戰場情報準備，包含下列事項 ◆地形及天氣分析 ◆敵軍任務及機動/反機動及戰場生存能力分析 ◆友軍任務及機動/反機動及戰場生存能力分析 ●工兵任務分析，包含下列事項 ◆特定之機動/反機動及戰場生存力任務 ◆推斷之機動/反機動及戰場生存力任務 ◆可獲得資材 ◆限制因素 ◆關於工兵能力之風險 ◆時間分析 ◆識別必要之機動/反機動及戰場生存力任務 ◆重述任務 ●實施風險評估，包含下列事項 ◆安全 ◆環境 ●判斷指揮官情報需求(地形雨機動限制、障礙資訊、工兵能力威脅及重要的基礎設施) ●整合工兵偵察兵力

圖例:

AO –作戰地區

CCIR –指揮官重要情報需求

COA –行動方案

EEFI –友軍情資要項

IPB –戰場情報準備

M/CM/S – 機動、反機動及戰場生存

R&S – 偵察及監視

basis for action. When an estimate reveals a variance that requires correction, staff representatives act within their authority to correct it. When the decision required is outside their authority, they present the situation to the staff officer delegated the authority to act or to the commander. When the estimate reveals information that answers an information requirement, especially a commander's critical information requirement, engineer staff representatives send that information to the element requiring it. Engineer staff representatives do more than collect and store information; they process it into knowledge and apply judgment to get the knowledge to those requiring it.

ESSENTIAL TASKS FOR SURVIVABILITY

2-15. Increased engineer requirements in the operational environment may limit engineer resources immediately available to support survivability operations. Other engineer tasks are often in competition for the same engineer assets. Early integration and the establishment of priorities are essential to allocate resources and ensure adequate time for mission completion. The commander sets priorities to allow the force to perform the most critical tasks. Planners (typically elements such as engineer, CBRN, military police, or explosive ordnance disposal) assist the commander in his decision by providing recommended essential tasks for survivability during mission analysis/problem framing.

They develop the recommended essential tasks for survivability in conjunction with the staff's development of the critical asset list and the defended asset list and as part of EA development and combined arms obstacle planning. (For information about the critical asset list and defended asset list see FM 3-37. For information about EA development and combined arms obstacle planning see FM 90-7.) After the essential tasks for survivability are approved, the en-

2-14 持續判斷提供行動之基礎，當持續判斷顯示需要修正的差異時，參謀會在權責內完成修正。當所需決定事項超出參謀權責時，他們會將這個狀況呈報給經授權之參謀軍官去執行或呈報給指揮官。當持續判斷顯示之資訊符合情報需求時，特別針對指揮官重要情報需求，工兵參謀代表將分送情資至所需單位。工兵參謀作業不僅為蒐集及存處情資；他們處理相關情資使其轉化為知識且運用判斷取得相關知識，以供給所需之單位。

戰場生存力必要執行任務

2-15 作戰環境中對工兵需求的增加可能立即對可用於支援戰場生存力作業造成限制，其他工兵任務通常對相同的工兵資產產生競爭。對於資源配置及確保有足夠的時間可以完成任務而言，提早整合及建立優序是必要的。指揮官設定優序可使部隊執行最關鍵的任務。計畫人員(通常的成員例如工兵、化生放核、憲兵或未爆彈處理)在任務分析/問題界定時，藉由提供必要的戰場生存力任務建議，以協助指揮官下達決心。

計畫人員發展必要戰場生存力任務建議與參謀發展之重要資材清單及防禦資材清單連結，均為接戰地區發展及聯合障礙物設置計畫的一部分。(針對重要資材清單及防禦資材清單請參閱 FM3-37，針對接戰地區發展及聯合障礙物設置計畫請

gineer staff officer and other planners integrate them into COA development. They develop associated methods to complete the essential tasks for survivability by assigning resources and recommending priorities.

The engineer staff officer and other planners, in coordination with the maneuver planner, then synchronize the methods to achieve the desired effects on enemy or friendly forces. A fully developed essential task for survivability includes the task and the purpose, described as follows:

●Task.

A task is a measurable action performed by individuals or organizations. These are the most important survivability tasks which must be accomplished. Often the entire operation is dependent on completing these tasks, and without their successful completion, the operation is at risk.

●Purpose.

The purpose is the desired or intended result of the task stated in terms relating to the purpose of the supported unit. This portion of the essential task for survivability explains why it must be accomplished. It also provides intent to the engineer commander so that he can react as the situation changes.

2-16. The commander uses essential tasks for survivability to communicate to subordinate units what he wants accomplished with available assets to perform survivability tasks. This provides the unit with clear priorities and unity of purpose in planning, preparing, and executing. Essential tasks for survivability also provide nonengineer elements clearly articulated tasks related to survivability. Example engineer-related essential tasks for survivability might include—

參閱 FM90-7)，在必要之戰場生存力任務核准後，工兵參謀官及其他計畫人員將其整合至行動方案發展中。他們以指定資源及建議優序的手段，發展相關的方式以完成必要的戰場生存力任務。

工兵參謀官及其他計畫人員與主任務計畫人員共同協調，然後同步這些方法以達成對敵、我軍部隊預期之影響。完整發展之戰場生存力任務包含任務及目的，敘述方式如下:

●任務

任務為由個人或組織執行具可衡量的行動。這些最重要戰場生存力任務必須被完成，通常整體作戰執行均仰賴這些必須完成的任務，若無法成功完成修關戰場生存力任務，將使作戰產生相關風險。

●目的

目的為用於說明任務需要或企圖得到之結果及與受支援單位相關之目的，針對戰場生存力任務部分則原說明為何此項作業必須完成，這同樣提供工兵指揮官企圖，使其能因應狀況改變作出反應。

2-16 指揮官運用律定必要執行之戰場生存力，與下級溝通他希望完成的戰場生存力任務及所需資材，這提供單位清楚的優序及連結計畫、準備及執行的目的，針對必要執行任務同樣可提供非工兵單位清楚的與將任務與戰場生存力連結。舉例而言，與工兵相關必要的戰場生存力任務可能包含-

●Essential task for M/CM/S #1.

