



Australian
sapper

2019





ROYAL AUSTRALIAN ENGINEERS SAPPERS' FUND



Why subscribe?

Subscriptions to Sappers' Funds provide the income that allows us to care for our heritage and foster Esprit-de-Corps.

The Corps of Royal Australian Engineers has a collective responsibility to our predecessors and ourselves to ensure we preserve, protect and develop our heritage as well as continue to build our identity into the future.

Your contribution, along with all the other serving and retired members of the Royal Australian Engineers making a similar commitment, is extremely important. This ensures your Corps Committee can support the fostering of our esprit-de-corps and the unique 'Sapper identity' remains a fundamental part of Army's culture and traditions

What is the cost?

The annual cost of subscriptions is as follows:

ARA Officers -Sergeant: \$52 per annum (\$2 per fortnight)

ARA Corporal -Sapper: \$26 per annum (\$1 per fortnight)

ARes Officers: \$30 per annum

ARes ORs: \$20 per annum

Ex-Service Officers: \$30 per annum

Ex-Service ORs: \$20 per annum

RAE ex-service Association: Annual Donation

For further information or to request support from the Fund, contact the RAE Head of Corps Cell via email at: rae.hoc@defence.gov.au

What is the benefit?

Individuals may benefit from Sappers' Funds, either directly or indirectly. The Sappers' Fund provides financial support to:

- Corps sporting events, teams and tours
- Corps adventure training activities
- individual and team engineer awards and prizes including Battle Field Tour
- publication of Corps and unit histories
- RAE Association Victoria heritage and history trail plaques
- establishment and upgrade of RAE Memorials
- purchase of wreaths for funerals and remembrance of serving members
- assistance to Army History Unit to manage historical items relevant to the RAE
- RMC graduation prize

Individuals, groups and sub-units/units of the Royal Australian Engineers and affiliated Associations can apply for support from the fund at any time.

How do I subscribe?

Subscriptions can be made by electronic transfer / direct debit to the following account:

- Australian Military Bank BSB No: 642-170
- Account Number: 100001677
- Name of Account: RAE Sappers' Funds

Please include your PMKeys number and surname with your payment.

Contents

Message from the HOC	4	22nd Engineer Regiment	68
Message from the CRSM.....	6	3rd Field Squadron	70
The Royal Australian Engineers Foundation	8	13 Field Squadron	73
LAND 8160-1 Under Armour Bridging and Breaching	9	Special Operations Engineer Regiment	74
Directorate of Officer Career Management – Army	10	Back Off He’s Mine	91
Directorate of Soldier Career Management - Army	11	Richard Atkinson memorial unveiled	92
School of Military Engineering	13	Personnel Matters	94
1st Combat Engineer Regiment	24	Sapper Obituaries ‘Lest We Forget’	95
2nd Combat Engineer Regiment	31	Returning to the Pacific International Policy Division	100
3rd Combat Engineer Regiment.....	39	Building great engineers	102
5th Engineer Regiment	45	Turning the flywheel, building great engineers	103
6th Engineer Support Regiment.....	47	Sappers In Paradise	109
11th Engineer Regiment	55	The RAE Collection and Museum	117
19th Chief Engineer Works	58	RAE Corps Shop Price List.....	119

Australian Sapper is the annual magazine of the Royal Australian Engineers, published by authority of the Head of Corps.

Copyright

Text and images in this publication are sourced from the Department of Defence and are copyright of the Commonwealth of Australia unless otherwise credited. Enquiries regarding the use of material in this publication should be directed to the Editor.

Contributors are urged to ensure the accuracy of the information contained in their articles; the Editorial Board accepts no responsibility for errors of fact.

The views expressed in this publication are the contributors’ and not necessarily those of the Royal Australian Engineers, the Australian Army or the Department of Defence.

ISSN: 1449-4140

Editorial board

Editor-in-Chief: Brigadier John Carey CSC

Editor: Major Clive Riddle

Assistant Editor: Captain James Martin

Graphic Design: Mr George Petrovski

Contact the editor: RAE.HOC@defence.gov.au

Cover: LCPL Bradford 2 CER places a charge to destroy unexploded ordnance during the 2019 Steele Cup Competition

Message from the Head of Corps Royal Australian Engineers

BRIG John Carey, CSC



Welcome to this 2019 edition of Australian Sapper.

This year again reinforced that Engineers are integral to every field of human endeavour. It should not be surprising, since 1902, Australia's military engineers have pushed boundaries, defied odds and developed innovations leaving a rich heritage and enduring legacy.

Today our Corps is composed of a great depth of experience, a wide breadth of engineering knowledge, and an incredible force of innovative Sappers – particularly our young leaders. In Iraq and Afghanistan, to PNG and Vanuatu, from Timor to the Philippines, and Antarctica to Jigalong – we are partnering with Engineers from multiple Nations and Services. It is a pivotal time in our history – solidifying the enduring lessons learned from over a decade of combat; 'Building Great Engineers' by creating a Corps' foundation for future multi-domain operations; supporting specific Engineer missions in the Pacific and South-East Asia; and applying all this to the incredible challenges we face in an era of persistent competition, cooperation and conflict.

As a Corps we provide engineering solutions for our Nation's toughest challenges. Our mission is to promote national interests, influence vital regions and enable the Joint Force to live, move, fight and win the Nation's battles. As Sappers we are volunteers bonded with comrades in a shared identity and culture of sacrifice and service. I have noticed that Engineer leaders remain in high demand; when confronted with a problem, Army leadership looks for an Engineer to solve it. We are providing specific enabling capabilities in support of combat missions, special operations, force engineering, humanitarian assistance and disaster relief, capacity building, environmental and facility management, technical design, and research and development. Australia's Sappers are multi-skilled soldiers, combat engineers, tradesmen and engineering professionals.

The Chief of Army's direction on our future is clear: as a Corps we must **PREPARE** our Sappers for multi-domain warfare; **SUPPORT** our deployed and deploying forces; **LEAD** the evolution of the Modular Engineer Force, including the raising, training, sustaining and employment of military engineers; **CARE** for our Sapper Family, including serving members, their Families, our Wounded, Injured and Ill and in the spirit of 'Once a SAPPER, Always a SAPPER,' our veterans and ex-serving members; **CONTRIBUTE** to the development of Joint, Allied, Coalition, and Interagency capabilities; **CAPITALISE** on innovation, experimentation and technology; **REINFORCE** our enduring relationship with military engineers in the US, UK, NZ and Canada; and **BUILD** strategic partnerships across the Indo-Pacific region, as well as with industry, academia, emergency services and professional associations.

From what I have seen we are leading the way... and it speaks to the power of inspiration. During the last twelve months, each of us have been inspired by others in the Corps. Perhaps outstanding and authentic leaders like Colonel Rob Sanders and Warrant Officer Class Two Greg Miller, remarkable



An HX-77 heavy vehicle drives onto a Medium Girder Bridge during Ex SAPPER SPAN in Gayndah, QLD.

men taken from us far too early – Lest we forget. The Sapper Family promises to do everything we can to ensure their kin are for ever supported. Maybe it is the young men and women focused on modernising our force and leveraging technology to increase our future capability. There is some awesome work happening right now in the Corps with unmanned aerial systems and robotics, 3D printing, CBRN-D, bridging, simulation, water purification, combat engineer diving and blended learning and training design, just to name a few. It could be the section commander who not knowing what the next crisis will bring, makes the most of every minute of the day to ensure his troops in the Ready Brigade are trained for any possible situation. Perhaps it is the recently graduated Troop Commander confidently leading her Mobile Training Team in PNG or the Works Supervisor coordinating a multi-million dollar infrastructure project in Fiji. It could be the vehicle mechanic that achieves miracles when repairing our trucks. Whether, it was supporting Operation FLOOD ASSIST II; deploying at short notice to the Solomon Islands to conduct a leak, seal, pack of a chemical munition; developing plans to build our works and construction capabilities; leading efforts to acquire armoured breaching equipment; bringing together Sapper Associations from across Australia to better support soldiers; live firing during the CATA

or TALISMAN SABRE; or directing and guiding over 2,000 trainees in the schoolhouse; I am sure we have all been inspired by somebody in this Corps.

Regardless of our ECN, trade, or duties – our Army and Corps needs more inspiration. We need to adapt, innovate and overcome, in order to get to the objective and accomplish the mission, whatever it is...And to me, that's what being a Sapper is all about: a state of mind that figures out how to get the job done – no matter what – and has the willpower, perseverance and strength to see the mission through to completion... all the while taking great care of our People.

So, to each of you, be proud of your year. Be proud of your Corps. Sappers will always be first on the scene, first to help, first to contain a developing crisis, and first to fight if required to do so. We will always expect to be last out. We are the 'force of choice' for the Army, Joint Force and Nation. No matter what the crisis, our military and civilian leaders will always have one shared thought – 'Follow the SAPPER!'

Good Soldiering,

Ubique.

Message from the Corps Regimental Sergeant Major Royal Australian Engineers

WO1 Sean Chainey DSM



Fellow Sappers

The Defence contribution to the Governments Pacific Step Up Program has triggered a great deal of discussion and analysis of the construction trades, in particular direct entry recruiting, training and promotion frameworks, competency requirements, current tempo and retention initiatives. It has also highlighted the current manning issues being experienced in both vertical and horizontal trades. This combined with the reintroduction of a RAE survey capability following the move of the geospatial capability to the Intelligence Corps has been a major focus for the Trade and Training Cell.

In Combat Rescue, the existing Operator Emergency Response Course is being remodelled into a Combat Rescue Course focussed on Technical Rope Rescue and Dismounted Rescue and will include insertion and combat skill sets. The course is planned for trial in 2020 and will set the conditions for this capability to be become fully developed. Combat Rescuers will still conduct the ADF Fire Fighters Course until a point when the difference in capability roles make continued joint training unsustainable.

Combat Engineer IET will also see major changes in mid-2020 with the new RAE IET continuum replacing the existing four phases of training with the following:

- 25 day Military Engineer Course, to provide the knowledge and skills required to be employed as a soldier in the RAE regardless of trade or specialisation (All RAE)
- 60 day Combat Engineer Course to provide the skills, knowledge and attributes to be employed as a CE Sapper. (CE Only)

Within the Combat Engineer Courses there has been significant work conducted by the SME to update the threat for explosive hazard reduction (EHR) operations conducted by CE. This is a skill set where role clarity has become ambiguous in recent operations and this training; combined with EHR training at all stages of the promotion continuum will address this. It will also be supported with the re-write of the Mines, Booby Traps and IED pamphlet, which will clearly define the scope of an EHR operator.

Within foundation war fighting, when the risk to the entire force of denied freedom of movement outweighs the risk to an individual, the CE must be trained to clear the way, regardless of type of explosive threat. Balancing this risk threshold against the mission is the task of RAE Commanders and together we must become mature enough to understand when the CE should conduct these tasks or when EOD should have primacy. Search and EHR procedures will also be aligned with urban breaching in line with current threats.

Similarly, in EOD there is great work being done by SOER and 6ESR to modernise the Mod 3 RAE EOD Course to produce a Technician capable of dealing with current and emerging threat devices. Additionally, EOD rank structures are being changed to allow a LCPL EOR entry point. This change is due to be formalised by DFRT in early 2020.

My appointment to Corps RSM this year was a very proud moment for my family and myself. I can confidently say that to serve as CRSM RAE will be the professional highlight of my career, whatever



LCPL Adams and CPL Donnelly (3CER) during the 2019 RAE Sapper Competition.

comes next. I would also like to acknowledge the many that shaped my journey to this point. People like Graham Toll, John Kirkham, Craig Egan, Brent Doyle, Barry Wade, Gareth Molnar, Daniel Costelloe and David Willis have been an example to me of what right looks like. Though no formal contract, and potentially a surprise to some listed, the character they displayed greatly influenced me and I expect many others.

This is something I am very passionate about - you are all an example or a mentor to your subordinates, peers, superiors, family and community whether you are aware of it or not. Your conduct, and the example you set, regardless of position, produces your units' culture, sets the boundaries of expected behaviour and builds or reduces RAE capability and Esprit De Corps. "Are you a soldier or do you work for the Army"? How do you describe yourself and what is your understanding of the difference? To me the answer is simple. A soldier does not simply obey Army values; they believe in them. The strength of this

belief is not governed by length of service, number of operations, your current medical classification or how much you can bench; rather it is determined by an individual's character.

As you, become closer to the end of your career than the start, your propensity for reflection should increase. In our efforts to serve our Nation, always looking forward to the next challenge or task, combined with the normal pressures of life and supporting our families, we can sometimes forget to recognise what we have achieved. Every Sapper in the Corps has passed through gates that many others could not accomplish. You should be rightfully proud, whatever your position, in what you have achieved in earning the honour to wear the Rising Sun. I wish you and you families every success into the New Year and beyond.

Once a Sapper, Always a Sapper.

The Royal Australian Engineers Foundation 'For Sappers, By Sappers'

Chairman RAE Foundation - Brigadier Wayne Budd AM, CSC



One of the strengths of our Corps is the concept of a Corps Family which exists both during a member's service in the Army and extends to the years that follow. This sense of family and the desire to ensure the strength of the family led a small group of Corps veterans to establish a foundation dedicated to the support of the Corps and our members. With Government endorsed charitable status, the RAE Foundation has operated for over 20 years in support of the Corps.

The Foundation operates in a number of key areas. It supports Corps members and their families where a need exists that seemingly doesn't have an alternative solution; it supports specific educational requirements of Corps members; and it supports the maintenance of the heritage of the Corps. These aims are supported by a constitution that meets the Governments charity requirements and guides the provision of support. The Foundation is governed by a Board of Directors who have served in the Corps either full time or part time. Current full time Directors have been included on the board to ensure connectivity to the serving Corps.

With the current Foundation setup, great flexibility exists for the Foundation to support the Corps. An example of this in 2019 was the support provided to members of 3 CER affected by the Townsville Floods. On request from 3 CER, the Foundation was able to

collect relief funds offering tax deductibility to donors and direct those funds in support of the personal losses that occurred. Many former serving members provided funds for this relief effort and in excess of \$27,000 was able to be directed to affected members.

Additionally, the Foundation provides the numerous RAE Associations a means of hosting their web presence and brings a level of coordination to messaging for former serving members. We aim to expand this capability in 2020 as we support the Head of Corps' desire to have a stronger connectivity with those who have finished their period of service.

The Foundation is independent of Government and Defence with its focus solely on the welfare of the Corps. The support provided is directed based on the need developed within the Corps. As a not-for-profit organisation it funds support through fund raising. The key element of our fund raising ability is the Government charitable status and the tax deductibility of donations. For information on the full scope of what the Foundation does and how you can make a contribution or become involved, visit the Foundation's website at: www.raefoundation.org.au

Remember this Foundation is for the Corps and its members. Your support is appreciated.



Project LAND 8160-1

Under Armour Bridging & Breaching

MAJ Jason Law

The introduction of an armoured engineering capability through project Land 8160-1 progressed through the Gate 1 submission process this year. At the time of writing the project is under Government consideration for approval. Over the last 12 months the project has been able to refine options for this capability to two vehicle systems, being the M1 Assault Breacher Vehicle (ABV) and M1 Joint Assault Bridge (JAB).

The capabilities presented by both the ABV and JAB are a significant step change to how Sappers are able to provide support to a combined arms team. As an example, the JAB will be capable of bridging an 18m gap in a few minutes, with just two Sappers who are able to operate within the protection of an M1 Abrams vehicle at all times.

The ABV is a vehicle that is modular in nature and as such offers a wide variety of capabilities to the land force, primarily in obstacle breaching, but also in counter mobility and survivability tasks. The base vehicle is an M1 Abrams variant crewed by two Sappers, a driver and commander. It is fitted with a .50cal remote weapon station as well as two Mine Clearing Line Charges (MICLIC). Each MICLIC is able to reduce a 100m section of a minefield through a rocket propelled explosive charge.

The ABV can be fitted with a range of attachments that provide the vehicle with additional capabilities. Following the firing of a MICLIC the ABV is able to

prove a lane through a minefield with the use of a full-width mine plough, a surface mine plough or a roller system. These three attachments provide options to the Engineer commander on how to best breach an obstacle depending on the situation and environment. As the ABV moves through an obstacle the lane marking system shoots poles into the ground on either side of the vehicle to indicate the safe path for follow on vehicles. A single ABV is able to reduce and prove a lane through a minefield.

Where other obstacles exist, the ABV can be fitted with a dozer blade. This is beneficial in the breaching of ditches by filling them with earth, movement of rubble in the urban environment or digging of vehicle fighting positions in defensive operations. An alternate attachment is the excavator arm that is capable of lifting or pulling an obstacle out of the way. The excavator arm is also capable of digging infantry fighting positions to support defensive missions.

The ABV and JAB are able to complete tasks with the crew remaining protected within the vehicle at all times. This capability will see jobs that currently take hours and up to a Troop of personnel to complete, conducted in minutes by as few as just two Sappers. Land 8160-1 remains on schedule to introduce vehicle to service from 2024.

*Left: Assault Breacher Vehicle with Fall Width Mine Plough
Right: Joint Assault Bridging vehicle*



Directorate of Officer Career Management – Army

MAJ Gregory Jones

It's been a big twelve months for the Corps. Since the last Sapper Magazine, we have seen the establishment for 19 CE Works grow by almost 40%, the creation of an additional Trade Troop and the formal establishment of the third EOD Troop at 6 ESR, embedding of RAE personnel into International Policy Division, and the completion of the RAE Capability Establishment Review. As a Defence Force we have been asked to refocus our efforts into the South West Pacific, so not surprisingly Sappers have become one of the most influential force elements to gain traction throughout that region, be it through Construction or Combat Engineering. The Military Engineering effect is in high demand!

