



## LESSONS FROM MILITARY ENGINEERING IN CRISIS SITUATIONS

COLONEL JAMIE STUART

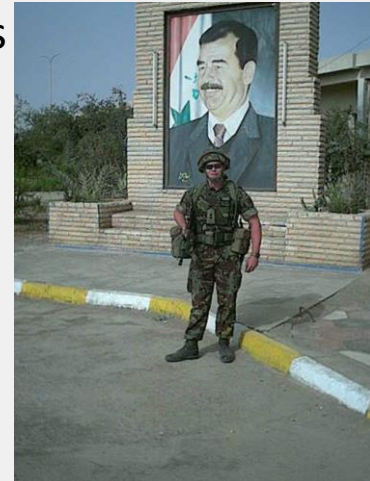
# SCOPE

- Background and Context
- Proposed skills and attributes
- Supporting examples
- Questions and discussion

# BACKGROUND

## 21 years as a Military Engineer Leading and managing at every level

- Multiple operational deployments – peacekeeping, warfighting and stabilisation
- Delivering a very wide variety of engineering projects and programmes



## What all had in common

- Uncertainty
- Complex natural environment
- Complex human environment
- Scarcity of resource
- Timeliness of delivery
- Human endeavour



# CONTEXT

While most civil engineer graduates will hopefully not need to deploy to conflict zones, the conditions and challenges presented by extreme climate events and natural disasters are very similar



## What all have in common

- Uncertainty
- Complex natural environment
- Complex human environment
- Scarcity of resource
- Speed of delivery
- <sup>4</sup> Human endeavour





# SO WHAT FOR CIVIL ENGINEERING GRADUATES

- Be innovative and imaginative
- Need to be able to understand complex situations and draw sensible conclusions
- Be comfortable with complexity and ambiguity
- Understand resources will almost always be scarce or unusual
- Embrace simplicity of design
- Must have a sustainable mindset - maintainable and repairable within local resource
- EQ – Patience and ability to work with multiple stakeholders



## EXAMPLE - KODOK CROSSING



An image from Op TRENTON 5 shows the bridge during the wet season.



A 14m culvert was assembled and put into place with Hesco wing walls for extra stability.



An additional half culvert was also constructed and placed to allow a greater amount of water to pass through.



Hesco was bounced out filled, using the LWT, to provide a retaining wall for the road.



Mil 5 Hesco installed to allow the road to the right to be levelled.



Mil 5 Hesco filled using a LWT.



Finished bridge with two extra culverts.



Finished side profile view.

**What:** Repair of the existing bridge at KODOK using a culvert. An extension of the road was necessary to be able to accommodate the heavy load vehicles.

**Where:** Kodok new INDBATT COB site

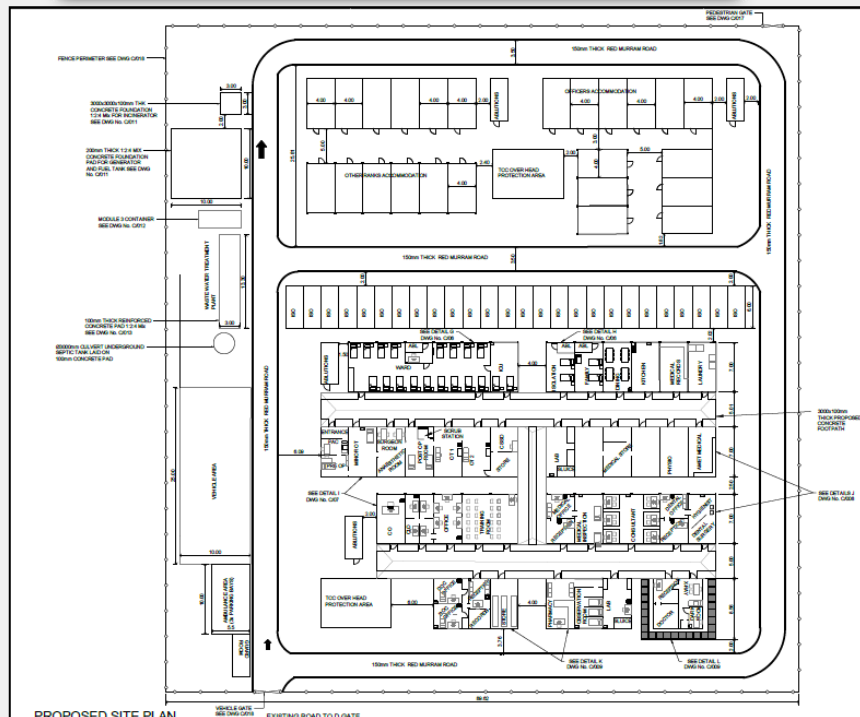
**When:** 8 - 29 Mar 19



# EXAMPLE – MALAKAL LEVEL 2 HOSPITAL



**What:** Level 2 Hospital Unit 1  
**Where:** Malakal  
**When:** 30 May19



**What:** Pad 3 formwork  
**Where:** Malakal  
**When:** 30 May 19

# QUESTIONS AND DISCUSSION

- Be innovative and imaginative
- Need to be able to understand complex situations and draw sensible conclusions
- Be comfortable with complexity and ambiguity
- Understand resources will almost always be scarce or unusual
- Embrace simplicity of design
- Must have a sustainable mindset - maintainable and repairable within local resource
- EQ – Patience and ability to work with multiple stakeholders