■Task:Construct primary and supplementary fighting positions for all vehicles and crew-served weapons at BP Patriots.

■Purpose:To provide Alpha Company with effective cover and concealment from direct and indirect fire during their defense of Task Force England’s western flank.

● Essential task for M/CM/S #2.

■ Task:Construct revetments and berms around the bulk fuel site at forward operating base Bears.

■Purpose: To provide effective cover from direct and (near miss) indirect fire for 1st Brigade’s fuel supply.

PREPARATION

2-17. Preparing to execute survivability operations begins as relevant information and guidance are developed during the planning phase. The early identification of the essential tasks for survivability during planning initiates the requisitioning and transportation of survivability materials (such as soil-filled containers, concrete barriers, and construction materials) and prompts any requests for unit augmentation. The use of warning orders and planning in parallel facilitates early coordination between engineer and supported units, the pre-positioning of equipment and materials, and the preliminary design work for survivability positions.

2-18. Based on the task organization, survivability guidance, the identification of critical assets (such as command and control nodes and air defense systems), and locations of unit positions; subordinate engineers begin coordinating survivability efforts with supported units. Early initiation of troop movements and the pre-positioning of survivability assets and materials within the AO enable the timely execution of survivability operations.

2-19. Certain survivability measures, such as protective positions and facility

●針對機動/反機/戰場生存力之必要執行項目(編號 1)

■任務:在代號愛國者戰鬥據點所有的車輛及多人操作武器構築主要且輔助戰鬥陣地。

■目的:提供 A 連在擔任代號英格蘭特遣隊西側翼防禦期間對直射及曲射武器有效的隱掩蔽。

●針對機動/反機/戰場生存力之必要執行項目(編號 2)

■任務:於代號 BEARS 的前進作業基地的油料儲放點四周構築護坡及護堤。

■目的:提供第 1 旅油料補給點對直射及非直射武器(近彈)之掩蔽。

準備

2-17 執行戰場生存力作業之準備工作在計畫階段發展相關資訊及指導時即開始進行。在對戰場生存作業所需材料之申請與運輸開始計畫階段，先期對必要之戰場生存力任務完成確認(例如需填土容器、混凝土障礙及建材)及任何對任務編組的提示。同步運用預備命令及計畫可幫助工兵與受支援單位針對預置的裝備、材料及針對戰場生存力陣地初步設計先期完成協調。

2-18 依據任務編組、戰場生存力指導、關鍵資材識別(例如指管節點及防空是系統)及單位陣地位置；下級工兵部隊開始與受支援單位協調戰場生存力所需兵力。先期啟動部隊調動、及在作戰地區內預置戰場生存力作業資材資材可使戰場生存力作業即時執行。

2-19 某些戰場生存力作業例如防護性陣地及設施強化，可能需要大量的設計兵力。工兵負責與受支援單位協調、主導偵察、評估及發展設計作業。設計應通過驗證以確

hardening, may require significant design efforts. Engineers coordinate with the supported unit, conduct reconnaissance and assessments, and develop designs. Designs are verified to ensure that they defeat the specified threat, meet safety requirements, and that bills of material are correct. Tele-engineering and other reachback capabilities (see appendix B) can aid designing efforts. Basic survivability design concerns are discussed in chapter 3.

保可對抗特定威脅、符合安全需求且可列述正確材料清單。電訊技術及其他後申取訊能力(參考附件 B)可加強設計能力。基本的戰場生存力有關設計在第三章內實施討論。

2-20. During preparation, the engineer's running estimate continues to track resource status. Priority for assessment is on answering priority intelligence requirements and friendly forces information requirements that fall within the engineer's area of expertise. Assessing during preparation also includes confirming or disproving any assumptions that were made during planning.

2-20 在準備階段，工兵持續執行持續判斷以追蹤資源狀況，優序評估的作用為就工兵專業領域回應情報優先需求及友軍情報需求，在準備階段的評估同樣包含確認或是否決在計畫階段已做出的任何假定事項。

EXECUTION

2-21. Survivability missions should begin as soon as possible (sometimes even before completion of the supported unit's planning) to maximize the amount of survivability support that can be provided. Execution involves monitoring the situation, assessing the operation, and adjusting the order as needed. Fighting and protective positions are constructed, facilities are hardened, and camouflage and concealment measures are implemented. Units track the completion of missions and reallocate resources as the situation requires. Quality assurance and quality control are implemented to ensure that survivability efforts meet the commander's intent and also meet proper design and construction standards to ensure safety.

執行

2-21 戰場生存力任務應盡速開始(有時甚至在受支援單位完成計畫前)以最大化的提供戰場生存力作業量。執行階段包含監控狀況、評估作業及依需求調整命令。構築戰鬥及防護陣地、強化設施強度與實施隱掩蔽作為。各單位掌握任務完成進度及依狀況需求重新配置資源。執行品保及品管除能確保戰場生存力作業符合指揮官需求外同樣也能達到適當的設計與構築標以確保安全。

2-22. During execution, the engineer's running estimate focuses on identifying any variances, assessing their effect on achieving the end state, and recommending corrective actions to keep the operation within the commander's intent. Assessments also address the supportability of possible sequels and future operations.

2-22 在執行期間，工兵持續判斷聚焦於識別任何差異，評估差異對最終狀態產生之影響及修正的行動，以保持作業能符合指揮官企圖。評估作業同樣強調對可能發生之後續及未來作戰的支援能力。

ASSESSMENT

2-23. Survivability measures are continuously assessed for effectiveness. Assisted by the staff, commanders compare the current situation with forecasted outcomes (evaluation) using measures of performance and measures of effectiveness to judge progress toward success. Staffs analyze the situation in terms of the mission variables (or operational variables or both) to understand the mission and prepare their running estimates. They continuously assess the effects of new information on the conduct of the operation; they update their running estimates and determine if adjustments to decisions are required. As threat conditions change, enemy tactics adapt, and lessons are learned, new survivability measures are established and implemented. This may include changes in employment methods, design modifications, and the use of different or improved materials.