From a DOCM-A perspective, it has been a period of growth and evolution, starting with the rapid reorganisation of our Officer workforce in December 2018; re-posturing for a larger volume of infrastructure works, and continuing to progress as we consider future demands for not just infrastructure but also armoured engineering, bridging, CBRN and EOD. There have even been changes occurring to support dive capability and hydrographic survey capabilities across the Corps. Ultimately, the people have been the key strength throughout all this change, accepting shifting targets and grasping the larger intent without rancour. As a career advisor, it has been refreshing to see just how flexible and energised the Corps is, accompanied of course by the expected level of verbal jousting when required. We have done brilliantly in adjusting to change thus far, and I'm sure we will cope equally well with the further adaptation required in the next twelve-months to ten years.

From a pure numbers perspective, it is worth stepping back and looking at the Corps. Our separation rates have dropped slightly over the last twelve months, and the level of interest in the Corps has increased. At RMC-D Corps Allocation Board this year we were once again one of the most popular Corps, with fierce competition for positions in both mid-year and end-of-year graduating classes. Defence Force Recruiting continues to report very high interest levels, especially for construction roles into the near-region. Despite this level of competition, Army's ability to generate asset through normal methods (RMC-D 12 – 18 month

General Service Officer) is at maximum capacity, so the Corps has had to look at contemporary solutions to fill the growth in establishment. As a result of these pressures, from January 2020 RAE will commence a Direct Entry Officer stream to recruit technically qualified individuals into the Corps. The focus is across all both the Reserve and Regular force, and will recruit construction, hydrographic and scientific specialists to augment our military engineering prowess and support capabilities we need now and in the near future that are hard to grow rapidly through conventional methods. These Direct Entry Officers will assist us in bridging the gap between current capability levels and the desired future engineer effect.

The Corps should be proud of its efforts. We continue to perform strongly at competitive selections for operations, representational roles, promotion and Staff College, and we continue to provide a highly valued contribution to the everyday efforts of Army and Defence. Everywhere you look, there are Sappers in positions of responsibility and influence, quietly and competently maintaining the momentum that we need as an organisation, especially as we shift to an Accelerated Warfare focus. Our efforts are recognised and well appreciated across Army, but our impact as a Corps goes beyond pure military outcomes. We are not just a force enabler for military operations; we are also a political enabler for national objectives, and our Sappers are doing a fantastic job at both.

Directorate of Soldier Career Management - Army

CAPT Ben Turner, WO1 Scott Middlemis, WO1 Darren Parsons

Soldier Career Management Agency – RAE

The 2019 CMC closed at the end of September this year with the release of the second round postings and the commencement of the CMC 21 PAC series. The RAE Team would like to take the opportunity thank the unit command teams on a successful year and for facilitating a productive Career Advisory Tour. Additionally, the team would like to thank the wider RAE community for their patience in what was a tumultuous 2019 and for their professionalism in taking an active role in the management of their careers.

WO2 Portfolio

Congratulations on another strong year by the WO2 portfolio in Corps and representational appointments, in the All Corps environment and overseas. Of note, below are the 2020 SSM appointments:

1 CER – WO2 Kenneth Hughes
 1 CER – WO2 Paul Johnson
 2 CER – WO2 David Wallace
 2 CER – WO2 Spencer Wolfe
 3 CER – WO2 John Battle
 6 ESR – WO2 Daniel George
 6 ESR – WO2 Robert Dolan
 SOER – WO2 D
 SOER – WO2 G
 RMC – WO2 Daniel Hedges
 RMC – WO2 Mark Everingham
 RMC – WO2 Stuart MacFarlane
 1 RTB – WO2 Doug Royle

Combat Engineers

2018 promotions:

LCPL – 49
 CPL – 3zi5
 SGT – 18
 WO2 – 14
 WO1 - 1 141 TR WO2 - 2

CMC 21 PAC:

096 TR SGT – 23
 141 TR SGT - 4
 432 TR SGT – 9
 432 TR SGT – 9
 096 TR WO2 – 9
 432 TR WO2 – 7

The manning pressures at different ranks remain the same as last year, particularly at SGT. Units continue to manage the LCPL/CPL vacancies created by annual posting and promotion cycle by identifying worthy SPR/LCPLs to promote.

Vacancies remain at most units at the SGT rank for 096, 141 and 432; however, the numbers taken to PAC for CMC21 should assist in reducing the vacancies, despite the growth in liability as a result of the CERs conducted in 2021.

After many years being managed with the ECN 180 and 423's the 141 are now managed from DSCM-A as part of the RAE Combat trades. TR SGT and WO2 PAC were conducted this year for CMC21 after not being conducted last year. While the trade still remains relatively healthy, with SPR numbers in the CERs over establishment, there was a need to grow SNCOs to allow for some movement in the LCPL and CPL ranks. The changes to 141 from Emergency Responder to Combat Rescue that are in the pipeline will be challenging for the trade and the Corps as a whole.

Changes will be made to the Manual of Army Employment for all RAE trades and they have been socialised with the senior members of the RAE. Once they are approved for release, any impacts relating to career management will be communicated through the CoC to those affected. I would like to remind everyone that the current MAEs are still in effect and remain so until the new ones have been through the DFRT and are endorsed.

WO1 Glen Donaldson will take on the Career Advisor job from January 2020. I encourage you to provide WO1 Donaldson the same level of engagement that you have had with me over the last two years to ensure he is able to communicate and balance the service need, your career development and your personal preferences.

Construction Trades

The following numbers were presented to PAC:

TR SGT PAC

ECN 270 – 5 Mbrs
 ECN 374 – 5 Mbrs
 ECN 385 – Plumber(3), Electrician(2)

TR WO2 PAC

ECN 270 – 4 Mbrs

ECN 374 – 6 Mbrs

ECN 385 – 5 Mbr

TR WO1 PAC

ECN 217 – 7 Mbrs

Substantive Promotions in 2019

ECN 026 (SVY) – 1 x SGT, 1 x CPL, 2 x LCPL

ECN 072 – 6 x CPL, 4 x LCPL

ECN 101 – 1 x LCPL

ECN 125 – 2 x CPL

ECN 314 – 2 x CPL, 1 x LCPL

ECN 270 – 2 x WO2, 4 x SGT, 5 x CPL, 7 x LCPL

ECN 374 – 3 x SGT, 1 x WO2

ECN 385 – 1 x SGT

ECN 217 – 1 x WO1

The Employment Category Review Endorsement Meeting (ECREM) was revised and partially presented to the Defence Force Remuneration Tribunal (DFRT) for acceptance and ratification. This saw the Surveyor, Construction and Emergency Responder Trades presented in the first tranche of the process. The remainder of the Corps is to be presented in early March 2020.

A substantial amount of effort has been afforded to the management of all Construction Employment Categories, with four categories now being listed as Critical (ECN's 072, 125, 270 and 374). Of positive note is the increased interest in the ECN 270 stream which should see the hollowness minimised by Dec 2020. I thank all CoC's for supporting us in this area.

Increased directed training numbers has seen a substantial number of the vertical trades complete ITT and post into SME to conduct their OJT. This should see up to 25 new trades men and woman graduating into the Land Force in 2020. A revised RCC/RPL process has now been implemented providing some measure of certainty for non-RAE tradespeople to transfer more efficiently.

The ADF's Land Survey capability still resides within the RAE and further development of both training and career pathways is ongoing. A Long Term Schooling serial is currently being considered, with members potentially gaining an Advanced Diploma of Surveying on successful completion.

The South Pacific Step Up works continue to allow the Corps construction trades to support and

enhance the whole of government efforts, within our regional sphere of influence. Future planning may see the re-raising of 12 CE Works, with strong rumours of that third phantom Construction Squadron being considered. This would provide a substantial capability without offset, to balance the current Ready, Ready and Reset cycle of the Combat Brigades, along with an enhanced project management capacity.

To everyone separating, transferring, moving or promoting, we offer our best wishes and congratulations. We wish you good luck for whatever your future endeavours might hold, however, remember you have earned the right to be called SAPPER.

Ubique

School of Military Engineering

LTCOL Dave Evans

The School of Military Engineering (SME) – “The ADF’s Engineering Centre of Excellence” and Home of the Sapper – has continued to produce excellent results while delivering a wide array of military engineering courses throughout 2019. Facing the challenge of an ever-increasing Directed Training Requirement across almost all courses, the staff at SME have been incredibly busy and I thank everyone for their efforts. In particular, I would like to thank the instructors of the unit. Your professionalism, dedication to your courses at all hours, and your adaptability to changes in Army’s training delivery system are commendable.

With WO1 Glen Donaldson spending the majority of the year deployed to Afghanistan, I’ve been ably supported this year by my acting RSM, WO1 Mark Grigg. We once again started the year with an SME Open Day, showcasing the School and Corps Museum to family and friends, and it was fantastic to see even more attendees at this important annual event.

SME enjoyed an early Professional Military Education presentation by International Policy Division’s new Indo-Pacific Enhanced Engagement Branch (IPACE). This presentation reinforced that the School and the Corps are at the forefront of Defence’s contribution to Pacific Step Up, and provided meaningful context for our international engagements throughout the year. This year we have hosted 30 trainees from our partner nations, including New Zealand, Malaysia, Papua New Guinea, the Philippines, Indonesia, Fiji and Tonga. Our own staff includes seconded members from Papua New Guinea, the United Kingdom and the United States of America, who compliment the staff from RAN Army and RAAF, making us a truly Joint and Multinational organisation. CAPT Natsen Sawasi, our Papua New Guinea Defence Force seconded officer, planned and delivered an exported version of the Regimental Officer Basic Course in Lae, Papua New Guinea. Conducted in conjunction with 3 CER’s ExERCISE PUK PUK, the course was just the second of its kind in 32 years and has enhanced the military engineering capability of our closest neighbour.

This year’s Corps Conference, *SAPPER 2019*, was our first conference under the leadership of our new Head of Corps, BRIG John Carey, CSC. *SAPPER 2019* had a very broad representation from across the Corps, from CPL to BRIG. It featured insightful presentations and guidance

from across Army and Industry on topics such as: Army in Motion by the CA; Accelerated Warfare by DG FLW; Training and Education – Training Transformation by DG Five working groups discussed potential solutions to problems faced by the Corps in our future missions and roles, accessions, training and education, employment and retention, and strategic communications. The outcomes of these working groups were distilled into a series of Briefs which have already been instrumental in building and enhancing the future of our Corps.

During the months of July and August SME oversaw the RAE Capability Establishment Review (CER) of all RAE units (less SOER), which was a challenging but rewarding undertaking, however, overall I assess we fared well and have set the conditions for the future. Leveraging off the outcomes of *SAPPER 2019*, our focus was to review the current Unit Establishments against Directed Training Requirements, Directed Outputs and Modernisation Efforts, including; CBRN, armoured engineering, replacement C and D vehicle fleets and regional engagement across the Indo-Pacific to name just a few of the lines of effort across the Corps. Significant challenges to this review included the strict establishment cap, hollowness across the construction trades, and the Combat Engineer shortfalls within the Combat Brigades. Despite these challenges, the CER was a success, verifying our ability to be ready now under current Unit Establishments, and proposing innovative solutions to ensure we are future ready including use of the Total Workforce System and the future employment of the Specialist Officer/NCO.

To wrap up what has been another great year SME took time out to recognise and celebrate its 80th year of being permanently established in the Liverpool District. SME was established on a permanent basis on 26 September 1939 in the Liverpool District from where it has generated many fine Sappers and contributed to the Corps’ modernisation efforts. To mark this significant milestone SME conducted a ceremonial parade, hosted the inaugural Corps Sapper Competition, Ex STEELE CUP, and combined the annual Corps Dinner with a unit ball to cap off the week of celebrations.

Finally, as the outgoing CO/CI SME would like to take this opportunity to thank all who have contributed so much throughout my Command Tenure, it has been an honour and a privilege to serve with so many

professional and passionate individuals, that tirelessly contribute so much to the Corps on an ongoing basis. I wish LTCOL Brad Heskett and WO1 Tony Luchterhand (2020 Command Team) all the very best as they continue to deliver on the SME mission and ensure that the Corps remains in good order for the future.

Specialist Engineering Wing

MAJ Ricky Schmidt

Explosive Detection Dog Cell

2019 for the EDD Cell commenced on the 29 Jan with the EDD Section Commanders Course. The five handlers undergoing the required training provided trainer support to the sections within the corps. With canines sourced from Australia and New Zealand, the teams developed our capability, improved their understanding of training and learned additional training techniques. Taronga Zoo, NSW Police and Guide Dogs provided an insight to external animal training and helped with ensuring the successful certification of 16 EDDs to provide support to Army and RAAF capabilities.

The Basic Dog handlers course commenced mid-year with six members from the CERs and 2 RAAF members working together to meet Defence requirements to become operational members of a high risk search team. The teamwork between Army and RAAF helped with understanding operational and tactical environments, enhancing the esprit de corps between them. The completion of 'Mad Bomber' (Level 2 assessment) ensured all trainees had successfully completed the requirements to move forward into operational roles.

With the contribution of a training and development section the kennels has had a constant flow of recruit training dogs ensuring that the future Section Commander and Handlers course have the best possible EDD's, and the best capability for the future. This section as well as the main headquarters has renamed the acronym of EDD to "Engineer Demonstration Dogs" as throughout the year we have provided capability demonstrations to a myriad of inter-agency organizations and courses. These have been instrumental in shining a light on the importance of EDD and Engineers within Defence.

Force Protection Cell

When operating within a complex threat environment, a Combat Engineer's primary role will often be the provision of mobility support to its supported FE. In order to provide an effective level of capability in support

Trainees conducting route clearance across a water course.



of the Ready Combat Brigades, we as Sappers must ensure we have the skills and knowledge to safely move forward, locate and reduce the threat in order to clear the way, while often operating under significant pressure.

This year the Force Protection Cell within the Specialist Engineering Wing has made significant progress toward modernising the training continuum across all ranks and levels. This has included reviewing search procedures including the Route Clearance Capability, a review and update of all Mine Warfare procedures. Concurrently, the FP Cell has also conducted a full analysis and re-design of the EHR continuum, to increase the scope of capability provided by a CE when operating in an explosive hazard threat environment. All course redesigns and LMP amendments are submitted. These changes will also be supported by a full re-write of the LWP-G 3-6-5 Mines, Booby Traps and IED Doctrine which is due for completion in 2020, which is a credit to the CPL's and SGT's within the team for their tireless efforts for the benefit of the RAE.

Watermanship and Bridging Cell.

WAB introduced the Dry Support Bridge (DSB) course this year. The year started off with the handover of the two DSB sets from Project Land 155 to SME and review of the LMPs to support the Introduction into Service training. The DSB Launcher brought its own set of problems, with maintenance and road permits, as this is a 45 tonne vehicle.

In successfully completing three DSB courses this year, the WAB Cell has had to overcome many hurdles,



*Top. Light Urban Explosive Breaching Facility;
Left. Air Boss Low Burden Mask
Above: Trialing new L2110 equipment*

particularly with the amount of pre-requisite licences and training required for the different DSB positions. These pre-requisites include a myriad of Army training requirements as well as civilian High Risk Work Licences.

Demolitions Cell

Along with the usual Demolitions Supervisor stand alone, ROBC, Corporal and Sergeant promotion courses, the Demolitions Cell have been developing the new Holsworthy Urban Breaching Range, to be constructed IVO the Demolitions One range on Holsworthy Barracks by March 2020. This will see courses from IET’s to ROBC trained intensively in Light Urban Explosive Breaching to further build capability within the Corps and in the battle group environment.

CBRND Cell

Project Land 2110 Phase 1B

In 2017 the Vice Chief of the Defence Force (VCDF) released a Joint Capability Directive regarding the remediation of the ADF CBRND capability. Subsequently Project L2110 and relevant contracts were established

to ensure that the ADF is well trained and equipped to meet emerging and ever evolving CBRN threats.

This year, CBRND have been incorporating the new state of the art equipment into the current training continuum and designing the future training concept.

Included in the new equipment into service with L2110 is the Air Boss Low Burden Mask. The Low Burden Mask is the new in service Air-Purifying Respirator. It features a wider field of view and the capability to operate with one or two canisters simultaneously.



Top left to right: IET Course 0095 conducting training throughout the duration of the course; combat shooting training.



Troops transition to the newly introduced Range Practice (RP) shooting continuum, which has replaced the legacy Live Fire (LF) shooting continuum at Kapooka. The result being that Sappers are trained with the most up to date training and knowledge to a standard that allows them to enable the joint force to live, move and fight.

During 2019, the delivery of the ROBC was focussed toward training the RAE Lieutenants' teamwork and task supervisor responsibilities, rather than individual skills. Throughout the course, the Lieutenants demonstrated a good understanding of doctrinal processes quickly which allowed the instructors to delve into more contemporary examples of military engineering. The course continues to evolve to remain relevant for today's contemporary operating environment. Major changes saw the shift from the outdated training adversary; the Musorian Armed Forces (MAF) to the Decisive Action Training Environment (DATE). DATE is a training adversary system developed by the US Military and in use by the US, UK, Canada and Australia. The adoption of a common training environment will assist in interoperability with our major coalition partners. The ROBC culminated in a 20 day field exercise where the Lieutenants were exposed to engineering and friendly force capability; solving problems in a security and stability operating environment and practicing the skills taught on the course. Post the course, there is significant effort being applied to modernise the course to better prepare the Lieutenants for employment in the Combat and Support Engineer Regiments.

As 2019 rounds out, CEW will continue to develop into the future, with a focus on training Sapper's of all ranks to meet the requirements of the current and future warfighting environment. CEW maintains a reliance on the feedback of units in order to ensure the outputs meet the requirements of our deployable units.

Combat Engineer Wing

LT Claye Willcox

2019 has seen the Combat Engineer Wing (CEW) continue its high tempo pace, conducting over 13 courses and successfully training over 300 members; ranging from the rank of SPR to CAPT.

CEW continues to maintain its international perspective, hosting trainees from several international military communities, including the New Zealand Defence Force, Malaysian Armed Forces, Armed Forces of the Philippines, Republic of Fiji Military Forces, Indonesian National Armed Forces and Papua New Guinean Defence Force members partaking in the Regimental Officer's Basic Course (ROBC). The Wing is also host to an ongoing exchange for one of three Initial Employment Training (IET) Troop Commander positions; filled by a Papua New Guinean Army Engineer Captain.