評估

2-23 戰場生存力的作業方式應持續評估其效能。藉由參謀及指揮官，將現況與預期成果實施對照(評估)運用績效評量及效用評量以判斷向成功前進的進展。參謀依照任務變數(或作戰變數或同時依照兩種)分析狀況，以了解任務並準備其持續判斷，參謀持續對執行作戰時產生之新訊息所產生之影響實施評估；參謀更新所屬持續判斷並決定是否需調整決定。新的戰場生存力作業手段須隨威脅狀況之改變，適應敵軍戰術與否及已學習之經驗等因素而確立與實行。這些因素可能改變部署方法、設計修正及運用不同或改良之材料。

TRACKING TOOL

2-24. Several tools may assist engineers, other staff, and commanders in tracking survivability operations. Survivability timelines and matrices are used to indicate priorities of effort, track progress, and update the commander on the status of survivability operations. Examples of a survivability capabilities card and other tracking tools are provided in appendix C.

進度掌握工具

2-24 各類工具可協助工兵及其他參謀與指揮官掌握戰場生存力作業進度。戰場生存力作業之時序及矩陣被運用來指示作業優序、追蹤進度及為向指揮官更新戰場生存力作業狀態。附件 C 提供戰場生存力作業能力卡及其他進度掌握工具的範例。

2-25. The survivability timeline helps leaders understand the employment of engineer assets and the timing for initiating and completing survivability missions. It can include link-up times and locations, the designation of units supporting the task, and the duration of engineer efforts for a specific area. It synchronizes the effort by establishing time limits for completing site layout and marking fighting positions before the arrival of engineer equipment. A timeline also provides a visual display of asset employment, assisting the staff in ensuring optimal use of engineer equipment.

2-25 戰場生存力的時序表可幫助領導者了解工兵資材部署及戰場生存力任務的開始及完成時間。時間表可包含時間及位置的連結、指定支援單位位置及工兵能量在特定區域的作業時間。時間表藉由建立任務完成地點的時間限制及在工兵裝備抵達前完成戰鬥陣地設計與標記以使作業兵力同步。時間表同樣可以視覺化的方式呈現資材部署，協助參謀確保對工兵裝備的最佳化運用。

2-26. The survivability matrix can be used to show the commander the amount of survivability effort for each unit or BP. It provides an estimate of the type and number of fighting or protective positions to be accomplished within a designated timeframe.

2-26 戰場生存力作業表格可用於向指揮官展示各單位或各戰鬥據點的戰場生存力作業能量。且提供在指定時間框架內估計可被完成的戰鬥或防護陣地形式及數量。

Appendix C
Example Survivability Capabilities and Tracking Tools

The ability to communicate capabilities to a supported commander is critical for the commander's decisionmaking process. Capabilities are analyzed and assessed at each phase of an operation from planning through execution. Most capabilities are analyzed and presented to the maneuver commander as part of the engineer running estimate. The running estimate is a living document. As changes occur within the engineer structure (such as task organization changes, equipment availability due to maintenance) or to other conditions that may affect the estimate (such as changes in timeline or weather conditions), the capabilities assessment must also change. Determining a method to communicate these capabilities to the maneuver commander in a fashion that is meaningful or useful is critical.

This appendix provides a sample that an engineer can use to plan and communicate survivability capabilities while supporting operations. The sample may be modified to fit the type or size of the engineer unit supporting the maneuver force. This appendix also provides several techniques/tools used throughout the Army/Marine Corps to assist the engineer in tracking progress and keeping the commander and staff abreast of that progress. These examples (focused on survivability tasks) can be modified to fit any size or type of engineer unit, and are intended to keep leaders informed. These tracking tools may be updated at predetermined time intervals and passed to the engineer staff officer and supported commanders to keep them informed on the status and progress of the engineer work effort. When provided with this information, the commander possesses the flexibility to shift priorities to meet changing requirements and adjust to changing situations while optimizing the use of time and the available survivability capabilities.

附件 C　戰場生存力作業能力進度掌握工具範例

在指揮官的決心策定程序中，對受支援部隊指揮官的溝通能力是至關重要的，在各作戰階段的計畫至執行間，會針對所需能力實施分析與評估。多數能力經分析及向任務指揮官呈報後，可作為工兵持續判斷之一部分。持續判斷為需要持續動態更新資訊的文件，當在工兵內部結構 (如任務編組改變、因維保作業影響裝備獲得性)或其他可能影響判斷的條件發生改變時(如時序或天氣條件改變)，所需之作業能力評估亦必須改變。決定一種有意義且實用的方式，向任務指揮官溝通這些所需能力是相當重要的。

本附件提供一個簡單的範本，當工兵支援作戰時，可用於實施戰場生存能力之計畫與溝通。此範例可依工兵單位支援任務部隊需求，修正為所需形式與尺寸。本附件亦提供數項美陸軍/陸戰隊用於協助工兵追蹤流程的技術/工具，並保持指揮官與參謀能跟上作業進展。

這些範本(聚焦於戰場生存作業力任務)，此範例可被修正以符合各類型及種類工兵單位之需求，且能使領導易於獲得訊息，這些進度掌握工具可隨預定之時間間隔進行更新並傳送給工兵參謀及受支援部隊指揮官，以確保他們能獲知工兵兵力之作業現況及進程。當這些資訊被提供給指揮官時，指揮官就能擁有彈性去改變優序，以滿足不斷變化的需求，並在適應不斷變化情況的同時，優化時間及可獲得戰場生存力之運用。

ENGINEER CAPABILITIES CARD

C-1. The example capabilities card is focused on survivability effort potential. Normally survivability requirements will be competing against mobility and counter-mobility requirements. This tool tracks the current status and potential capabilities for employment against the commander's survivability priorities. Paragraphs C-3 through C-6 provide a discussion of how to track engineer (and other selected maneuver support) performance while executing essential tasks for M/CM/S and other tasks.

工兵支援能力卡

C-1 範例中所顯示的工兵支援能力卡著重在說明潛在的戰場生存力能量。一般而言戰場生存力需求將會與機動力及反機動力需求實施比較。本工具可依據指揮官的戰場生存力優序需求，掌握現況及潛在之戰場生存力作業部署能力。

C-3 至 C-6 的段落提供在執行所需之機動力/反機動力/戰場生存力必要任務時，如何追蹤工兵作業成果(及其他特定支援任務)的相關說明。

C-2. Table C-1, page C-2, provides a format to track survivability effort in a BCT/RCT, but can also be tailored to other echelons. This provides the engineer with a quick reference when discussing capabilities. It contains the most common pieces of equipment used in survivability preparation, and the most common materials available to harden facilities or vehicles. Users may adjust this form to fit individual needs or add items not currently on the card. This format will also assist the user in tracking maintenance availability for survivability resources.

C-2 表 C-1，C-2 頁提供用於旅團級戰鬥隊戰場生存力作業兵力的追蹤格式，但亦可修正以用於其他階層的部隊。此格式為一種快速參考資料，可提供工兵人員用於作業能量探討，本表格包含最常用於執行戰場生存力的作業裝備的及最常用於加固設施或載具的材料。使用者可調整格式以符合個人需求，或增加原有卡片沒有之項目，本格式也將可協助使用者用於掌握可獲得之戰場生存力資源所需維保能力。

Table C-1. Example survivability capabilities matrix

Equipment	*Assigned*	*Available*	*NMC and Primary Fault*		*Blade-team Hours*	*TDP/12 Hours*	*Tank Ditch*	*Meters Berm/ 12 Hours*	*Individual Fighting Positions*	*Crew-served Weapons Fighting Positions*	*Total*
D7 Dozer											
D5 Dozer											
M9 ACE											
M105 DEUCE											
Loaders											
SEE/HMEE/Backhoe											
SSL											
HYEX											
Crane											
Material	*Unit of Issue*	*Start Total*	*Used*	*Damaged*	*On Order*	*On Hand*					
Soil-filled Container											
Plywood											
2 by 4 Stud											
2 by 8 Stud											
4 by 4 Beams											
Corrugated Sheet Metal											
Concrete Barriers											
Jersey Barrier											
New York Barrier											
Texas Barrier											
Corrugated Metal Revetment Wall											
Plastic Soil Bin Wall											
E-Glass Sheets											
2-inch Foam Panel											
Chain Link (6 feet)											
Expanded Metal											
Welded Wire Mesh											
Other Resources											

Legend:

ACE – armored combat earthmover
DEUCE – deployable universal combat earthmover
HMEE – high mobility engineer excavator
HYEX – hydraulic excavator
NMC – not mission capable
SEE – small emplacement excavator
SSL – skid steer loader
TDP – turret defilade position

表 C-1. 戰場生存力作業兵力一覽表

裝備型式	配賦數	可使用數	不具任務執行能力或重大缺失		土方作業組工時	全遮蔽陣地作業工時/12 小時	戰車壕	護牆/12 小時	單兵戰鬥陣地	多人操作武器陣地	合計
D7 推土機											
D5 推土機											
M9 戰鬥 推土機											
M105 多用途戰鬥 推土機											
裝土機											
小型 挖土機/ 高機動型挖土機/ 多功能 工兵車											
小型裝土機											
液壓挖土機											
吊車											
材料類別	計量(個數，磅)單位	初始總量	已使用	損壞	已申請	現有數					
填土容器											
膠合板											
螺栓(2X4)											
螺栓(2X8)											
樑(4X4)											
金屬 浪板											
混凝土 障礙											
紐澤西護欄											
紐約 護欄											
德州 護欄											
波浪狀金屬 護牆											
填土塑膠桶牆											
E 級 玻璃纖維											
2 吋 發泡板											
鐵絲網											
擴張 金屬板											
點焊 鋼絲網											
其他項目											

USING COMMANDER'S CARDS

C-3. Commander's cards provide quick, detailed information to the commander in reference to engineer effort. Because the commander's time is limited, these cards should be easy to understand and provide accurate information. The engineer staff officer should portray effort available in comparison to effort executed. He should avoid providing commanders with raw data such as materials or blade hours. Instead, the engineer staff officer should consider providing numbers of positions or meters of berm available within the time allowed when discussing capabilities.

指揮官工兵作業參數卡運用

C-3 指揮官工兵作業參數卡可提供指揮官快速、詳盡的工兵能量資訊。因為指揮官時間有限，這些卡片應該易於理解且提供正確的資訊。工兵參謀官應以已執行量與可執行量之比值來描述，並應避免提供指揮官例如材料或土方作業時數等未經處理的原始資訊，反之，工兵參謀官在與指揮官探討作業能力時，應考慮提供在允許的時間內可獲得的陣地數量或護堤長度。

THE COMMANDER'S CARD CARTOON

C-4. Cartoons are a common method used to plan and track survivability effort. They are normally made using either a hand drawn representation of the AO or often a photocopied map sheet segment. Either method provides the commander a pictorial representation of the terrain, with a table portraying survivability effort planned versus executed. Several copies of this can be made and the staff engineer can update each with changes. Once the card is updated, the engineer can exchange the most recent card with the commander—providing the commander with the most current survivability status. See figure C-1.

指揮官工兵作業參數卡草圖

C-4 草圖為一種普遍用於計畫及追蹤戰場生存力的方法，通常採手繪的方式顯示作戰地區或通常為一個複印的分割圖幅。前述任一種方法均可將地形以圖像化的呈現給指揮官，並以一張表格描述戰場生存力之兵力原計畫與執行現況的比較。此資料可由工兵參謀產制數份副本且工兵參謀可針對各個改變的圖資實施更新。當卡片完成更新時，工兵即能以最近期的卡片與指揮官交換，以提供指揮官最符合現況的戰場生存力狀態，參閱圖 C-1