Throughout the training year the ARA and ARes RAE IET has been under continued development, with a major focus on producing Sapper's who leave SME with the tools to be able to support the combined arms team. IET Troops have continued to advance foundation warfighting skills; developing their skills in urban operations and combat shooting to enable Sappers to participate in urban operations alongside other arms corps in their primary and secondary roles. IET courses have also begun introducing Sappers to the newest equipment that RAE has to offer; with the introduction of specialised chemical detectors, to qualifications on the Improved Ribbon Bridge (IRB). This year has also seen the IET

Construction Wing

MAJ Kevin Hamilton

Construction Wing (CW) has seen a significant increase in both the number of construction promotion courses it delivers as well as the construction engineer focused continuation training courses it has developed and supported throughout 2019. This combined with efforts to invigorate the construction space in support of developing ADF requirements throughout the South Pacific have enabled CW to be at the forefront of training development. Whilst CW continued to deliver the regular suite of RAE and RAAF Airfield Engineer (AFENG) DTR courses, it also saw the delivery of support to a number of ADF Exercises including Ex HARI'I HAMUTUK in Timor-Leste and Ex PUK PUK 19 in Papua New Guinea. This year also provided the opportunity for CW to take ownership of the conduct of trade assessments across the spectrum of construction trades, this in turn has streamlined the integration of previously qualified tradesmen into construction roles.

Trade Training Troop (TTTp) saw a shift in the number of sessions it manages with the number increasing to 8 sessions between the three trades (Carpentry, Electrician and Plumbing Sections) running concurrently. TTTp has seen an increase in the number of trainees conducting On the Job Training (OJT) with the troop swelling to 87 trainees trained by both uniformed ADF Instructors as well as Civilian Building Trade Experts (BTE's). This number is expected to increase in coming years with enrolled numbers expected to almost double in order to meet ADF construction requirements. TTTp also saw the first trial of the construction trade assessment process that saw two trainees have their civilian Cert III qualifications recognised, complete identified gap training, before posting to 6 ESR.

Civil Construction Troop (CTTp) has continued to support the ADF through the delivery of two Civil Construction Plant Courses (CCPC) with a total of 28 trainees including four RAAF Plant Operators. CTTp also supported the delivery of three C6 Crane Courses throughout the year as well as beginning to develop an online learning environment in order to support 'blended' course delivery. CTTp is currently planning for an increased DTR on the CCPC for 2020.

Construction Management Troop (CMTp) has delivered a significant number of courses throughout the year including delivery of the AFENG Officer and NCO training continuum. CMTp delivered the following Construction promotion courses including but not limited to: WEFPEC, RAE ROBC Module 2, AFENG Basic Course, Subject 4 Construction (Core) for CPL to SGT as well as the

Subject 4 WO2 and WO1 Construction Management Course. This combined with newly forged partnership with Engineer Education Australia has enabled CMTp to ensure its training remains relevant and effective.

Overall 2019 has been a high tempo, high output year for CW. The training the wing has conducted has enabled a range of Construction Engineer skills to be refined across both RAE and RAAF AFENG construction training continuum.

Civil Training Troop.

LT Jessyk Ernst

Civil Training troop (CTTP) has maintained its high tempo of course delivery this year. We continue to evolve our existing courses and through the initiative of instructors, develop and modernise our course delivery. CTTP has seen the delivery of two Civil Construction Plant Courses, these courses see members qualified to operate a number of heavy plant vehicles from dozers and Excavators, to Loaders and Backhoes. This has resulted in adding a further 27 Plant Operators to the ADF construction capability. All training provided is in line with industry standards and gives the trainees the skills to employ their trade in any environment.

CTTP has contributed to the training of students as part of the 60T Crane Course as well as providing Civil Training to various promotion courses including SUBJ 4 CPL, SGT and incoming RAE officers as part of the ROBC. The troop has also remained involved with Project LAND 8120, providing the procurement team with a capability display and feedback in addition to supporting the LAND 8120 Tender Evaluation Board.

The Troop has continued to work extremely hard to deliver leading edge training throughout the training calendar. This is a testament to our dedication to the technical development of the trainees themselves and our commitment to developing the ADF's horizontal construction capability.

Trade Training Troop.

LT Chase Batten-Smith

Trade Training Troop (TTTp) has continued its work building the ADF Construction Trade capability in 2019. With the ongoing requirement to provide Construction Engineers across the vertical and services construction space. TTTp has seen it size swell to over 87 trainees supported by 10 trade supervisors. This has been a direct reflection of the ADF effort to grow its construction



capability. Trade Trainees continued to work hand in hand with civilian Building Trade Experts to learn and develop their individual trade skills and fulfil their competency requirements. This trade training has been reinforced with RAE and All Corps continuation training during allocated training days throughout the year. These skills were then tested during the annual troop field training exercise Ex TRADIE ASSAULT 19 which saw 65 staff and trainees deploy to Majura Training Area to conduct a range of troop and section level tactical task over a 10 day period.

Concurrently, trainees from TTTp were given the opportunity to support Ex HARI'I HAMUTUK in Timor Leste and Ex PUK PUK 19 in Papua New Guinea. This enabled trainees to employ their trade skills across a variety of work sites whilst also engaging with the supported local populace. These exercises are key in introducing trainees to defence construction in arduous conditions to prepare them for work in ADF Construction.

In all, TTTp has had a very successful year training the future ADF construction capability. By the end of 2019, TTTp will have qualified and marched out a total of 7 Electricians, 7 Plumbers and 10 Carpenters including 2 RPL trainees who undertook the trial RPL package in recognition of their previous trade qualification.

Construction Management Troop

FLTLT Mitch Heming

Airfield Engineering

Since its consolidation in 2016, SME has continued to deliver a premier joint-training environment for RAAF Airfield Engineering training. The AFENG Officer training continuum was delivered to nine trainees including the first international trainee. All completed the required components of the AFENG Training Continuum consisting of Airworthiness course, Airfield Survey, in addition construction and project management training on the SUBJ 4 WO2 Course.

The trainees also complete the Weapons Effects and Force Protection Engineering Course (WEFPEC). This course is open to all ADF Technical Engineers both officer and works supervisors. The course provides trainees with an in depth understanding of blast and ballistic effects on structures, how to assess structural damage and design passive FPE measures to reduce risk to ADF personnel on operations.

Construction Wing continued to facilitate initial employment training for both AFENG Plant Operators and Tradesmen with four plant operators successfully completing the CCPC course. AFENG personnel have attended all SUBJ4

promotion courses throughout 2019, allowing them to build and maintain networks with their Army peers and ensuring a standardised construction training continuum between RAAF and Army.

ROBC MOD 2

The ROBC's Module 2 (Construction) was delivered by the wing to 40 trainees through the period 25 Feb – 22 Mar 19. The module focused on Construction Management for TP Commanders and Flying Officer Trainees, who learned the theory of civil and structural engineering and how best to manage construction operations in a military context.

The trainees conducted a range of practical construction training including surveying tasks, concreting, and gained an understanding of plant capability. Trainees were assessed on their ability to conduct route reconnaissance and repair planning, camp design and the planning for FPE measures. The conclusion of the module involved a NSW RMS site visit to compare and associate the civilian equivalent of construction management.

Trainees were able to implement the theory lessons from construction module on Exercise Kokoda where trainees designed, planned, constructed and operated from a Forward Operating Base.

SUBJ 4 CPL RAE CON CORE

Construction Management Troop managed and delivered three CPL courses throughout the year, graduating 30 trainees. The trainees will fill appointments as Construction Site Foreman. As foreman they will be responsible for controlling and managing aspects of both vertical and horizontal sites by providing technical and trade specific advice, managing time and delivery schedules, and quality control and assurance.

The CPL Course training provides the underpinning knowledge of construction site management and trade specific considerations required for graduates to perform the duties of a construction foreman. It enables them to effectively and efficiently managing a section of composite tradesmen within their units.

SUBJ 4 SGT RAE CON CORE

Construction Management Troop ran two SUBJ 4 SGT CORE Courses through 2019. Graduating a total of 18 trainees. The course provides up to date knowledge and skills for members to be employed as Construction Works Supervisors. The course is mostly theory based and delivered in a classroom environment.

The course introduces trainees to larger scale Engineer Operations and Non-Equipment Bridging, aligning training to RAE Combat Engineer promotion courses. Additionally, trainees learn the fundamentals of construction work procedures and processes and further develop their knowledge of WHS requirements on construction sites. Graduates will perform construction supervisor duties within their workplace as Troop Sergeants and will be responsible for managing and controlling both quality and safety on their sites.

SUBJ 4 WO2 and WO1

CW conducted two SUBJ4 WO2 and one WO1 course in 2019. These courses are a blended method of delivery combining an online pre and post course components with a residential phase. The courses are provided by a civilian RTO, combining instruction from both civilian and military instructors. This provides industry standard project management knowledge with a military context. In addition to being the culminating courses for work supervisors and works managers, these courses also form part of the AFENG Officer training continuum, with the WO2 course being provided during IET training and AFENG officers returning at FLTLT to complete the WO1 course.

Littoral and Riverine Survey Squadron

CAPT Dylan Storrie

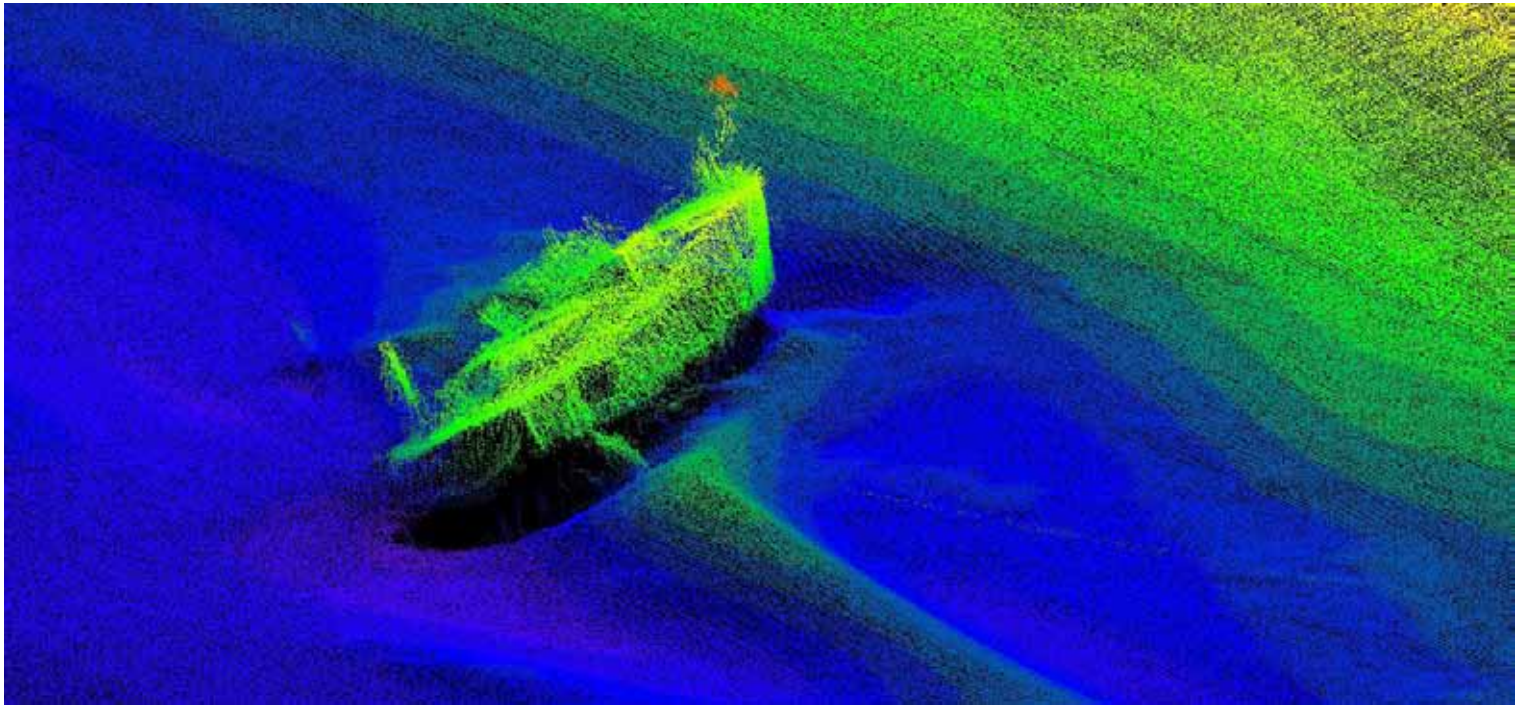
2019 has seen Littoral and Riverine Survey Squadron (LRSS) excel in three key areas;

- Innovation through significant technological and methodological developments made to the way LRSS conducts littoral remote sensing;
- Significant structural change that will enable the Squadron to increase its operational output and its ability to support Army's littoral and geospatial intelligence needs; and
- The deployment of two members, one on OP Highroad and one on OP Southern Discovery.

New Technology

The main effort of LRSS' technological development this year has been the introduction into service of a suite of sensors that are set to significantly contribute to Army's geospatial intelligence collection capacity.

The systems, which incorporate a diverse range of mobile LiDAR and multi beam echosounder sensors, create 3D images simultaneously of land and sea surfaces. This approach to collecting



geospatial data will assist commanders to develop an exceptionally detailed understanding of the operating environment thereby enabling commanders to conduct a greater level of risk analysis and mitigation during the planning phase of operations.

This data collected can be refined into a 3D model of a maritime installation such as a wharf or a beach landing zone. The model can then be employed in the development of mapping, obstacle identification, mission rehearsal exercises and infrastructure viability analysis.

Of note, similar sensors have also successfully been employed on an Unmanned Surface Vessel (USV). Due to its discrete size and profile, the USV is capable of maintaining a low physical signature, allowing it to remain under the detection threshold whilst providing real time geospatial intelligence.

Australia, as our national anthem so eloquently states 'is girt by sea', with approximately 34,000 Kilometres of coastline and over 1,000 significant estuary systems. As such, we are likely to rely upon littoral and riverine manoeuvre to an increasing extent. The ability to conduct detailed modelling of this littoral environment is set to enable regional ADF operations into the future.

Several capability development activities funded by Army Headquarters have been conducted by LRSS. This development has largely been enabled by the knowledge and civilian expertise that LRSS' part-time members bring to Army. This demonstrates the successful outcomes of enabling the promotion of a grassroots innovation culture across the command.

New Structure

LRSS has a long historical legacy of moving throughout the command of RAE units. Whilst this has presented many unique opportunities, it has often resulted in the SQN missing the opportunity to update its structure to best serve the force. This year, LRSS was included in the RAE Capability Establishment Review and was successful in growing and diversifying the establishment. The growth came through the addition of 20 new positions and the diversification came through the broadening of skills by the addition of employment categories including surveyors, geospatial technicians and support elements.

These additional positions allow LRSS to seek out more part time members with specialist skills in land survey, hydrographic survey, remote sensing and hydrographic systems. With the development of new positions comes a new challenge, that being finding technically minded people who are interested in managing cutting edge technology in order to support the ADF's geospatial intelligence requirements.

Operations

LRSS had the privilege of deploying two members. One was allocated to Operation Highroad and the other to Operation Southern Discovery to assist the Australian Antarctic Division with survey activities over the summer period.

Support to Australian Army Cadets and Australian Antarctic Division

In addition to the core role that LRSS provides, the Squadron played a key part in the NSW Australian Army Cadets Brigade (NSW AAC BDE) Annual Field

Exercise. Members of 5ER and LRSS came together to provide Army Cadets from all over NSW with an exhilarating watermanship activity that was an excellent development opportunity for all involved.

Conclusion

LRSS has had another busy year with a focus on developing and introducing new remote survey technology and cutting edge techniques to maximise this winning edge. With more positions and further opportunities to support both domestic and international operations, LRSS remains poised for another exciting year in 2020.

Trainee Rehabilitation Wing

LT M Peek

The Trainee Rehabilitation Wing (TRW) facilitates the rehabilitation of all-corps Initial Employment Trainees suffering musculoskeletal injuries from every Training Establishment in Army. In 2019 it expanded its support to encompass the rehabilitation requirements of Direct Entry candidates under Special Operations Training and Education Centre (SOTEC).

Formed in 2003, the first TRW was located at the old School of Military Engineering (SME) in Moorebank and was lucky enough to be upgraded with the SME move to Holsworthy. In 2011 a specially designed, \$26 million facility was built adjacent to the Holsworthy Health Centre (HHC).

With a combination of daily physiotherapy classes, multiple PT and military lessons daily along with psychosocial activities, TRW seeks to balance physical and mental wellbeing of trainees. Previous staff experience has identified those suffering from physical injury are commonly impacted by a subsequent mental injury. This stemmed from trainees worrying about their speed of rehabilitation, if they would be medically discharged, if they could afford to support their family while remaining a trainee or even disappointment in being left behind their peers.

To combat this TRW implemented a number of psychosocial activities ranging from monthly excursions to significant local sites, research papers and presentations, 'learning to serve' activities like volunteering at the Sydney Dogs and Cats Home animal shelter or Riding for Disabled. These activities are designed to focus trainees on the bigger picture, their

life and how having an injury isn't something to have tunnel vision for. Within the physical restrictions placed on them, trainees are often able to support local Units and the wider community for tasks such as Catafalque parties, support Legacy collections and various role player duties. TRW aims to ensure rehabilitating trainees are occupied and invested-in as an Army asset while conducting their rehabilitation program.

2019 has been a busy year as TRW has implemented a number of initiatives including nutrition packages presented by civilian experts, performance psychology workshops and functional movement screens to identify mobility vulnerabilities and prevent future injuries.

TRW will see a significant turnover of staff at the end of 2019 and look forward to increasing knowledge of proper training techniques, pre-rehabilitation and refinement of trainee rehabilitation with the new all-Corps team in 2020.

Left page: Image of a sunken vessel located in the George's River employing LiDAR and multi beam echosounder sensors

Below: Members of TRW undertaking PESA training as part of their rehabilitation.