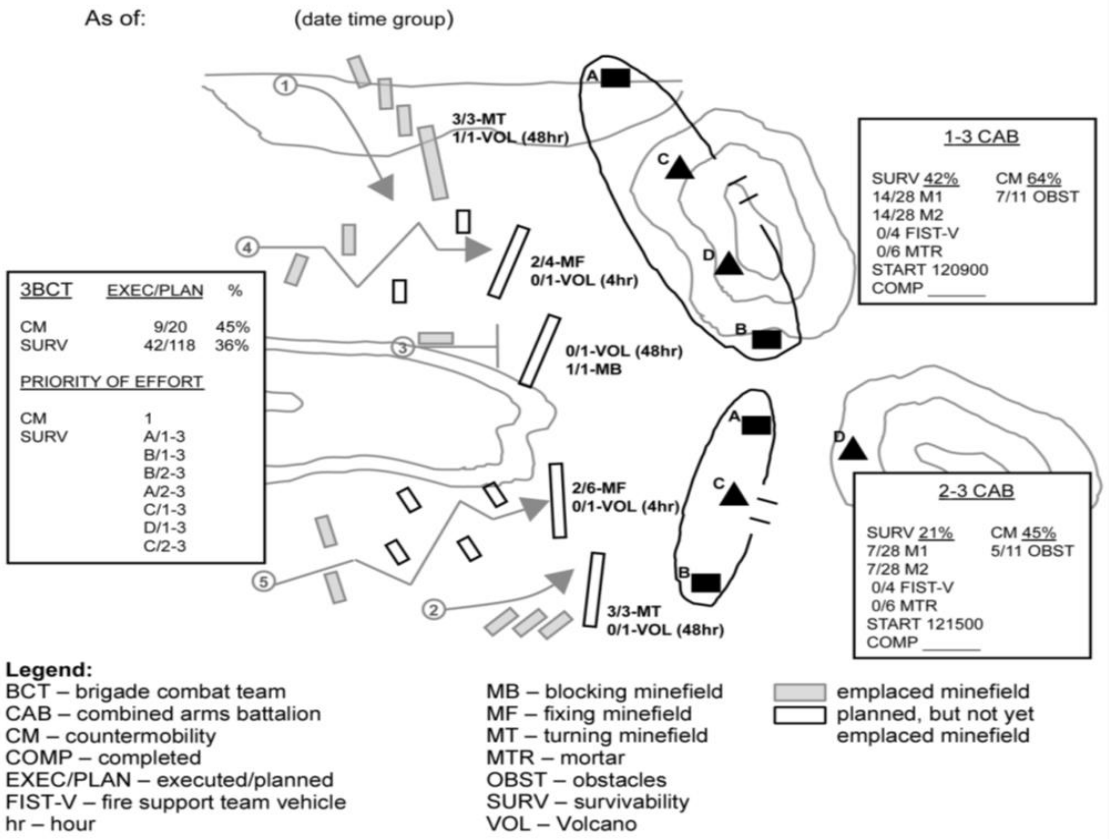


Figure C-1. Commander's card used to track M/CM/S effort in cartoon form (sample)

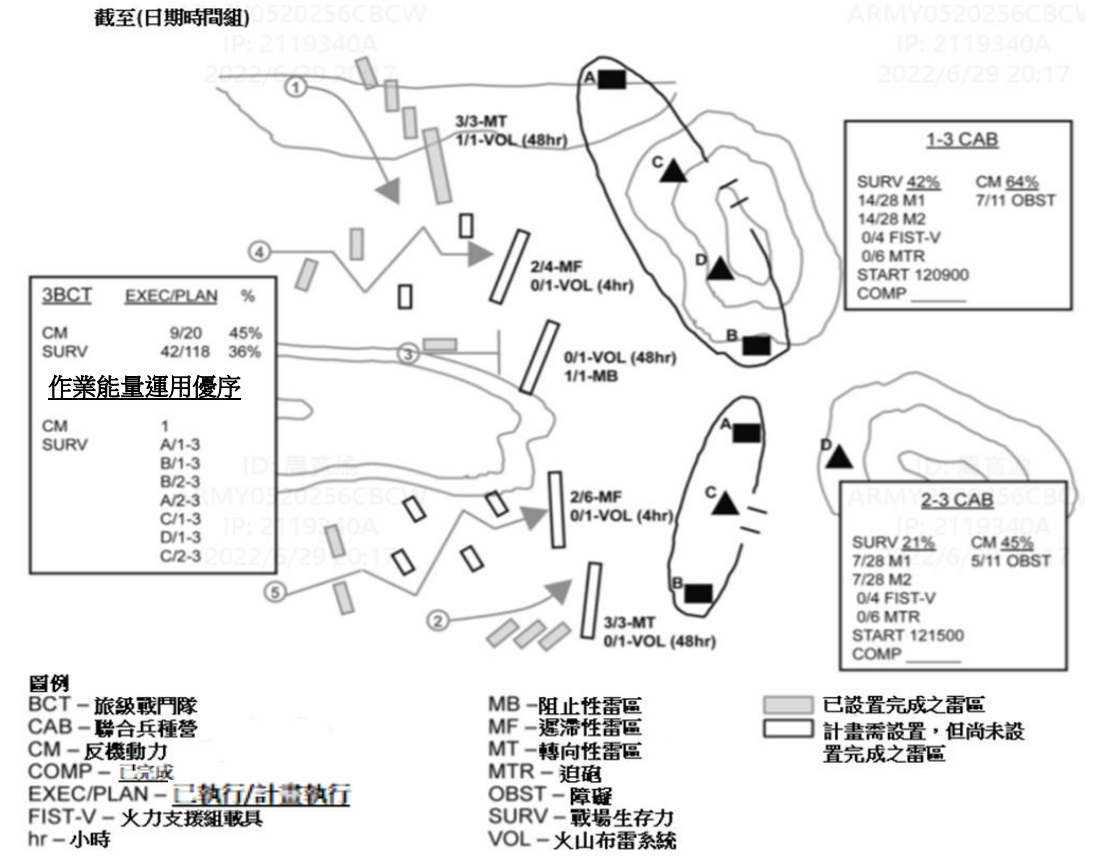


圖 C-1.指揮官工兵作業參數卡以草圖格式呈現用於追蹤掌握機動力/反機動力/戰場生存力作業量 (範例)

COMMANDER'S CARDS

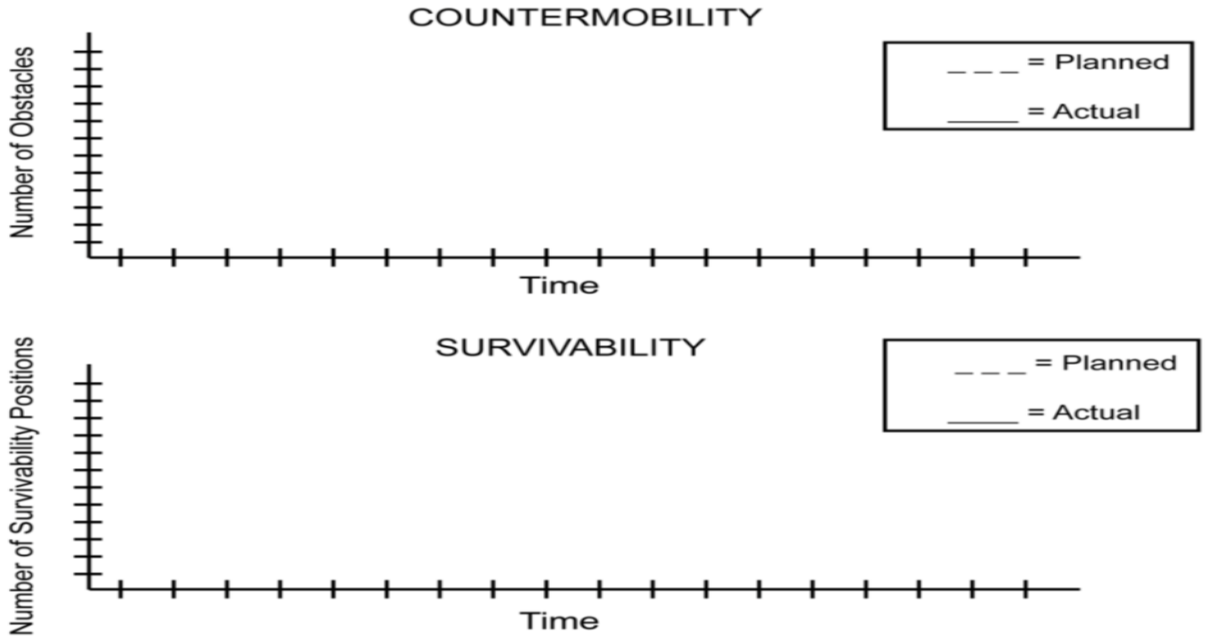
C-5. Commander's cards are another technique used to keep the commander informed. It is a survivability tracking tool in graph form which compares survivability effort planned to survivability effort executed over time. This method is effective because it quickly provides the commander information on the status in a constrained timeline and supports maintaining a running estimate. Again, this tool allows the commander to change priorities and make decisions regarding the survivability effort. These cards can combine M/CM/S information in the combat environment or focus purely on the survivability effort. The examples in figures C-2 and C-3 are intended (primarily) for use at the battalion and BCT/RCT levels.

指揮官工兵作業參數卡

C-5 指揮官工兵作業參數卡為運用另一種技術以保持指揮官能隨時了解相關訊息，本卡為採圖示之戰場生存力進度掌握工具，用以顯示隨時間變化，戰場生存力計畫執行量與已執行量之比較。本方法為一種有效的方法因為它可在時間受限的狀況下快速提供指揮官資訊並支援持續判斷的維持。在此重申，此工具可讓指揮官作為有關戰場生存力能量調整優序及下達決心之工具。這些卡片可在戰鬥環境中結合機動力/反機動力/戰場生存力資訊或單純聚焦於戰場生存力兵力。於圖 C-2 及 C-3 的範例 (主要)用於營級與旅/群戰鬥隊階層。

C-6. Commander's cards in table form are also a commonly used method. These provide raw numbers for the commander but have no pictorial representation of the terrain. They are effective in understanding resources available to the commander. This type of card is more commonly used in engineer headquarters to track and report material available. See figure C-4, page C-6.

C-6 以表格呈現指揮官工兵作業參數卡也是一種常見的運用方式，這可提供指揮官原始數據，但無法將地形以圖示化之方式呈現給指揮官參考，此種方法都有效地了解指揮官可運用的資源，此種卡片呈現方式較普遍用於工兵指揮機構，以掌握並回報可運用資源，參閱 C-6 頁，圖 C-4。



Note.
The "Planned" line should be adjusted as conditions change; for example, changes in number of available blade teams and Class IV/V shortages.

Figure C-2. Example commander's card used to track countermobility and survivability effort in graphic form