School of Military Engineering

80th birthday parade, 3 November 2019





[Sapper SITREP]

1st Combat Engineer Regiment

LTCOL Scott Jamieson

In 2019, 1 CER prepared for known and contingency operations through the Joint Warfighter Series of exercises and a raft of International Engagement activities. As always, Sappers were spread thin through every training activity and battle, providing Engineering support to enable the Joint Force to live, move, fight and win.

Now part of the READY Brigade, 1 CER is poised to support the Australian community or our friends in the near region - in case of a natural disaster, or any other contingency operation in support of the Nation. This is our greatest responsibility and the focus of all our efforts. Some of us will be required to remain READY through the holidays this year, and some during their move South on posting. To all the members of the Regiment, I thank you all for your vigilance and effort in preparing as part of the Nation's READY response options.

As always in Army, the Regiment's capability is underpinned by excellent people and the support of our families, friends, and community. To all who support the Regiment and its people, I thank you for all that you do.

Ubique

Regimental Headquarters

CAPT David Ferwerda and CAPT Jarrod Johnson

The year began with RHQ-coordinated mandatory training on Ex GOANNA READY and Ex GOANNA SPANNER. In late March Tropical Cyclone (TC) Trevor arrived and the Regiment stood up the Joint Task Force 631 on behalf of the 1st Brigade to provide support to the Northern Territory (NT) Government and communities affected by the cyclone. The Regiment was instrumental in planning and executing the evacuation of civilians from Groote Eylandt and surrounding communities in the path of TC TREVOR. The evacuation proved to be the largest civilian evacuation conducted within the NT in recent years. Along with attachments from the RAAF and other 1st Brigade Units, the JTF faced a further challenge with a second TC (TC Veronica) developing on the west coast making landfall near Port Hedland. Both cyclones provided an excellent callout activity for the Emergency Support Force (ESF), opportunity to support both the NT Government and civil community and prepare the Brigade for the READY year ahead.



CO 1 CER delivers orders in Shoalwater Bay

The Regiment participated in various exercises across Australia culminating in Ex TALISAMN SABRE (Ex TS) at Shoalwater Bay. On Ex TS the Regiment provided engineer planning and reconnaissance to the Brigade and combat engineer support to multiple Battlegroups. The exercise proved a worthy training ground to train and test the Regiment's combat engineer and planning capabilities.

The Regiment's admin and support teams have supported the Regiment and their families throughout the year. The Regiment held a successful Family Day at the Unit in March to welcome new families to Darwin and promote the Regiment in the Brigade and wider community. The Welfare Team also held a number of events for families and friends remaining in Darwin whilst the majority of the Regiment was deployed on Ex TS. A very successful Great Gatsby themed ball was held at the end September to celebrate the Regiment's achievements prior to assuming the READY year.

The Regiment Signals Section (RSS) provides critical communications capability to RHQ command teams. The Regiment operates across a dislocated and dispersed battlespace and gaining and maintaining communications is vital to mission success. The RSS continues to revitalise the capability in 2019 completing a number of communications courses to provide formal and in-depth training on the in-service radio suite and manage COMSEC material.

1 CER's Regimental Reconnaissance Detachment (RRD) has had a busy 2019 that has seen significant changes to the role of engineer reconnaissance within 1 BDE. RRD successfully demonstrated its capabilities throughout the Reading series of exercises in 2019, cementing its reputation as a critical asset within 1 BDE. Further to the FORCEGEN commitments, RRD has represented 1 CER at AASAM, assisted with Cyclone Trevor, worked in conjunction with formation reconnaissance across the Warfighter certification series and worked with NORFORCE on projects in the top end.

RRD's main role in the JWS series was to set the conditions for follow on forces to maintain momentum in the offence. With this in mind, our focus was to assist in identifying (and if required make) mobility corridors for 1 BDE manoeuvre forces to support their advance. Through integration with other 1 BDE formation reconnaissance assets, RRD enabled subsequent shaping actions and enhanced 1 BDE's advance through SWBTA. An example of RRD's achievements was during Ex PRED RUN (BG LION's WFX) when RRD undertook watermanship reconnaissance which subsequently led to an infantry company (+) water insertion down SWBTA's coast.



RRD member preparing to launch a Black Hornet

Further to this, we were heavily employed in a CTR role which greatly enhanced obstacle (natural and man-made) intelligence in the battlespace. RRDs actions were pivotal in enabling manoeuvre forces to maintain momentum.

Throughout the year RRD personnel have performed to a high standard in both kinetic and non-kinetic exercises and operations. The team have worked hard to reach their current standard and are on standby ready for high risk weather season in the top end and any other operational obligations.

1st Field Squadron

SGT Scott Stanley

The start of 2019 was busy, as always. Once induction was complete, the Squadron had its first hit out during Ex GOANNA WALK, a foundation team skills activity at Kangaroo Flats Training Area. The focus was on live demolitions, obstacle reduction and minor team tactics. This activity was wrapped up more prematurely than expected - tasked with ESF duties over the high risk weather season, the squadron quickly reacted to Tropical Cyclone's Veronica and Trevor, which threatened the top end with highly destructive winds offshore as Cat 4 cyclones. Their ferocity waned on making landfall, and the ESF was not required to deploy further afield than Darwin, and assisted local emergency services with accommodating over five thousand individuals and families displaced by the event.



Live fire explosive breaching at Mount Bundy

Once the Squadron's commitment to ESF was concluded, the Squadron switched its focus to Ex GOANNA RUN 2019, which was conducted at the Mount Bundy Training Area (MBTA). The Squadron conducted two full mission profile activities, focussed on bridging by night with MGB as part of a simulated brigade advance, and an obstacle breaching activity as part of a simulated battle group assault. This activity enabled 1 Field Squadron to achieve its core METLs prior to Ex Talisman Sabre 2019 (Ex TS).

Over the month of July, the Squadron integrated with Combat Team's Bravo and Charlie from 5 RAR and provided Mobility and Survivability support for the Ex TS to great effect. It was a unique opportunity for the newer members of the squadron to work with other units and gain a better appreciation of how the Squadron operates with larger combat teams and battle groups. Key activities during this exercise were 1 Troop's clearance of thirteen complex obstacles on a mounted avenue of approach down the east coast of the training area. Concurrent to this was a riverine insertion of a company of infantry and ISR over a period of three nights by 2 Troop. The activity was very successful, and enabled a wide range of engineer tasks to be completed in a short period of time.

Aside from major exercises, 1 Field Squadron also conducted a wide range of Brigade support tasks in 2019 which include the CBRN Remediation training packages, as well as AFA and vehicle qualification

courses. The Squadron is now trained in the light decontamination system and this has greatly enhanced the Brigade and Regiment's CBRND capability. The squadron holds the Australian Protective Route Clearance Capability (APRCC) and has conducted a variety of mounted search operations for the regiment and brigade, most notably during Ex TALISMAN SABRE 19. The squadron has also enhanced capability by incorporating UAS into search-related operations, conducting an AHQ trial to integrate UAS into high risk search teams. The feedback was positive, and search commanders found they were able to increase their situational awareness significantly by having the asset available at the lowest levels.

1st Field Squadron has championed the Regiment's efforts to integrate the Marine Rotational Force Darwin (MRF-D) throughout 2019. MRF-D personnel have been integrated into the majority of Squadron exercises, participated in the unit ANZAC Day celebrations and participated in unit sports. This has allowed greater exposure to different training techniques, as well as developing strong friendships.

This year has also seen a significant increase in international engagement activities which have allowed the Squadron to support exercises in Indonesia, the USA, and East Timor. This exposure of integrating with other international forces has enhanced the squadron and provided valuable training for 1 Field Squadron members.

It has been a busy but rewarding year for the Squadron; we are now READY to respond to contingencies whenever and wherever they arise.

9th Field Squadron (Mechanised)

LT Douglas Stewart

2019 saw the 9th Field Squadron (Mechanised) postured to resume three major responsibilities on behalf of the 1st Combat Regiment; mechanisation of the Squadron; certification as the Engineer Squadron to the Ready Battle Group, and Engineer Support to the Ground Combat Element of the Amphibious Task Group. This was achieved with the Squadron minus providing support to the Ground Combat Element in the amphibious operating environment, and 4 Troop directly supporting the 1st Armoured Regiment.

As part of preparation for amphibious operations the squadron spent time at the beginning of the year conducting individual readiness serials. Primarily Helicopter Underwater Escape Training, which was a critical enabler for Three Troop who were posturing to conduct airmobile operations from HMAS Adelaide. On completion of individual readiness requirements Troop and Squadron Headquarter elements moved to Adelaide to partake in a series of simulation exercises to rehearse planning iterations and build relationships with the supported element. The simulation lead straight into Ex PANTHER WALK.

Ex PANTHER WALK was a Squadron tactical field exercise running concurrently to the 7th Royal Australian Regiment's activity Ex BOAR's WALK. The exercise facilitated the Troops to rehearse their standing operating procedures, with a focus on mechanised breaching.

It also allowed Troops to strengthen the relationships with supported Combat Teams. Ex PANTHER WALK culminated with a live fire breach of a tactical obstacle, with Sappers employing Bangalore torpedos in order to create lanes for Battle Group BOAR's M113AS4s.

On return to Darwin in April the Squadron continued rehearsing mobility and counter mobility tasks in preparation for the upcoming major exercise period. These rehearsals included Troops effectively employing the Double-Story Medium Girder Bridge. After successfully achieving the objectives set for the first quarter of the year the Squadron celebrated ANZAC day and enjoyed a well-deserved respite.

In lead up to SEA SERIES and Ex TALISMAN SABRE the Squadron Headquarters conducted simulated planning iterations on-board the LHD, HMAS Adelaide. While Four Troop deployed to Shoal Water Bay Training Area early to conduct the Brigade War fighter Exercise with Battle Group Lion. Four Troop helped achieve surprise for COMD BG LION by conducting a small boat infiltration utilising Shoal Water riverine systems to lodge behind enemy defensive positions. During this time the Squadron main with Three and Five Troop embarked the HMAS Adelaide to conduct Sea Series. This involved rehearsals of amphibious lodgements by both surface and air connectors; and culminated in Ex SEA RAIDER where the Ready Battle Group conducted Stabilisation tasks in Ingham, leading into Ex TALSIMAN SABRE

E21 construction of a medium girder bridge





SPR Tighe conducts HRS in the Urban Operations Training Facility (UOTF) on Ex TALISMAN SABRE

The Squadron conducted a successful amphibious lodgement of Mechanised vehicles into Shoalwater Bay to begin Ex TALISMAN SABRE and quickly transitioned from part of the Amphibious Task Group to the 1st Brigade. Ex TALISMAN SABRE saw the Squadron provide mobility support to Battle Group BOAR by providing route reconnaissance, breaching tactical obstacles; and breaching protective obstacles in the urban environment as part of the final clearance of Raspberry Creek UOTF. On return from North Queensland the Squadron postured to fulfil the responsibility of the Ready Engineer Squadron from 1st of October. 9 Field Squadron has had a very successful and busy year, consistently fulfilling all requirements with the attitude and behaviour that has come to be synonymous with the Australian Army Sapper.

23rd Support Squadron

CAPT Augustus Hortle

The readying year for 23 Spt Sqn saw the validation of the investment into individual and collective qualifications from the previous two years. The continued implementation of plan Keogh, introduction of new L121 vehicles and the various trailers and the realisation of the DSB capability balanced against Emergency Responses Troops critical and ongoing support to the 1st Aviation Regiment and standing international engagement activities made for an interesting and fast paced year for the squadron.

The squadron invested significant effort into ensuring the team was postured for the readying year, including Exercise Talisman Sabre domestically and Exercise Hari'i Hamutuk internationally.

Goanna Walk saw 23 deploy as a squadron in a tactical setting for the first time in over a year. The experience of a field phase at KFTA in early March will most likely leave mental scars with the new march-ins for a few wet seasons. One noteworthy performance was SPR McAnulty's cowboy walk in an attempt to ease his truly epic chafe.

23 Spt Sqn achieved major mile stones as a part of Ex GOANNA RUN, with the DSB employed in its first Full Mission Profile (FMP) with the 1st Field Squadron; DSB training culminated with a tactical night build. The section broke new ground employing their new L121 vehicles in a tactical setting while also achieving their core mission set





International Engagement on Ex Hari'i Hamutuk in Timor Leste

on a virgin site in excellent time. Not to be outdone the WPDS section established an effective tactical water point whilst integrating key ARES personnel from our friends at 3 Fd Sqn. Emergency response troop deployed with CSSB as part of the Brigade Support Group (BSG) and formed a critical component of the Battlefield Clearance Team. This early integration paid dividends on Talisman Sabre 19 as the key connections had been made to allow the troop to assimilate easily into the BSG. Plant sections were employed to complete a series of mobility tasks in support of keeping the battle space open to friendly forces, they were constrained by the tactical manner in which they were employed and as always had to deal with the friction of operating heavy machinery in a tactical setting.

During Ex TALISAM SABRE 19, 23 Spt Sqn capitalised on the fluid and rapid nature of modern warfare. The lessons learnt on Goanna Run were carried forward and allowed the BSG to achieve greater levels of survivability and flexibility in their employment. The DSB was employed in a FMP to enable the BSG to step forward, whilst plant were constantly on the move providing the required level of survivability to supported elements. The hard won lessons from Goanna Run for ER were capitalised on and they fully integrated into the BSG to support several BCTs throughout the exercise. 23 Spt Sqn was able to rapidly integrate with Battle Group Black as part of the exercise which saw the Route Clearance Package and NZ Engineers conducting joint route search ISO BSG mobility.

Exercise Hari'i Hamutuk

The Squadron once more led Ex Hari'i Hamutuk in Timor-Leste over 12 Aug – 23 Sep 19. Joined by military engineers from Japan, Timor-Leste and the United States, 1 CER personnel conducted base maintenance and engineer training serials.

At 210 participants, Ex HH 19 was the largest to date and was a particularly exciting iteration of the exercise, with a focus on interoperability. The F-FDTL displayed increased leadership and investment to the exercise, commanding one of the five multi-lateral Troops and running three of the seven construction tasks.

Coinciding with the 20th anniversary of Timorese independence and the INTERFET mission, appreciation of the history and culture of Timor-Leste was a feature, with participants conducting visits to Timorese museums and



23 Spt Sqn - Construction of DSB on Ex TALISMAN SABRE

a battlefield hike retracing steps taken by the Australian 2nd/2nd Independent Company during WWII.

The readying year was a challenging and rewarding year for 23 Spt Sqn multiple field phases and complex International Engagement activities strained the squadron and led to some very effective training.

Operational Support Squadron

LT James Maclean

Throughout 2019 the Operational Support Squadron (OSS) has focused on developing the capability and institutional knowledge necessary to enable the provision of logistic support to meet the requirements of 1 CER in both traditional and contemporary operational environments. Over the last few years, PLAN KEOGH has seen the number of personnel in OSS reduced by half; the ORBAT changes include a significant reduction in the number of WOs and SNCOs which have led to new and challenging constraints for OSS to overcome to effectively support dependencies and achieve the Commander's Intent.

Three key activities were conducted in 2019 to prepare OSS during the Readying Phase; these were Goanna Walk, Goanna Run and Exercise Talisman Sabre (Ex TS).

Goanna Walk, conducted in March, was a two week activity consisting of troop and SQN level logistic support activities in both the barracks and field environments. The intent of this activity was to conduct a shake out with the end state having established baselines for field craft at the individual, troop and squadron level in order to posture OSS for future operations and identify deficiencies and areas for improvement, including SOPs.

Goanna Run, conducted in May, was a two week field exercise conducted in the Mount Bundy training area. OSS deployed in support of 1 CER complete, with the intent to determine its capability and capacity limitations in terms of logistic provision in support of a Regiment sized unit; further refinement of SOPs; integration into the BSG and integration into 1 CER. It was identified that when supporting and nesting with two superior headquarters OSS's ability to provide logistic support quickly culminated. This prompted the refinement of SOPs to increase the efficiency of the outgoing distribution and maintenance tasks by empowering JNCOs through decentralised command and increased ownership of tasks.

In July, OSS deployed on Ex TS in support of 1 CER as part of BLUEFOR. Ex TS posed a new challenge, that of being able to provide logistic support to multiple dislocated force elements spread around the AO. OSS assumed and occupied multiple tactical positions, either co-located with the BSG or 23 SPT SQN for the duration of the exercise. This lessened the defensive burden and enabled the squadron to conduct maintenance and distribution tasks as frequently as required. The hard work of the squadron paid off during this exercise, resulting in the majority of tasks being conducted and completed smoothly, without sacrificing security.

The year has been busy and productive. It is situation no-change as OSS continues to have a number of competing priorities all seeking to distract us from our primary role in providing logistic support to 1 CER. The Soldiers and NCOs of OSS continue to put in a phenomenal effort to posture the squadron and support its readiness in for contingency operations.

Left. G-Wagon flat rack recovery
Below. shakeout training



[Sapper SITREP]

2nd Combat Engineer Regiment

LT Elliot Wood & CPL Karl Booth

Finishing up our Ready commitments in September of this year, The 2nd Combat Engineer Regiment has had a demanding but highly successful year. The Ready period has seen the unit provide a capable high-readiness scalable Engineer Force for deployment on known operations (OPGEN) and in support of contingency operations (CONFE). For OPGEN, 2 CER has provided ongoing support over multiple rotations for OP OKRA consisting of 19 pers and OP AUGURY consisting of 96 pers. For CONFE, 2 CER has maintained FE in support of the Ready Deployment Group (RDG), based on an 8/9 RAR Battle group, and the Engineer Task Group, based on a 2 CER HQ, for domestic and international contingency operations including support for DACC and Emergency Support Force tasks. Of note, 2 CER has been required to support, and in some instances lead, many of the BDE led operations and activities, including OP Indo Assist, OP QLD Fires Assist and OP Drought Assist.

In small teams and individually, 2CER deployed Sappers to the Philippines in Support of the wider ADF task force OP AUGURY. 2CER's mission was to train and mentor our Philippine counterparts against an emerging terrorist threat. The support consisted of Land Training Teams teaching vital IED search and Urban Breaching techniques to members of the Armed Forces of the Philippines.

The Regimental Reconnaissance section continued 2CER's International engagement commitments when they deployed to Vanuatu twice over the course of the year. Recon section provided crucial training and mentoring to the Vanuatu Mobile force and Police Force and participated in the culminating activity, OPERATION VANUATU ALLIANCE, which aimed to enhance the ability of the Vanuatu Police Force to respond to natural disasters. We were also fortunate enough to host members of the local Brisbane Vanuatuan community and members of the Vanuatu Security Forces at 2CER on several occasions.

Exercise Hamel signalled the end of 2CER's commitments to the Ready Battle Group and was instead re-tasked in an OPFOR role during Talisman Sabre to test the Ready 1st Combat Brigade. The Sappers were outstanding in their counter mobility role proving to be more than a challenge to the opposing Sappers conducting mobility operations against us.

As other 7 Bde units began to wind down as the year drew down to a close, 2CER ramped up to deploy to

the rural Queensland town of Gayndah for Ex SAPPER SPAN. The Regiment has close ties with Gayndah as it is the home town of SPR Jacob Moerland, a member of our team killed in action in Afghanistan in 2010. Within Gayndah the Regiment established a camp at the local showgrounds and conducted both wet and dry bridging operations on public and private land as well as along the Burnett River. We were able to conduct exciting and realistic training and were fortunate enough to engage with the community on multiple occasions and build on the Unit's enduring links with the town.

Concurrently Ex SAPPER SMOG was taking place at the Queensland Combined Emergency Services Academy. This saw the development of the Regiments Chemical, Biological, Radiological and Nuclear defence and decontamination skill.

Many thanks to all the Soldiers and Officers of the Regiment for your dedication over 2019, and thanks to the families for the on-going support – we could not do this without you. We are looking forward to what is to come in 2020.

2nd Combat Engineer Squadron

SPR Gareot

During the year, there were several key field exercises that saw the Squadron support its habitual battlegroup, BG RAM of 8/9 RAR. Exercise Diamond Sprint was a live-fire field exercise which saw 11 Troop deploy to Shoalwater Bay for four weeks and conduct high end foundation warfighting with Charlie Company. This saw the troop progress through live-fire section and platoon attacks with explosive breaching of obstacles by the combat engineers. This culminated in a live fire lane run by 6 RAR which saw a Combat Team clearance through several objectives, with artillery, engineers and armoured assets supporting the infantry clearance. This gave the members of 11 Troop an invaluable experience to conduct a combined arms breach with armour and artillery live firing in support.

Exercise Talisman Sabre saw the Squadron deploy to Shoalwater bay supporting 8/9 RAR as the motorised enemy party for 1 Brigade. The two troops deployed with reinforcement from the 5th Engineer Regiment and conducted delay defence along the Eastern side



Members of 2 CE Sq completing their CBRND refresher training.

of Shoalwater Bay. The exercise allowed the two troops to experiment with new TTP's, integrating with infantry combat teams and using obstacle effects against a live enemy party. The exercise was highly successful for the two troops, whose obstacle effects, deception plans and integration in to the combat teams effectively halted 1 Brigade in their advance.

Following a high-tempo year, 11 Troop was given the opportunity to conduct a bridging activity in Gayndah, Queensland which focused on section and troop level skills. The activity consisted of both wet and dry bridging, with the troop using the Improved Ribbon Bridge and the new model of the Medium Girder Bridge. This exercise also gave an opportunity for the Troop to conduct community engagement with the town members, which 2 CER has a long-standing relationship with following the loss of Sapper Moerland in Operation Slipper. The exercise was a success, with the troop constructing several bridges, up-skilling members on the new equipment, exposing senior sappers to raft command and bridging while building community relationships.

Being the squadron in charge of Chemical, Biological, Radiological and Nuclear Defence (CBRND), 2 Squadron planned and executed the regiments CBRND training exercise, named SAPPERS SMOG. The exercise focused on refreshing members of the regiment on their basic CBRND skills, increasing the understanding of chemical survey and sampling, working with Combat Rescue assets in a Hazardous Materials (HAZMAT) environment and conducting CBRND operations in an urban environment. The exercise was invaluable for members of the regiment, taking the focus away from traditional green role CBRND tasks and giving valuable insight in to how a contaminated urban environment adds complexities to an already difficult task. Queensland Fire and Emergency Services (QFES) allowed members of the regiment to train at their Whytes Island facility, building relationships with state authorities and allowing for information exchange to occur between the two organisations.

The Squadron also deployed numerous members on operations. Two members deployed as part of Task Group Taji VIII in support of Op OKRA. Additionally, the Squadron supported four rotations of personnel to the Philippines on Op AUGURY. Each deployment to OP AUGURY saw



7 Combat Engineer Squadron

LT Jessee Wright

As 2019 comes to a close and 2 CER hands over the reins of Ready to 1 CER, 7 SQN has just enjoyed a well-deserved two weeks reduced tempo period. 2019 has been another busy and rewarding year leading straight on from Exercise commitments and Operation ATLAS in 2018.

The soldiers of the 7 Combat Engineer Squadron have been impressive, from their commitments to TAJI in Iraq, to Operation Augury in the Philippines and to Re-mechanisation of the SQN to Talisman Sabre. The diverse training environments, professionalism and sheer work ethic that the soldiers display is a constant reminder that the Sapper is in high demand and is why the Royal Australian Engineers are premier Corps in the Australian Army.

Mechanisation of 7 SQN

The end of 2018 for 14 Troop started out with mixed emotions. It was 14 Troop who were selected to begin the process of re-mechanisation. For most 14 Troop Sappers, the Bushmaster PMV was the number one choice to traverse battlespace. Plenty of room, air-conditioned and quiet. A stark comparison to 14 Troop's new mobility vehicle: A fleet of M113's. Cramped, hot and loud

During 2018 7 SQN was trickling Sappers on to the driver and crew commander courses at the School of Armour, as well as Troop commanders to complete MROC to gain multi-vehicle command qualifications. The first field exercise for 2019 was fast approaching.

Exercise Semper Paratus

Due to a multitude of issues from the M113's 7 SQN received, 14 Troop was only able to field two M113 AS4's, two PMV's and one 40M. Mixed mobility proved to be quite a challenge. The M113's proved far more capable in all types of terrain, however, due to the hot days at WBTA, the AS4 crews and sections operating from them were all visibly more fatigued than the crew working from the PMV's.

Water and sufficient rest was the number one priority for the hottest part of the day. With the wet bulb constantly hovering around black for almost a week.

Week two saw a huge change in the weather, as well as showing the advantages of the M113. As is common place in WBTA, the weather went from extreme heat and dry days to torrential rain and

two Engineer Training Teams deploy to provide training in urban search and explosive breaching to members of the Armed Forces of the Philippines (AFoP). The two week courses ran by the training teams qualified 60 personnel in key skills required to conduct counterinsurgency operations within the Philippines. The training was well received, with the Sappers being commended on their professionalism and personable nature towards instruction. Their work ethic was matched with their personal drive for international engagement, with all rotations sharpening their Karaoke skills and sending a few "Red Horses" down range. All rank levels of the rotation reported back on how rewarding it was to impart their knowledge to a foreign force with recent operational experience.

After a busy, but rewarding READY phase, the Squadron has now moved in to the RESET phase of the FORCEGEN cycle, switching focus to individual training. RESET doesn't mean the squadron is slowing down however, with several courses, support to training activities and training exercises occurring before the Christmas Stand down period. Of note, the Squadron is supporting the 'Sappers Challenge' activity in Holsworthy, allowing engineering units from across the corps to compete for the title of Best Sapper. Concurrently, the Squadron is maintaining its habitual relationship with 8/9 RAR and conducting an urban operations exercise at Gallipoli Barracks, focusing on CBRND, THRS and integrating EDD in to urban clearances. This will close out a highly successful year for the Squadron, bearing the brunt of operational and contingency force commitments for the regiment.

Semper Primus



IRB rafting operations

mud. Mixed mobility became a key consideration for Troop HQ for movement around the battlespace.

The two PMV's prone to bogging in the muddy conditions were often recovered by the AS4's. The AS4's proved their worth time and time again as the conditions worsened and 14 Troop culminated with a live fire explosive breach of an enemy minefield, CAT 3 wire fence and anti-tank ditch. The best example of the extra mobility now afforded to engineers was shown to great effect with an explosive reduction of the enemy antitank ditch and subsequent traversal by the AS4's.

Exercise Diamond Sprint

The next big hit out for the newly mechanised troop was Exercise Diamond Sprint. 14 Troop was attached to 6 RAR's Alpha and Delta Companies; both of whom had just begun the mechanisation process as well. This was 6 RAR's first exercise conducted entirely from the various M113 platforms.

Luckily for 14 Troop the hard work put in by the crews and maintainers allowed for the deployment of four M113's: three AS4s and one ACV (armoured command variant). For the first time 14 Troop was able to lift the troop completely above track, with the only mixed mobility being the Troop supply vehicle, a 40M with an 8 tonne trailer.

Most training opportunities provided in the Combat Engineering space were route search and a live fire breach for both Companies. A large focus of the exercise was to train the abilities of the recently qualified M113 drivers, individual vehicle crew commanders and MROC qualified officers.

Surprisingly, both Companies operated their M113's in different ways. Whether this was intentional or not, this was a key lesson to take away as 14 Troop had to adjust SOP's and TTP's, which we had learnt at the School of Armour. The first lesson was learnt: discuss at length with each companies CSM or OC which way they intended to operate and manoeuvre their M113's in the battlespace.

The second lesson was an important one: communication. Time spent on an all informed net is gold and should not be used for menial questions and permissions to act. Less is more.

However, to enable effective communications on an all informed net, trust needs to be put into individual crew commanders to make their own assessment and conduct an immediate action based on that assessment. This allows for faster movement and efficient manoeuvre in the battlespace.

Enable mission command to crew commanders and it will pay dividends on the lessons they learn along the way.

The live fire breach was a culmination type activity for both companies, which was rehearsed rigorously. 14 Troop recommended to stay as a consolidated entity for the assault which allowed the concentration of engineering force onto an enemy emplaced obstacle, a CAT2 wire fence. 14 Troop was able to achieve two points of breach during the live fire mechanised scenarios providing two open lanes for the assaulting mechanised infantry.

Exercise Talisman Sabre

Again 14 Troop fielded four M113's. The same vehicles as on Exercise Diamond Sprint. At this stage the vehicle crews were familiar with the ins and outs of their own individual vehicles.

14 Troop was not directly attached to a particular Company, instead 14 Troop serviced three separate mechanised infantry Companies. With clear intent given from 7 Squadron HQ, 14 Troop was to operate independently and conduct the counter mobility battle as red force.

Conducting a counter mobility battle across such a large battle space, 14 Troop relied upon the Troop 40M with trailer and prepositioned Class IV caches. The mixed mobility issue again raised its ugly head and significant planning was conducted to ensure our wheeled vehicle could operate in the same areas as the M113's. At every possible instance the 40M was sent to a hide location as far to the rear as practicable and was brought forward only during stores drop offs. This was important as 14 Troop was providing its own security, it could not afford to be detected by Blue Force ISR assets.

Advantage was given to the Sappers and HQ of 14 Troop due to the knowledge of the M113 capability. Opposing the advance of a mostly mechanised Blue Force made terrain analysis simple and the heavy use of nuisance minefields was used to great effect (during the range refurbishment 14 Troop discovered that most nuisance minefields placed would have had a substantial effect on Blue Force vehicles due to multiple vehicle tracks and broken AT mines discovered).

The re-mechanisation of CE units around Australia is still in its infancy. To build an effective mechanised engineer force is going to require professional NCO's, motivated Sappers and above all growth to generating the fighting force it once use to be.

Operation Augury

LT Daniel Kierath

The rise and subsequent fall of Daesh has shown the threat that non-state actors can pose to sovereign nations. This threat was brought violently into focus for the South East Asian region with the siege of Marawi where Islamic State affiliated groups fought a five month battle against Philippine forces.

OPERATION AUGURY arose as a bilateral arrangement where the ADF is able to both provide training to Armed Forces of the Philippines (AFoP) and build relations in SE Asia with a partner nation in the fight to stem violent extremism. 2 CER manned the training teams from August 2018 until November 2019 and saw the ranks of Sappers to Lieutenants deploying to deliver the training.

OP AUGURY involved all arms of the ADF and the role that RAE were assigned was to conduct search and urban breach training packages for members from Philippine Army, Marine and Special Forces units. The training was conducted in two week courses, with one week allocated to search and one to urban explosive breaching. The training was tailored to the local threat picture and every effort was made to maintain relevancy by drawing learning points from attacks that occurred in the Philippines.

The search phase of the course covered the individual and section level search skills along with the equipment that can be used to assist during search

SPR Adrian Halpin instructing AFoP members on Australian search equipment and techniques.





tasks. Along with the understanding of the search drills, instructors tried to impart an understanding of why they were conducted so that they could be adjusted by participants to local conditions.

The urban breach phase of the course aimed to provide the demolitions skills to provide mobility for manoeuvre elements in an urban environment. Confidence with explosives along with breaching charge construction and placement were the skills taught during this phase.

OPERATION AUGURY did pose its individual challenges such as how to teach search to AFoP members who had no access to metal detectors, an integral piece of equipment for sappers conducting search tasks during the recent operations in Afghanistan and Iraq. This, along with other issues, was overcome through soldiers working with AFoP members to develop a detailed understanding of the threat they faced to develop practical and robust solutions.

OPERATION AUGURY was an opportunity to develop the skills of a regional ally for whom an active kinetic threat exists domestically. The soldiers delivered the training to a high standard and can be proud of their work as the responsibility for manning the operation transfers to 1 CER in November 2019.

Exercise Sapper Span

CAPT Christopher Grimes

From August to September the 2nd Combat Engineer Regiment deployed 7 Squadron on Exercise Sapper Span in Gayndah, a non-Defence training area to hone in and further develop the Regiments Bridging and Watermanship capabilities. Gayndah, located 4 hours north-west of Gallipoli Barracks proved to be an ideal and non-scripted training location in order to execute independent Troop level Tasks. The Gayndah Burnett River provided ample amounts of space to manoeuvre the Improved Ribbon Bridge (IRB) with both council and private land used to deploy the Medium Girder Bridge (MGB).

The three-week long Exercise Sapper Span was led by the 7 Combat Engineer Squadron and entailed a bull ring activity with Troops rotating through both the MGB and IRB training. The exercise was key in enabling Troop led technical training, JNCO development and providing training for potential Humanitarian Assistance Disaster Relief in regional communities. The Regiment also deployed Trade members from the 24 Support Squadron to conduct remediation works to improve the Jacob Moerland Memorial Park Reserve. This saw the tradies emplace new concrete footpaths throughout the Memorial Park and assist in constructing the new foot bridge.

The Regiment has had close ties with Gayndah, as it is the home town of Sapper Jacob Moerland, who was killed in action in Afghanistan in 2010. The Regiment over the years has forged a strong relationship, attending ANZAC Day marches, Remembrance Days and Gayndah RSL Sub Branch events.

Gayndah's community was exceptional in welcoming 7 Squadron. Residing in the Gayndah Showgrounds allowed the Sappers daily engagement and interaction with the local community. 10 FSB provided 6 Caterers who supported the Regiment from locally sourced produce and catering for community engagement and BBQ's. From a pig on the spit, to lamb roasts, it was evident that soldiers know how to feed soldiers.

Ex Sapper Span was also about involving the soldiers within the local community. Soldiers and Officers were provided the opportunity to visit the local schools, girl guides and be involved in community sporting events. It was just another reflection of how important the impact soldiers can have in a community and what non-Defence training areas can offer to regiments and battalions within Army.

Gayndah has not seen the last of us with 2 CER returning in January 2020 for Ex Inspience Command.



24 Support Squadron

Construction Troop

2019 saw the amalgamation of Plant and Construction Troops to see the callsign containing two Plant Sections and one Trade Section. The Troop deployed on exercise *Semper Paratus* in March which presented the opportunity to consolidate Troop level skills in the field prior to deploying on exercise *Diamond Sprint* where priority of support was given to the Combat Engineer Squadrons. *Talisman Sabre* culminated the year's field training for Construction Troop with blade teams detached to BG HEELER and RAM primarily supporting defensive operations with armoured vehicle scrapes and anti-tank ditching. The Trade section worked into the brigade deception plan constructing mock-up M1A1 Abrams and Bushmasters in dummy positions. During exercise *Sapper Span* the Plant Sections supported bridging activities while the Trade Section worked on a separate line of effort constructing a footpath in the local park and renovating the RSL facilities.

During June 2019 the Trade Section deployed to Tonga as a Construction Mobile Training Team (MTT). The MTT, as a part of the Defence Cooperation Program, partnered with the 1st Construction Engineer Squadron (1CES) from His Majesty's Armed Forces (HMAF) in the construction of a new Naval Headquarters Building at His Majesty's Naval Base Masefield. The MTT jumped into the project with respective tradesmen integrating with their Tongan counterparts and employing a range of construction techniques which provided a great opportunity for both ADF and HMAF members to learn from each other.

Combat Rescue Troop (CR Tp)

CR Tp has been developing its personnel rescue capability IOT further support a modern, mobile and ever growing Defence Force. This rescue capability has been structured to be adaptable, mobile and effective in both humanitarian and combat situations. Breaking the troop down into four person squads, each member is equipped with a load out to suit any rescue configuration e.g. reciprocating saws, CFA kits, SKEDS (stretchers), hydraulic jaws of life, chainsaws, lifting bags and jungle clearance tools. In addition to these specialist tools, each rescue technician has enhanced their incident entry methods to include dismounting from armoured vehicles, vertical roping and winching from airframes using jungle penetration methods.

CR Tp has consistently delivered this support to meet a high tempo year of further enhancing Australia's relationships within the pacific region through Ex Vanuatu Alliance, Tonga assist, Op Resolute and Op Solomon Islands Electoral



Top. SPR Schenk makes entry into a battle locked M113 IOT extract a casualty during OER Training.

Above. SPR's Sippel and Sharp observe their rescue equipment being hoisted by an MRH-90.