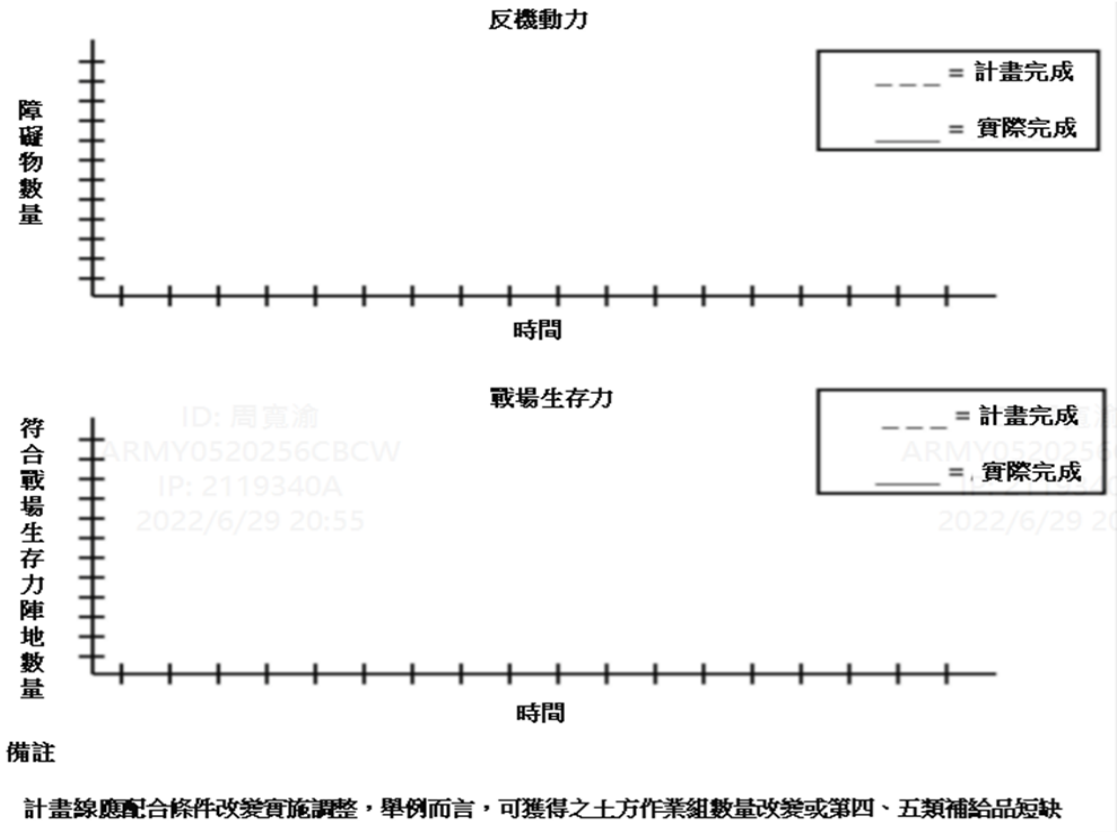


圖 C-2. 指揮官工兵作業參數卡以圖示呈現用於掌握反機動及戰場生存力作業量(範例)

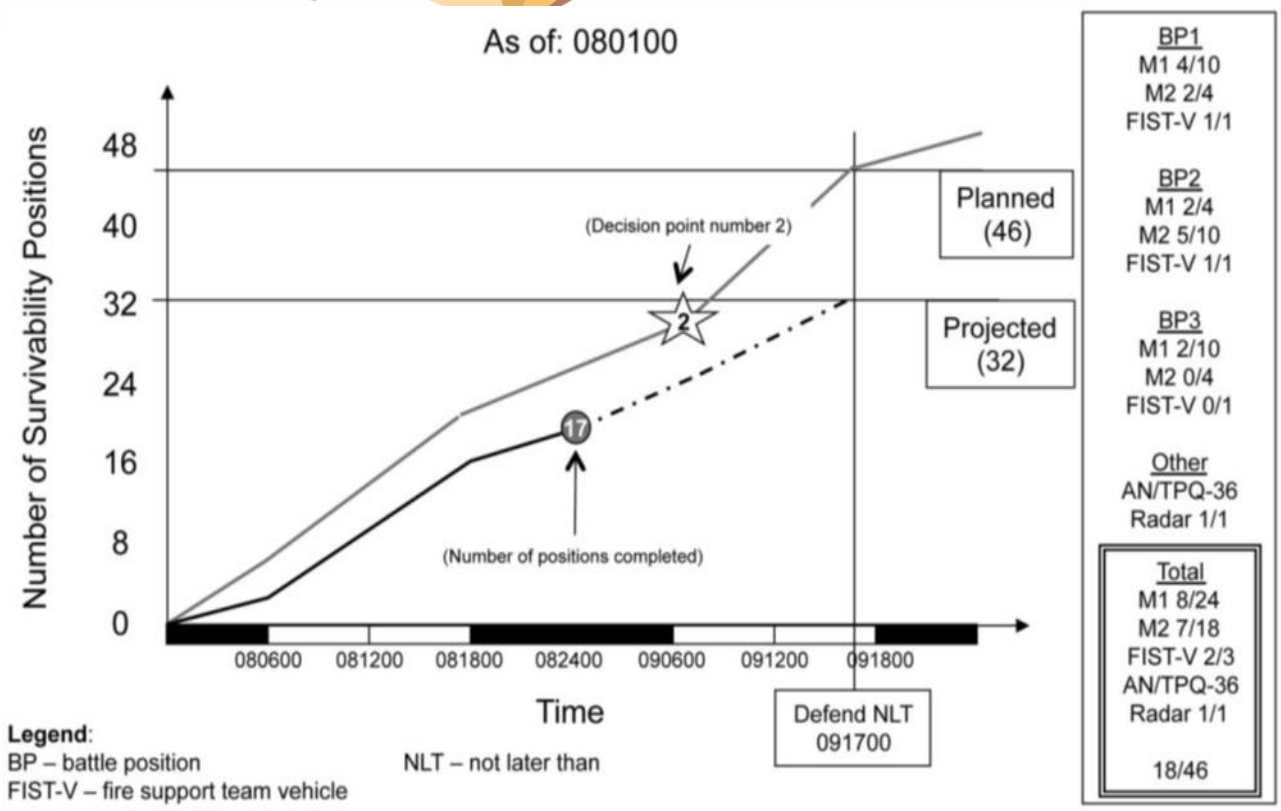


Figure C-3. Commander's card to track survivability effort (sample)