The deployment of the new WPDS Light is tested during the WPDS Course.

Assist. CR Tp has conducted various field training activities participating in Exercises Diamond Sprint, Semper Paratus, Silicon Diamond, Hamel and Sapper Smog.

While not being hostile areas; these engagements with Australia and her close allies have provided an excellent opportunity to further develop CR Tp's harmonisation with the wider Army, specifically medical and rotary wing assets. These key accomplishments have left the Combat Rescue Troop in an excellent position to provide vital relief to civilians and friendly forces alike whether domestically or abroad.

Specialist Troop

During 2019 – 2 CER's Specialist troop continued to develop a number of capabilities designed to support the Brigade in the conduct of both combat and HADR Operations. Overall the Troop had a busy year, and were able to achieve a multitude of milestones. The roles of the Troop during 2019 were primarily operation of Water Purification and Desalination System (WPDS) and introduction of the Dry Support Bridge into 2 CER capability.

In the interest of modernising the WPDS, Specialist Troop was tasked with the trial of a 'light' WPDS which could be transported using G Wagon 6 x 6 and trailer. The system was trialled during Exercise Semper Paratus, in March 2019 and used on a number of occasions throughout the year. The trial involved some additional familiarisation training from WPDS Medium, and field work to test the capability of the machine. Overall the capability looks very promising for Army Capability.

Demonstrations of WPU operation, in both barracks and field like conditions, has been highly sought after following the course. However, with the invaluable skills passed on from the course instructors, it's safe to say the future of the water purification capability within 2CER is in good hands.

In addition to Water Purification, Specialist Troop has participated in a number of Dry Support Bridge (DSB) Courses at SME throughout the year. During these courses, the team has learned the fundamental skills required to operate the DSB in a field environment. During November 2019, the Troop will join forces with 1 CER's DSB Section in order to pass on knowledge and lessons learned from the more experienced section. Members of the Troop are looking forward to DSB builds becoming a regular training challenge and furthering their skills as a team.

Finally, 2019 was a busy year for 2 CER's Explosive Detection Dogs (EDD) and their handlers. Throughout the year, the EDD teams were able to attach to the Combat Engineer sections within the Regiment, and support search operations throughout the Brigade. Members of the EDD section participated in RCB and were afforded an opportunity to conduct some mentoring and training with the Malaysian EDD capability in Wolf Wing, Pulada.

Overall, Specialist Troop was challenged with the introduction of a number of capabilities throughout the year, but met all the challenges with enthusiasm. 2020 is an exciting year for the Troop and will see the solidification of much of the ground work conducted this year.

[Sapper SITREP]

3rd Combat Engineer Regiment

LTCOL Paul Pembroke

2019 started with an unexpected challenge for Townsville, rains of biblical proportion thanks to a tropical low that parked itself over the region. The first calls for assistance came during mandatory training as low lying areas began closing schools and many families were affected. 3CER personnel were among the first to move in support of the community with initial aid through flood mitigation and subsequently assisting with rescue operations when the waters rose further. Unit personnel were involved in deployment of small boats and wading through flood waters from house to house extracting people and their possessions. Flood waters peaked on the night of Sunday 3 February and there were many from the Regiment who were forced out of their own homes and took up residence in Barry's place on Barracks. Even with all the upheaval incurred to the members and their families, everyone still came in to work and deployed out to assist the flood stricken community. The initial flood efforts lasted approximately 6 days, and when the water began to recede, the main effort switched to the clean-up which 3 CER took the lead on.

The clean-up involved initial planning and reconnaissance on the worst affected areas and then the subsequent deployment of Combat Engineer Troops with plant and trucks to remove the discarded waste from people's houses which was strewn on footpaths, lawns, roads and open spaces. The Troop Commanders were reinforced with further personnel to assist with loading and removal of waste to the temporary waste facilities, and at times had a squadron size contingent to control including personnel from both RAAF and Navy. The 40 degree heat and humidity from the flood water made the going tough but with plenty of support from external units and with great support from the local community who supplied endless meals and rehydration, the Troops made good head way. On 17 February with the job well on its way to completion, the local council took over and resumed responsibility.

The unit acknowledges the great work of the RAE foundation who coordinated collection and disbursement of donations for those affected by the floods. A heartfelt thankyou to all who helped support the engineer family during this time.



*Op FLOOD ASSIST
clear up operation*



Switching targets from HADR to combined arms training the unit rapidly adapted to the compressed schedule ahead. Starting with Ex Dingo Fury, where our brothers from the PNGDF Engineer Battalion joined 16 CE SQN for the Regimental exercise, 2019 has been an outstanding opportunity to practice engineer support to the combined arms team. The standout was deployment to the US as part of the Joint Warfare Assessment 2019 where 3 CER as part of 3 (ANZAC) Brigade war gamed Multi Domain Operations in the 2028 time frame against a near peer adversary. The opportunity to test new capabilities as part of a Multi-National Division against a very capable enemy was invaluable training. Concurrent to this 18 CE SQN led unit involvement in Exercise Brolga Walk, the Brigade's live combined arms training activity. Add support to Talisman Sabre 2019 and Exercise Brolga Run to the other Brigade activities and 3 CER was able to practice engineer support to the combined arms teams of 3 Brigade to a standard above that expected.

The long and mutually beneficial relationship between 3 CER and the PNGDF Engineer Battalion was continued



in 2019 through Exercise Puk Puk, the annual training activity between the two units. Consisting of two training teams in the first half of the year the exercise culminated with 25 SPT SQN forming PUKPUK SQN and returning to Igam Barracks in Lae, the home of the PNGDF Engineer Battalion. 2019 saw apprentices from the School of Military Engineering, tradies from RAAF as well as our reservist brethren come together to deliver the activity with 3 CER, a total of 93 personnel from five brigades.

Key standouts were the first international deployment of the Land 121 fleet, delivery of the first horizontal construction task for Exercise Puk Puk and the first PNGDF site foreman. The evolution of Exercise Puk Puk is a testament to the professionalism of all those involved from the ADF and PNGDF over the last 17 years.

Whilst the primary focus of Exercise Puk Puk is developing partnered Engineer capability, the SQN also facilitated a number of courses for key support staff, including the delivery of small engines operator maintenance training to PNGDF members and the delivery of multiple medical training packages. This training was enhanced through the conduct of a Chaplaincy working group in Port Moresby, with 15 PNGDF Chaplains, headed by the 3 CER Chaplain and the conduct of an Igam Barracks Women's Group, headed by soldiers from 1 CHB, empowering local women to undertake roles of responsibility and power. The Soldiers of 3CER, supporting Units across the ADF and the PNGDF represented their country with distinction and fostered relationships that will continue for many years to come.

3 Brigade enters the Readying phase of the Force Generation cycle in 2020 and all members of 3 CER are looking forward to the challenges ahead. Foll

16 Combat Engineer Squadron

WO2 Daniel Hedges

2019 has been a challenging and rewarding year for the members of 16th Combat Engineer Squadron, from domestic response through to multiple combined arms training activities. Starting the year out of the blocks with support to the Townsville flood, an incredible effort which saw the majority of the SQN work through periods of darkness and wade through rising flood waters, whilst recovering distressed people of the community, in small watercraft, from their homes to a safe location. This was met with high praise from local and federal government, which saw the subsequent six weeks committed to removal of debris from homes, streets and suburbs. This developed into a massive combined effort to reduce secondary hazards, control additional spread of waterborne infections whilst supporting the community. Ultimately, resulting in 16 CES exemplifying the readiness culture of the 3rd Combat Engineer Regiment.

In the Reset phase of the Force Generation Cycle, 16 CES concentrated on individual skills development, developing the JNCOs, exercise support, and a variety of external training support requests that covered most of Australia. In addition to personnel development, 16 CES participated in four deliberate activities this year being; the Joint Warfare Assessment hosted by the United States, Operation Augury, Exercise Olgetta Warrior, and Philippine Assist.

16 CES participation in these activities provided an excellent training opportunity for its members to integrate their combat engineer skills with regional partners and gain exposure to foreign forces, how they train and operate. The provision of the training was world class, professional and continues to bolster the international relationship. The activities presented the opportunity for individuals, across multiple lines of effort, to conduct a scope of work they train for and put into practice. This resulted in recognition for exemplary work, culminating in several nominations for awards.



16 CES sappers after a successful breach during Ex Phoenix Rage

With 16 CES being the CBRN capability for 3 CER and 3 BDE, it provided remediation training to over 500 personnel of 3 BDE and other BDEs whilst also expanding its focus to develop SOPs for the next generation of CBRN capability (many of which have been developed by the JNCO and SPR operators). The new capability is expected to be introduced to wider Army from December 2020. It remains an exciting time for the RAE Corps and focus of specialization for 16 CES.

16 CES commitment to Operation Augury continued in 2019, with 15 TP being selected to represent and provide supported training; focusing on Search, Demolitions, and incident management. Furthermore, 15 TP continued to enhance the RAE High Risk Search capability through the conduct of an independent Troop exercise designed at defeating current and future improvised threats.

The main effort for 16 TP has been the provision and development of the 3 BDE CBRN training continuum and receipt of the new CBRN capability. This focus has allowed for a significant number of identified shortfalls to be remediated and enhance the combined arms capability of 3 BDE. The work that 16 TP are conducting in this realm is supported by AHQ and they are leading the way for how the Army will fight in the future.

The year has been busy yet rewarding for 16 CES both as a collective and individually. As the SQN concludes the RESET year it will transition through the READYING and READY phases of the FORGEN cycle next for 2020 and will continue to remain the Premier squadron for 3 CER, providing an agile and adaptive Combat Engineering capability to the Combat Brigade and Joint Force.

18 Combat Engineer Squadron

MAJ Orry Kirkham

2019 has been another extremely busy year for 18 CE SQN, as we continued our 'Road to READY', Mechanisation and Combat Engineer Dive modernisation.

The articles that follow will provide a detailed review of the suite of exercises, training activities and operations the SQN has undertaken in 2019. Amongst them, Op TOWNSVILLE FLOOD ASSIST, Exercises BROLGA WALK, BROLGA RUN, THUNDER & KAPYONG WARRIOR, PACIFIC PARTNERSHIP and WANTOK WARRIOR. An enduring theme has been our regular integration with 3 RAR, who we have established an excellent relationship with across all levels, genuinely

being considered an element of BG KAPYONG. We have also been successful in deploying two individuals on operations in the Middle East, and have welcomed the involvement of USMC Engineers and members of 22 Engr Regt (UK) on sub-unit activities throughout 2019.

Concurrent to the immense activity and exercise load, has been the ongoing generation of a Mechanised CE SQN, and the pursuit of a more modernised and tactically relevant Combat Engineer Dive capability. Both have proved challenging, as they are subject to the influence and decisions of organisations external to the SQN and Regt, however, the SQN has persevered through this, continuing to seek the outcomes and changes I have asked of them.

This 'RESET' year has been anything but, and I would like to take this opportunity to highlight some of the professional and personal achievements of individuals and small teams within the SQN in 2019:

- The performance of the SQN's Ex PACIFIC PARTNERSHIP contingents under the leadership of CPL's Matt Sullivan (Malaysia) and Dan Bailey (Micronesia). Both contingents drew considerable praise from the multi-national contingents that they supported during the activity.
- The results of the SQN's OPIE Trophy team (3 RAR section challenge) led by LCPL Matt Phillips. The team finished 5th of 16 sections overall, whilst a number of individual members finished in the top 50 overall soldiers out of nearly 300 participants. LCPL Jake Wilson is commended for his 13th placed finish overall in this activity.

An M113AS4 APC (E21A) conducts a mechanised crossing of Keelbottom Creek during Ex Brolga Walk



SPR Juranic watches British Army divers enter the water during CEDC in TFTA

- The tireless efforts of CPL's Henry Brien and Brock Foster, and LT's Emma Forward and Jass Zarlenga in leading the ongoing mechanisation of the SQN. CPL Brien instructed on nearly every BDE internal AFV drivers course, whilst CPL Foster and a small team of drivers spent over 50 days out field supporting the 1 ARMD BG on the Joint Land Series. LT Forward also instructed on a SoARMD Interim Crew Commander's course, her performance drawing praise from the school's Mechanised SME cadre.
- The performance of 23 CE TP in the 3 RAR Cross Country competition, of which their TP COMD, LT Ollie Palmer placed 1st overall.
- Of particular note, CPL Matt Sullivan was awarded the best RAE JNCO in the Corps for 2019.
- The following SQN members were promoted in 2019 – SPR's Jake Wilson and Travis Taylor, and PTE Felicia Matthews were all promoted to LCPL. LCPL Matt McKenzie was also promoted to CPL.
- The following SQN members completed significant personal achievements in 2019 – CPL Max Martin married Emma in September, SPR Oscar Prosinski and his partner Chelsea gave birth to son Torvan, whilst SPR Kira Tisdell gave birth to daughter Savannah. In 22 CE TP, SPR Nick Wilson married Femke, the couple then giving birth to Emmylou, whilst SPR Nick Bowman and his partner are expecting in 2020.

The patience and commitment of our families and friends cannot be overstated. Without your love and support, soldiers would not come to work in the morning ready and willing to do their jobs. I recognise and acknowledge that service places immense burden

on partners, kids and families, nonetheless, your stout patience and stoicism in the face of another challenging year has not waned or waived.

Finally, MAJ Will Harper will assume command of the SQN in 2020. 18 CE SQN is the best sub-unit in the Regiment, and its soldiers, NCO's and Officers are amongst the best of the RAE. It has been a privilege and honour to command them over the last two years. I wish the SQN the very best for the future.

Operational Support Squadron

MAJ Andrew Lawrence

Operational Support Squadron (OSS) has had a busy year within the RESET phase of the FORGEN cycle. OSS started the year with Domestic Humanitarian Aid and Disaster Relief Deployment for Townsville Flood Assist, Exercise ATLAS Rage, assist Exercise Puk Puk 19 in Papua New Guinea and developing the CBRND Decontaminating Station capability.

The 2019 Townsville Floods had a major impact on the Northern Queensland region with a gradual build up to the sudden release of the dam flood gates. Once the dam

flood gates were released, 3 CER were tasked to stand up an emergency evacuation centre at the Lavarack Barracks Area Gym to assist the civilian services in providing for the Townsville population that were effected. OSS were the main lead with support from JLU-NQ and 3 Combat Service Support Battalion and quickly established stores and equipment whilst also receiving a steady inflow of effected personnel. The effected Townsville population were rescued through a combination of Army and civilian services arriving at the evacuation centre using a fleet of Defence and Civil Service vehicles. Throughout the night, OSS transitioned over 600 people through the evacuation centre providing, food and water, sleeping bags and stretchers. The Queensland Police Service and State Emergency Service were particularly noteworthy working throughout the night and built an excellent rapport with OSS members during the operation.

After the flooding subsided, OSS personnel under the command of LT Van Der Heyden were attached to OC 16 CE SQN to support the clean-up of the local area. Workshops and Q-Store personnel were tasked with recovery, driving and manual labour to take away hard waste from civilian residences to the Townsville collection locations. Overall, the disaster created an extremely tough and dirty environment to work in; however, the



Land 121 3CER lifting test prior to deploying on Ex Puk Puk



OSS showcasing their DECON capability

disaster allowed the Squadron to form tight bonds in an unprecedented manner and ensured a cohesive team going into the future.

Exercise Atlas Rage saw the whole Squadron deploy into the Townsville Training Area independently focusing on all Corps soldier skills and achieving ATLS 3C. The exercise was split into two weeks, with the first week focusing on all Corps soldier skills and small teams with the second week focusing on Platoon size elements conducting logistic tasks in the field environment. Throughout the exercise, OSS integrated real time support with 16 and 18 CE SQNs from Cowley Beach Training area and Townsville Training Area. The culmination activity with 16 CE SQN was a complex ambush during the middle of a distribution point with multiple casualties amongst both call signs. This was OSS first opportunity to deploy the new Land121 vehicles in the field environment and was a steep learning curve for the difference in capability from Legacy Fleet.

As the year continued Operational Support Squadron then supported Exercise PUK PUK in 2019 with LT Van Der Heyden deploying as the S4 with several personnel from Workshops and the Q-Store. The seventeenth iteration of Ex PUK PUK was conducted at Igam Barracks in Lae, PNG and the deployment to Exercise Puk Puk 19 was to be 3 CERs opportunity to test the Land 121 capability abroad as this was the first time Land 121 vehicles were deployed overseas for 3CER. The contingent was to deploy 1 x HX77 dump, 1 x 40M dump and 2 x 40M cargo for the duration of the August to October exercise. From the outset, there was found to be no doctrinal lift guidance for Land121 vehicles due to no designated lift points for crane lift onto the ship. After

consultation with 3BDE MAAR, RACT and Land121 a procurement of specialist lifting slings were identified a week out from loading. During the Exercise, the Land121 vehicles proved they were capable of being deployed into the Asia Pacific Region with minimal difficulty.

One of the major capability milestones reached in 2019, was the transition of CBRN-Decontamination from being an exclusively RAE task, after the successful trial and training of OSS personnel, to an All Corps task. During the middle of the year 15 OSS personnel were trained by 3 CER Combat Engineers lead by OSS SSM WO2 Simpson (RAE) and the QM CAPT Mandl (RAAOC) in the Basic Operators Course, followed by hands on training to establish and operate the Portable Decontamination Station (PDS) and the Light Decontamination Station (LDS). Since then OSS personnel have conducted several refresher deployments of the PDS and LDS in preparation to conduct live Decontamination of 1 RAR and 3 RAR soldiers during Ex Brolga Run. The aim of developing this capability as an All Corps or Logistics function is to enable Combat Engineers to 'stay in the fight', supporting the Commander's manoeuvre plan, and arm Logisticians with the skills to manage the entire receipt of exposed personnel and refit-to-fight process.

Under this new capability structure, Logisticians, already involved in collecting exposed personnel from a contaminated area, would be able to establish a decontamination site outside the 'hot zone', deliver exposed personnel to it, decontaminate them, re-issue and re-arm them, transport them back to battle positions, coordinate deconstruction of the decontamination site and finally the collection and decontamination of any reusable stores and equipment. With Logisticians already equipped with stores and personnel transport assets, adding decontamination skills and equipment to their arsenal, provides Commanders with a self-deployable capability to assist in CBRN operations.

Looking further ahead on the 'Road to Hamel' OSS will conduct further Decontamination training and prepare ourselves to be the lead for Decontamination training and expertise within 3 BDE. The final test for OSS members will be conducting a certification exercise on Ex Hamel 2020, by conducting live decontamination for BDE Units in the field. As OSS looks to close out 2019, the focus is now on preparing the REGT for the 'Road to Ready' in 2020. Next year OSS will support the CE SQNs, and itself, through several field exercises to ensure the REGT achieves certification as part of the Ready Brigade from October 2020.

[Sapper SITREP]

5th Engineer Regiment

LTCOL Renée Kidson & CAPT Natalie Huntsman

The CO opened 2019 with the simple commander's guidance of: 'Create positive opportunities for our people'; and 2019 did not disappoint! 5th Engineer Regiment has enjoyed a busy 'READY' year, deploying in support of the highest number of operations and exercises in a single year of our Regiment's history. 5 ER members flew the banner for part time engineers deploying on OP HIGHROAD, OP ACCORDION, OP AUGURY and three Transit Security Element (TSE) rotations on OP RESOLUTE. Back on home soil 5 ER continued to deepen our inter-operability with 2 CER as well providing support to AACAP. For the first time, 5 ER members were involved on both sides of the battle for Ex TALISMAN SABRE 19, in the roles of both OPFOR and BLUFOR. 5 ER will finish off the year sending a composite combat and construction engineer element on Rifle Company Butterworth (RCB-128).

In March a Troop from 5 ER attended 2 CER's Ex SEMPER PARATUS. To ensure the best lateral skills transfer between the part time and full time members, the part time members were integrated throughout the 2 CER SQN's, with a significant positive training outcome. With 2 CER being a mounted regiment this presented a steep learning

curve for some of our Sappers who had not previously operated in that manner; in typical 5 ER fashion our members rose to the task!

Combined-Arms interoperability within the 5th Brigade was also a strong theme in 2019. 5 ER participated in the 5th Brigade's Ex TELOPEA SPRINT in April, with both construction and combat engineers critically involved in the Scheme of Manoeuvre. Under time pressure to complete a Patrol Base refurb for friendly force occupation in Vere Sector, 101 Construction Squadron completed the combined-trades work of electrical fitout, roofing and plumbing. Manoeuvre force mobility was enhanced with horizontal works of improving roads and drainage, opening up a previously impassable passage over the ranges which significantly sped-up manoeuvre force movement. Embedded with those manoeuvre forces, the CE troop refreshed All Corps skills before focusing on area, route and unoccupied building search.

Ex TALISMAN SABRE 19 showed 5 ER Sappers as a critical force multiplier for the manoeuvre commanders of 7 BDE. Attached to both 2 CER and 8/9 RAR, Army's biggest



Ex JOHN MUIR Military Skills Competition winning section

Construction of wire obstacles



exercise once again provided valuable training opportunities for 5 ER's construction and combat engineers, with a Squadron plus-sized force element deployed.

Making excellent use of their earlier Ex SEMPER PARATUS lead-up training with 2 CER, 5 ER sappers were deployed in the Eastern sectors of SWBTA mounted in PMVs for OFFOPs. Defensively, 5 ER's sappers were also embedded with 2 CER through the development of a CT and BG position and our plant operators further contributed to shaping the battlespace through the construction of hull-down vehicle positions and other defensive works.

Ex JOHN MUIR, held in August, brought together sections from all Squadrons in our annual engineer mil skills challenge to identify the Regiment's 'Best Section'. While an extremely close event, 14 CE Squadron (Adamstown), commanded by LCPL Williams, won the event, third year running! This section will now proudly represent 5 ER in the 5th Brigade annual military skills competition to be held in late 2019.

Ex AUTUMN SAPPER, held in chilly Majura (Canberra), was the perfect lead up activity to Ex SPRING SAPPER which took place in Singleton. The basic tree felling course conducted in the Majura pine forest, followed by the portable sawmilling course in Ex AUTUMN SAPPER, won our timber resources to fabricate two huts during Ex SPRING SAPPER. During the latter Ex, the huts were then reduced during a combined arms cordon-and-search and assault (explosive) breach, involving both 5 ER and an infantry platoon from 4/3 RNSWR. Additionally, the Multi-Rotor Unmanned Aerial Systems operator's course conducted on Autumn Sapper paved the way for our newly qualified UAS operators to conduct tactical ISR in support of area and unoccupied building search during Spring Sapper.

Individual achievements of our members have continued to distinguish 5 ER throughout 2019, with CAPT Andrew Hargreaves attending Harvard University on a scholarship after receiving the Prince of Wales Award. to conduct research into France-Australia relations, SPR Alex Brown and LT Andrew McKinnon being selected for the Army Drone Racing Team and SPR Kim Waterhouse receiving a CO's Commendation during TSE Rotation 93. 5 ER also wishes to thank WO1 David Pilkington, WO1 Norm Ingle and MAJ Brain Houlahan for their 40+ years of service; all three members received their Federation Star with clasps.

5 ER broke new ground in our 'Army in the Community' role in 2019, with 107 5 ER members participating in official capacities on ANZAC Day, covering 17 events across NSW and the ACT. This is the largest ANZAC Day contribution in our Unit's history. This year we reached-out culturally, honouring Indigenous warrior heritage and language by renaming Ex SPRING SAPPER as Ex KARAKA SAPPER, respecting the local Wonnarua word for Spring. Uncle Warren joined us for the ceremonial renaming on Singleton Range; and also witnessed the launch of 5 ER's first Cultural Harmony Statement. As 5 ER is one of the most diverse units in Army, the Statement highlights our Unit's diversity as a key source of warfighting advantage: because a bigger toolbox of engineer skills means we can solve more problems in the battlespace.

The job of 5 ER's command team throughout 2019 was to provide opportunities for our members to Get Involved, Grow, and Give Back to Army with valuable engineer capability. But it was our members who seized these opportunities, exceeding expectations for what is possible to achieve in the part-time force. We thank all our members, their families and their employers for their contributions to Army and the nation in 2019: we look forward to another year of combined engineer excellence in the part-time force in 2020.



SPR Kim Waterhouse is awarded a CO's Commendation

[Sapper SITREP]

6th Engineer Support Regiment

LTCOL John Venz CSM and WO1 Sean McAlinden

This year has seen the Regiment continue to enable the Joint Force to live, move, and fight. The Regimental Headquarters has demonstrated its ability to provide an Engineer Plans function for the Deployable Joint Force Headquarters and an Engineer Task Group Headquarters during Exercise Talisman Sabre 2019. 17 Construction Squadron has delivered construction effects in support of the Joint Force by enabling Exercise Talisman Sabre 2019 and other support tasks in the region. 20 Explosive Ordnance Disposal Squadron has delivered support to the 1st Brigade during Ex Talisman Sabre and to the near region through Operation Render Safe on multiple occasions, 21 Construction Squadron has delivered a successful Exercise Saunders (Army Aboriginal Community Assistance Programme – AACAP - 2019) deployment, and the Operational Support Squadron has been exceptional in the provision of support to the Regiment and has proved the Joint Task Force Engineer Logistics Park concept.

None of this would be possible without the support of our Regimental Family consisting of our families, veteran's groups, and the wider community. The opening of our Regimental Memorial is at the root of recognising the selfless service of those who have gone before us. It has not been an easy task to support the wide range of activities that the Regiment has undertaken in 2019 and

the support provided to better the lives of others has been a considerable addition to the Regimental story of selflessness, precision, and determination.

Regiment Works Office

CPL Folkard and LCPL Van Rees Hoets

The completion of 2018, and the year to date has been a busy year for the Works Office. Even with a relatively small team, the Works Office supports and enables the Regiment to deliver Operational Mobility to the Joint Force.

From late last year, LCPL Van Rees Hoets was deployed on Operation Southern Discovery in support of the Australian Antarctic Division's modernisation project at Mawson and Davis Stations. Tasks included littoral surveys of the existing wharf and surrounding areas, runway and transshipment area at Davis Station, and the West Arm and coastal region of Mawson Station. SPR Carey also deployed to Macquarie Island in March supporting the integral resupply missions over the Antarctic summer, and preparations for the winter. Other tasks included delivery of a tide gauge to monitor the lakes, core drilling and sampling for scientific research of climate change.

In 2019, a Works Office detachment supported 17 Construction Squadron during preliminary works

Bear Quarry



for Exercise Talisman Sabre. This included road construction for the Force Support Group, and the Bear Quarry feature survey. Additional survey and civil design for the Fixed Modular Bridge construction were also conducted, with supporting technical and environmental advice from WO1 Hall.

The Work Officer represented all Engineer effects, as the Deputy Divisional Engineer, at Divisional Headquarters. A small detachment supported Exercise Control providing advice on range remediation, and co-ordination of engineering assets.

LCPL Van Rees Hoets and SPR Kelly deployed to Lae with 3 CER on Exercise Puk Puk 2019. LCPL Cox and SPR Johnny-More participated in AACAP 2019 at Jigalong, Western Australia. SGT Jeffery participated in Exercise Hari'i Hamutuk with 1 CER in Timor Leste as the Vertical Construction Manager.

2019 has brought a number of short notice engineering tasks within Australia and overseas. Both CAPT Black and WO1 Hall supported works in the South West Pacific by assisting and learning from our engineering partners.

17th Construction Squadron

CAPT Chicoutimi Done

From the Joint Warfare Series to NAIDOC Week, 17 Construction Squadron's 70th year saw many firsts for the Squadron and 6 ESR. This year, 17 Construction Squadron saw personnel employed in a variety of jobs both in Australia and overseas.

Leading up to Exercise Talisman Sabre in July 2019, 17 Construction Squadron built a large part of the enabling infrastructure for the multinational activity conducted in Shoalwater Bay Training Area. The squadron enabled the joint force to live, move and fight through the construction of a 2.4km ring road, a bulk fuel installation, a transshipment area essential for the divisional logistics, a large hard stand for a Role 2E hospital and improvements to the amphibious landing zone, among many other infrastructure tasks.

During the time on Talisman Sabre 19, 17 Construction Squadron also conducted quarrying operations concurrently, winning material and using a crushing train to create quality road base. This material was used to reinforce roads and river banks, including keeping access open to Headquarters 1st Division during heavy rain. Water Purification and Desalination Systems were established at two points on the range by 17 Construction Squadron, and provided the Blue Force with nearly three million litres of potable drinking water. All of this was drawn from natural sources and supplied within a tactical threat environment.

While supporting Exercise Talisman Sabre 19, 17 Construction Squadron constructed a Fixed Modular Bridge (FMB) and operated it over the main North-South MSR, demonstrating logistic mobility for the joint force over rivers or destroyed bridges during combat. This large and heavy line-of-communication bridge had not been constructed in an exercise environment in many years, and was for most engineers, the first time they had seen one built and employed during field training.



17CS completing an FMB during Ex Talisman Sabre 19

Throughout the year, 17 Construction Squadron has participated in a wide range of other activities outside of the Joint Warfare Series. In June, the Squadron moved a sacred scarred tree on RAAF Amberley to a new resting place and took part in a placement ceremony alongside members of the RAAF as part of NAIDOC Week. Members of 17 Construction Squadron have conducted several reconnaissance missions across the South West Pacific. The Squadron has also heavily supported the ongoing commitments to operations in the Middle East Region with engineer tradespeople. Additionally international exercise support has seen construction supervisor support to Exercise Puk Puk in Papua New Guinea, and engineer support to Exercise Ballikatan in the Philippines.

In September, 17 Construction Squadron celebrated its 70th birthday with a weekend of displays, dinners and social functions alongside the 17 Construction Squadron Association veterans. The Squadron reflected on its proud history of service from Vietnam, Namibia, INTERFET and multiple engagements across the Pacific, to ongoing commitments in the Middle East and the Army Aboriginal Community Assistance Programme today.

2019 was a big year for 17 Construction Squadron, with jobs both large and small across Australia and beyond. After 70 years, the squadron continues to be an essential pillar in 6 ESR's role of enabling the joint force to live, move and fight.

20 Explosive Ordnance Disposal Squadron

CAPT Andrew Harbour

2019, like the last few years has been jam-packed for the 20th Explosive Ordnance Disposal Squadron (20 EOD SQN). The tempo; high and persistent, the environment; varied and unpredictable, and the team; professional and enthusiastic. The Squadron began the year with its suite of readiness training culminating with Exercise Wallaby Walk. The Squadron exercises challenged our members with EOD scenarios that set the conditions for the remainder of the year. During this readiness period the Squadron had the opportunity to conduct joint interagency operations with the Australian Federal Police, RAAF's 65 Squadron, 1st Military Police Battalion and 1st Intelligence Battalion in order to further enhance our interoperability and further develop emerging capabilities.

The Squadron then committed to support the Joint Warfighting Series 19, through participating in the Sea series of exercises and Exercise Talisman Sabre with integrated EOD Support to the force elements participating in the largest military exercise to take place in Australia.



EOD Teams supported the Amphibious Task Group lodgement in the largest amphibious assault to occur since WWII. Further EOD assets supported the 1st and 7th Brigades and Headquarters 1st Division.

On a global front this year, 20 EOD SQN has provided flexible and enduring support to Operations Highroad, Okra and Augury and short notice EOD Team support to Operation Render Safe in Vanuatu and the Solomon Islands. The Squadron has also provided substantial support to international exercises and engagements including Rifle Company Butterworth - Malaysia, ASEAN Defence Ministers Meeting (ADMM) – Indonesia, Exercise Hydracrab - Guam, Exercise Ardent Defender – Canada and Exercise AUSTRAHIND – Townsville.

The final quarter of 2019 will see the Squadron shift focus to command Operation Render Safe 19 in support of the Government of Solomon Islands. This will see the Squadron sized contingent comprising members of 20 EOD SQN, 17 Construction Squadron, 1st Combat Engineer Regiment, RAAF, RAN Mine Clearance Team 1, New Zealand Defence Force and the Royal Solomon Islands Police Force to reduce Explosive Remnants of War across multiple islands in the north western provinces. On return from Operation Render Safe 19, the Squadron will close out the year by delivering an exported RAE EOD Module 3 course to support the Corps requirements for growth of the EOD capability.

As the Squadron looks to the future, it has not sat idle, and we have consistently championed the capabilities future. This has included Learning Module Package rewrites, doctrine reviews and informed capability acquisition to ensure the Squadron is postured for future and emerging threats. Finally the Squadron is looking forward to a well-earned stand down period prior to returning in 2020 with the establishment and raising of 3 EOD Troop to further support and enhance the capability and the Corps.

21 Construction Squadron – AACAP 2019, Jigalong CAPT Daniel Teys

This year 21 Construction Squadron deployed on AACAP 2019, Exercise Saunders 19, to the remote Aboriginal community of Jigalong, WA. The Exercise focuses along four lines of effort in support of the whole of government strategic effect of closing the gap, being; community engagement, training, health and construction effects. These effects are tailored to support the community's needs and are achieved through work by Nation Indigenous Australians Agency, 19 CE Works and the AACAP contingent.

This year AACAP deployed on two rotations each with 100 personnel, over the months of May to September. During this time members of 21 Construction Squadron, constructed an amenities area, ablutions block and enhanced access through the construction of two large culverts. Concurrently the community were provided accredited and non-accredited training and health effects by members of the wider Army. The deployment of the contingent demonstrated the Squadron's ability to deploy via road. This was a

considerable feat as Jigalong is 5,000 km from RAAF Base Amberley, taking ten days to drive each way.

Construction was broken into two works packages one for 6 ESR and a second for a civilian contractor, both under 19 CE Works. 21 Construction Squadron was responsible for the amenities area, an area for the community to gather to celebrate or meet, accompanied by an ablution block. The bulk of civil works were focussed on two creek crossing where culverts were laid to reduce the impact of wet season to the community. This was completed by two Troop rotations, over 4 months, constructing the camp and completing the works package. This was another demonstration of the determination of Sappers to succeed and positively influence the lives of others.

The health effects in the community revolved around the existing network of support provided by PAMS, a health organisation operating out of East Pilbara. The health contingent that deployed was complimented by a doctor, nurse, medics, dentist and a physiotherapist. Additionally, a veterinarian operated in the community for two weeks, providing support to many dogs in the community that are closely linked to the Martu



people's culture. The health team provided support to the community which normally requires community members to travel far from family and friends.

During the Exercise, Jigalong received training in construction, guiding and healthy lifestyles. While participating in a variety of community centred engagement, the AACAP personnel supported the community's AFL team; the Jigalong Eagles. This community link through sport allowed the Defence members to leave a positive legacy within the Jigalong Community.

The 21 Construction Squadron has showcased a great performance by its Sappers, who, through the determined application of their respective trades, have influenced the lives of the Jigalong community all across Australia.

The support of the attached assets cemented the habitual relationships between them and 6 ESR, ensuring the success of the programme for another year. AACAP again has demonstrated the importance of training, partnerships and preparedness as 21 Construction Squadron now shifts focus to the high-risk weather season.

Operational Support Squadron

CAPT Nathan Pagulayan

2019 has been an extremely busy year for Operational Support Squadron (OSS) at 6 ESR. From the beginning, we were swamped with induction training but managed to escape the barracks environment for Exercise Wolf Crawl. The Squadron shake out was a necessity to set the standard expected for the year once we commenced our dispersed operations. Despite our best efforts to get out the door, this was somewhat disrupted with the preparations to support the floods across Northern Australia. Analysis for this reduced our Operational Support Team (OST) to the basic necessities in order to satisfy load, space and personnel restrictions, yet still providing the logistic and maintenance support required. This reduced staff effort proved that a "task-organised, task-orientated" OST is the most effective way to conduct dispersed operations.