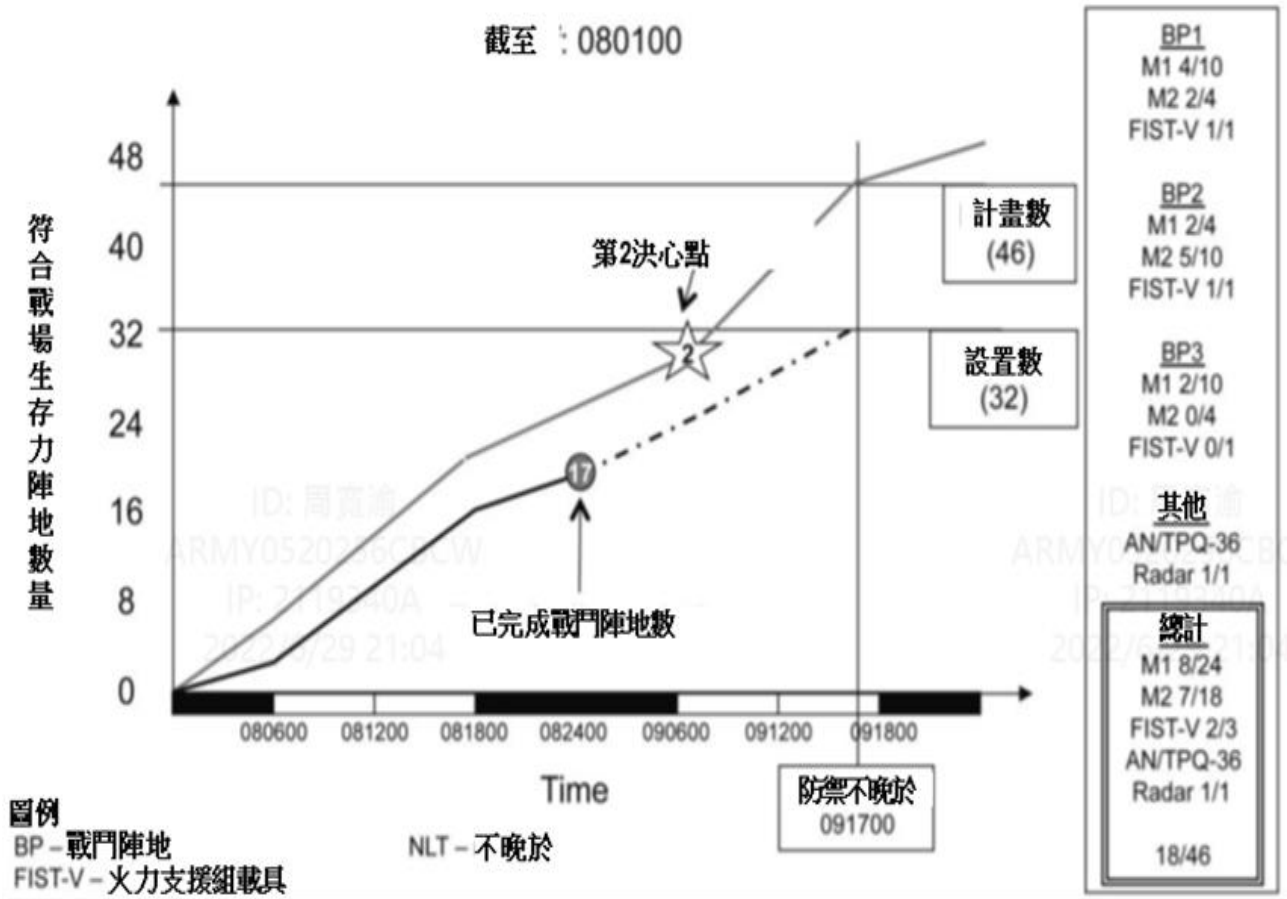
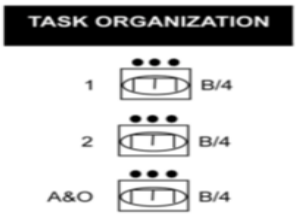


圖 C-3. 指揮官工兵作業參數卡用於掌握戰場生存力作業量(範例)



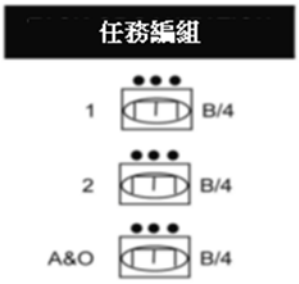
RESOURCES	
Assets	Status
Squads	6/6
M113s	8/9
M548	1/2
Volcano	1/2
V. Loads	
MOPMS	6/6
Hornet	10/10
Dozers	1/4
SEEs	1/2

COUNTERMOBILITY					
Class IV/V	TF Plan	BCT On-Hand	Used	% Used	Capability by time
Mines	344	1725	867	50%	1470
Concertina Wire	960	2300	437	19%	1200
Long Pickets	1500	2750	463	17%	1200

SURVIVABILITY					
Positions	Planned	Executed	To Std	% To Std	Capability
M1 Hull	16	9	0	0%	CBT VEH 27 INDIV 62 or CREW 31
M2 Hull	28	26	4	15%	
FIST-V	0	2	2	100%	
Individual	0	6	0	0%	
Crew					
Total	44	43	6	14%	

Legend:
A&O – assault and obstacle
BCT – brigade combat team
CBT VEH – combat vehicle
FIST-V – fire support team vehicle
INDIV – individual
MOPMS – modular pack mine system
SEE – small equipment excavator
Std – standard
TF – task force
V – Volcano

Figure C-4. Commander's card to track countermobility and survivability (table form) (sample)



資源	
資材	狀態
作業班	6/6
M113裝甲車	8/9
M548裝甲車	1/2
火山布雷系統	1/2
火山布雷系統部屬能量	
模組化布雷系統	6/6
黃蜂蛇型地雷	10/10
推土機	1/4
小型挖土機	1/2

反機動力作業					
第4/5類軍品	特遣隊計畫運用	旅級戰鬥隊現有數	已使用	使用率	計畫時間作業能力
地雷	344	1725	867	50%	1470
蛇腹型鐵絲網	960	2300	437	19%	1200
長樁	1500	2750	463	17%	1200

戰場生存力作業					
陣地類型	計畫構築數	已構築數	符合標準數	符合標準率	作業能力
M1戰車車身掩體	16	9	0	0%	CBT VEH 27 INDIV 62 or CREW 31
M2裝甲車車身掩體	28	26	4	15%	
火力支援組載具掩體	0	2	2	100%	
單兵掩體	0	6	0	0%	
多人操作武器掩體					
合計	44	43	6	14%	

圖例
A&O – 突擊與障礙連
BCT – 旅級戰鬥隊
CBT VEH –戰鬥載具
FIST-V – 火力支援組載具
INDIV -單兵
MOPMS – 模組化布雷系統
SEE – 小型挖土機
Std – 標準
TF – 特遣隊
V – 火山布雷系統

圖 C-4. 指揮官工兵作業參數卡以表格呈現用於掌握反機動及戰場生存力作業量(範例)