OSS has been required to support the sub-units across three different, and concurrent, Regimental activities: 21 Construction Squadron conducting AACAP in Jigalong, WA, 17 Construction Squadron conducting the Joint



Warfighting Series 19 at SWBTA and support to various 20 EOD operations – all the while ensuring rear details at Amberley was maintained to chip away at production and reduce backlog.

AACAP proved to be a logistical beast – more complex than it has ever been before. Getting vehicles (particularly L121 FOV), equipment, machinery, containers, stores and personnel 5000 kms away to Camp Birt, conducting logistical sustainment for four months and redeployment back to RAAF Amberley – safely – was no small problem set. Our logisticians and maintenance elements involved with the planning and execution have done OSS proud.

Support to Joint Warfighting Series 19 was provided by means of an OST who were organic to the Ready Construction Squadron, and were integrated throughout the “Crawl, Walk, Run” certification activities. Support was extended to the Engineer Task Group once the Regiment (-) deployed during Ex TALISMAN SABRE and OSS successfully established an Engineer Logistic Park which provided dispersed support to elements throughout SWBTA. Needless to say, OSS dominated the battlespace with the highest flying RAEME flag within the FSG AO. Some may say it was fit for a parade.

OSS is now deep into the Refit to Fight stage of all major activities but tempo has not reduced. We’ve switched focus to providing support to individual courses, involvement in the Indo-Pacific region and preparation for the High Risk Weather season, as we continue to support the force who enables the Joint Force to live, move and fight.

Conclusion

As the Regiment continues to focus on supporting the Joint Force we also continue to train a wide array of individual and collective specialist skills. These skills and the dedication demonstrated by the soldiers of the Regiment have been the cornerstone of their sustained, superior performance in 2019. The soldiers of the Regiment have once again demonstrated their ability to produce high quality work in demanding conditions and with limited resources.

We thank all the families and wider community for their continued support of an extraordinary group of men and women. You should be duly proud of your efforts.

17 Construction Squadron 70th Birthday

LT Leadbetter

17 Construction Squadron celebrated its 70th birthday this year, having been founded in 1949. On 20 September 2019, 6 Engineer Support Regiment unveiled its own memorial dedicated to honouring the memories of those members of the Regiment and other Construction Squadrons who paid the ultimate sacrifice for their country. The service was well attended and the memorial was unveiled by the Corps Colonel-Commandant MAJGEN Steve Day, and Mr Don and Mrs Linda Birt. As this service coincided with the 70th birthday of 17 Construction Squadron, many members of the 17 Construction Squadron Association were also in attendance. Many of these Sappers served across theatres of war such as Vietnam, Malaya and Afghanistan or other operations such as Namibia and East Timor.

The 70th birthday celebrations commenced with the cutting of the cake by Officer Commanding 17 Construction Squadron, MAJ Alex Buenen and the Squadron’s youngest member, SPR Cameron Gough. The Sappers of the Squadron presented a static capability display to showcase the equipment and capability they currently hold. The display included the new fleet of Land 121 vehicles, a selection of plant vehicles, the water purification and desalination system, the Regiment’s dive capability, Combat Engineer and trade displays. This provided the current members of 17 Construction Squadron a fantastic opportunity to engage with and learn from the vast experiences contained within the members of 17 Construction Squadron Association. This was a highlight of the day and the opportunity was appreciated by both former and current members of the squadron.

The association hosted a number of events at the Kedron-Wavell Services Club over the weekend, open to former and current members of the Squadron. The informal gathering, a formal dinner and final luncheon were well attended and allowed members past and present to engage and reconnect. It was humbling for the current members to learn from the experience of their predecessors and gratifying for them to see their torch being ably carried by the younger generations. The formal dinner held on the Saturday night was the stand out for all involved. 17 Construction Squadron provided the banner party for the dinner. The banner ensign was Squadron 2IC, CAPT Chicoutimi Done and the Banner Escorts were SGT Phillip Managrave and SGT Paul Thornhill. The celebrations were well-received by all and the Squadron looks forward to future engagement with the 17 Construction Squadron Association.

6th Engineer Regiment Memorial

WO1 Sean McAlinden

The 6th Engineer Support Regiment (6 ESR) conducted a memorial dedication service to unveil the Soldiers Memorial within the unit lines on RAAF Amberley. The service was conducted on Friday 20 September 2019, with Major General Stephen J Day, DSC, AM, the Representative Colonel Commandant Royal Australian Engineers, invited to unveil the memorial plaques, assisted by Linda and Don Birt, the parents of Corporal Ashley Birt who was killed in Afghanistan in 2011. Also in attendance was the Commander 6th Brigade, Brigadier Susan Coyle, CSC, DSM, Group Captain Ross Magno, representing the SADFO RAAF Amberley, and a strong contingent of former members, veterans and families of the Regiment.

The date of the service is significant for the RAE Corps, with 20 September 1949 the date of the formation of 17 Construction Squadron, who celebrate their 70th Anniversary. It was also the 20th Anniversary of INTERFET troops landing in East Timor in 1999, a date that is noteworthy for Major General Day, who was the CO of 3 CER at the time and who were part of those landing troops.

The Soldiers Memorial was built in the unit grounds by the sappers, craftsmen and women of 6 ESR. The memorial is placed in the centre of the unit compound, representing the emotional heart of the Regiment. A Heavy Equipment Bridge spans the gap from the working area to the memorial, leading to the paved area and gardens in a shape of the Christian cross. The focal point of the memorial is a sandstone block, upon which is mounted the RAE Corps Badge and the memorial plaques inscribed with the names of the fallen. Behind the memorial block are two Bailey Panels, the Bailey panel is the symbol of 6 ESR. Each panel is surmounted with a stainless steel cut-out, the panel on the left showing the outline of the countries unit members have served in, and the other, a group of World War I soldiers loaded with equipment and weapons, marching on a ridgeline, with a bugler calling them home for the evening.

Major General Steve Day DSC, AM unveils the 6th Engineer Support Regiment memorial with Corporal Ashley Birt's parents, Linda and Don Birt





6 Engineer Support Regiment memorial, dedicated to unit members who lost their lives

The brass plaques that record each name, and the memorial plaque, were graciously provided through a generous donation from the Sapper Fund. Without this kind gift from the Corps the memorial would not hold the same significance it does today. Corporal Todd Snowden, of 21 Construction Squadron, was responsible for the diligent research through the Australian War memorial archives to identify the names and details of those honoured on the memorial.



The names inscribed on the memorial commemorate those who lost their lives serving on operational duty. The memorial remembers two soldiers of 17 Construction Squadron who died as a result of service in South Vietnam, two soldiers from 21 Construction Squadron are remembered from their service in Borneo, three soldiers from 22 Construction Squadron are recorded on the memorial, having paid the ultimate sacrifice in service of their country in Papua New Guinea and Borneo, and Corporal Ashley Birt, who lost his life when killed serving in Afghanistan with the 1st Topographical Survey Squadron, then a sub-unit of 6 ESR.

[Sapper SITREP]

11th Engineer Regiment

LT James Petersen

11 ER started 2019 at full speed, with the Regiment Headquarters planning and executing the Regiment Shooting and Demolition weekends, as well as relocating its Headquarters from its existing location. This relocation to another building within Gallipoli Barracks required significant planning, with the building and compound needing major refurbishment. Whilst much of the work was carried out by Base Services, there was plenty of opportunity for the unit tradies to get their hands dirty. Despite the amount of work required for this move, it was conducted well ahead of schedule and with minimal disruption to training.

The range weekend was the first major exercise for the regiment, which tested everyone's individual skill-set on a number of weapon systems. The weekend was highly successful with members also being exposed to the new suite of range practices being rolled in from 2020.

In September 2019, the Regiment came together for an impressive show of 'Sappernuity'. With the fire danger reaching 'extreme' just days before the Ex Retrograde, the yearly demolition range practice was quickly transformed to focus on search, mine clearance and driver training. Plant Operators and Sappers also had the opportunity to work on several range remediation tasks in support of Range Control. The combat engineers conducted a bull ring of activities designed to build on and reinforce engineer base skills. At the demolitions range, plant operators fought the dust and remediated essential roads and tracks rotating through several simple scenarios designed to reinforce essential skills. Meanwhile, Troop commanders were given a series of reconnaissance tasks to develop their appreciation of engineer planning.

The final day of the activity saw the three Combat Engineer Troops tackle real-life base scenarios that tested the metal of Junior Officers and NCO's. These scenarios provided an environment where soldiers could experience the hardship and confusion of a rapidly deteriorating situation. The basic skills that were reinforced during this training are the essential building blocks for engineering capability. Sappers across the Regiment were exposed to their own personal knowledge gaps in a supportive training environment that successfully developed and improved the capability of the unit.

11th Combat Engineer Squadron

CAPT Philip Lawton

11 CES enjoyed a productive start to 2019 with Sappers honing core skills in combat shooting, live fire range activities and scenario-based search training. Members also attended the Brigade Course Period and 11 CES Sappers completed their W1 qualification, CBRND, white card, working at heights, UAV, plant and Infantry Footbridge System courses.

Now in READYING, 11 CES will shift focus to work towards supporting 3 CER at Ex HAMMEL in 2020. Leading up to this will be further RAE skill focused training exercises as well as lead up two-week exercises with 11 CES sending a TP to Ex BROLGA RUN in October.

Below left: CO 11ER LTCOL Jenkins addressing the Regiment at Tin Can Bay Training Area during Ex Retrograde.

Below: 11 CES Sappers prepare a log for use in obstacle construction during Ex Rapid Repair





Above: 11 CES Sappers working through the night to complete a log crib obstacle during Ex Rapid Repair

This image: CPL Verdouw's culvert worksite and CPL Lawley's road repair worksite during Ex Rapid Repair



Once again, Ex RAPID REPAIR has been a highlight for the Squadron with Sappers given the opportunity to get on the tools and hone their construction skills. Section Commanders and Junior Leaders were given the opportunity to practice their combat engineering planning and giving orders for section level work sites. The Squadron undertook concurrent tasks within Enoggera Training Area (ETA), which included road repairs and culvert construction. The Squadron was given the opportunity to design and construct a PMV obstacle course.

35th Combat Engineer Squadron

LT Mark Pollard

2019 started with a trial by water for Townsville, with the worst flooding in Townsville's history proving to be a test for many serving ADF members, as well as the wider community. The efforts of the Army throughout the heaviest flooding was seen on news screens around the country and these efforts continued well into the city's clean-up phase.

Members of 35 CES, some of whom had already volunteered in assisting flooded households in the immediate aftermath, joined the reservist contingent who worked with 3 CER to assist in the clean-up of the worst flood affected areas. It was an excellent opportunity to use the SQN capability of both expertise and material to assist in making the work move faster and more efficiently through the use of the LX120 and qualified drivers for the heavier vehicles. As life in Townsville tried to return to normal the Army Reserve training year also needed to pick up and carry on, and though the year has been interrupted, the training delivered has been enthusiastically attended.

Managing training and operations in a CES whose footprint stretches along more than 800km of Queensland's coastline is a challenge. 35 CES's training depots and footprint cover from Gladstone to Townsville. The Squadron plays a key role in engaging with and supporting communities throughout that footprint, with activities conducted in locations as diverse as Agnes Waters, Rockhampton, Mackay, Mount Morgan, Townsville, Shoalwater Bay and High Range Training Areas. We have also supported Regiment activities in Brisbane and Wide Bay Training Area.

The first major training weekend was a joint range weekend that was attended by both 2 Troop and 3 Troop who drove up to Townsville for a live fire shoot. The main range activity conducted on the Saturday saw a range of skills being tested and trained. Members who were not on the range firing underwent a bullring of activities which included navigation, knot tying skills, mine familiarisation and section attack SOPs. The weekend was capped off with a run through the obstacle course, which was an excellent test of teamwork.

35 CES was also able to serve on ANZAC Day, with members of 3 Troop providing the catafalque party to the town of Mt Morgan. 3 Troop primarily operates from Woolcock Depot in Rockhampton, with members being drawn from Rockhampton, Gladstone and the



Above (from left to right): CAPT Shakhovskoy is back briefed by LT Courneya and LT Ruff during Ex Retrograde.

Calliope Valley. The relative isolation of the Troop creates a challenge in coordinating training, however the Troop benefits from a close relationship with other 11 Brigade units in the Central Queensland region. The Troop also provided personnel to support Operation Resolute and was on standby to provide assistance during the Rockhampton bushfires in November-December 2018.

The construction skills of both troops has also been expanded. 2 Troop's construction training has been multi-faceted, while 3 Troop focused on a joint construction task with 31/42 RQR to improve the local base facilities. 2 Troop learned the employment and use of the Infantry Assault Bridge, examined the capability of the Lucas Portable Sawmill and re-familiarised on the Troop's chainsaws. 3 Troop's task was to be involved in the planning and construction of an extension to the John Henry Mann DCM Mess, which is still progressing.

Both Troops were drawn together again for the 11 ER demolitions weekend, which due to fire restrictions turned into an excellent skill building weekend. This saw Sappers, NCO's and Officers training in a variety of skills to culminate in the completion of three very different complex tasks. 35 CES members acquitted themselves well, displaying a high level of capability and experience in the areas of search, demolitions and IMTs.

As the year progresses 35 CES still has its search skill set to expand and test in November. This will flow into preparation for the NQ cyclone season and being ready to see what next year will have in store.

104th Construction Squadron

MAJ Ben Gyetvay

It has been a busy and productive year at 104 CS. Plant and Transport Troop has been busy conducting road and track repair, culvert/drainage works, route denial through obstacle emplacement, and general range refurbishment at both Enoggera and Greenbank training areas. Construction and Resources Troop activities included the building of multiple targets for the Combat Shooting Course and demolitions training activities, whilst also conducting minor works around the Mask Testing Facility (gas hut).

In June, 104 CS successfully delivered another single code plant course, qualifying several members in Skid Steer Loader, JD 450 and PC 50 plant equipment. Other training for 104 CS Sappers included conversion to the EF88, 9mm and GLA; Army First Aid; Working Safety at Heights; Confined Space Safety; Civil Forklift; G-Wagon conversion; CBNRD; and Small Boat Operations.

104 CS also supported ADF operations and activities, which included CPL Krasevskis deploying on Op ACCORDION; trade support to Ex PUK PUK and AACAP; plant operators assisting 6 ESR at Wide Bay; NCO instructor support to the School of Military Engineering and support to the ADF Army Cadet training in South East QLD.

The Sqn continues liaison and plan with sub-contractors on the refurbishment of Ipswich Depot, which is expected to commence in early 2020. The refurbishment will provide additional facilities for the Sqn to operate out of when parading at Ipswich.

Member from Plant Troop undertaking remediation works at the demolition range at Tin Can Bay.



[Sapper SITREP]

19th Chief Engineer Works

LTCOL Karl Reynolds

'Plan, Design, Deliver'

There is considerable excitement building within the RAE construction capability as major infrastructure projects commence in earnest to support domestic, regional and global operations and activities. For 19 CE Works, much has happened this year and the tempo of activities has increased significantly.

As a small specialist unit, 19 CE Works has again established a niche for itself in support of a whole-of-government action plan in the region and established a reputation as a valuable and professional engineer capability.

In 2019, 19 CE Works embarked on its largest ever programme of works. The total value of project budgets increasing by over 1000% on 2018 values. This increase in regional engagement and infrastructure delivery responsibilities triggered an expansion to 19 CE Works in January 2019. New positions were created increasing the unit establishment by 40% and included an additional Works Section and key enabling staff. The unit has continued to support operations in the Middle East Region. Domestically, 19 CE Works has for 23 consecutive years now supported the Army's indigenous engagement strategy through the Army Aboriginal Community Assistance Programme (AACAP). 19 CE Works continues to be a recognised leader in delivering infrastructure projects for a strategic effect.

This year has also seen the development and continuous improvement of 19 CE Works capabilities through a number of modernisation initiatives. The unit has implemented a new Business Management System, integrated new construction project management tools and adopted new software and hardware for survey and draughting capabilities. These force modernisation initiatives ensure 19 CE Works is able to take on larger infrastructure projects, continue improving our levels of professionalism, and ensure the capability is ready now whilst preparing to be future ready.

2019 set a new benchmark for infrastructure projects delivered by 19 CE Works. 2020 promises to be another exciting and challenging year. I am more than confident that the unit will be equal to the task. My congratulations and thanks to all members of the unit and their families for their commitment, hard-work and

achievements this year. In particular, a special mention to Mark Carolan who departed 19 CE Works in August after 15 years of providing valuable financial management advice and support to the unit. He has transferred to another position in the Defence Department.

You can keep up to date with the activities of 19 CE Works on our Facebook page or on Twitter @19CEWorks.

Ubique

198 Works Section

Support to Operations – Middle East Region

19 CE Works continues its support to operations in the Middle East Region (MER), filling the full range of positions in the HQ JTF 633 Engineer Support Element (ESE). The engineer team truly is everywhere across the MER. Dispersed across Afghanistan, Iraq and the United Arab Emirates, the ESE delivers facilities and infrastructure projects in support of the Joint Force, coalition and interagency partners. The ESE comprises a headquarters element, four Project Management Teams (PMT), an Engineer Construction Team (ECT) and a Camp Maintenance Team (CMT).

Throughout 2019, 19 CE Works deployed many unit members on operations: Majors Greg Barrowcliff, Andrew Oxlade and Ian Lobb (Officer Commanding/Senior Project Engineers); Captains Tim Doust, Amrinder Ghuman, Scott Atkinson and Tom Close (Project Engineers); Warrant Officers Class One Richard Hall and Kelvin Baulch (Works Managers); Sergeant Jamie Millar and Warrant Officer Class Two Liam Wardle (Works Supervisors); and Sapper Kurt Moroney and Lance Corporal Tim Kesby (Draughtsmen).

In addition to 19 CE Works' and 6 ESR's contribution, the ESE comprises engineers and construction trades from a range of RAE and RAAF units, drawing upon skills and expertise from the full-time and part-time workforce. This joint construction engineering capability is enabled through the integration and interoperability of its team members.

Whilst supporting deployed forces in Iraq and Afghanistan, HQ ESE and the UAE based Project Management Teams continued planning and delivering essential enabling works in Al Minhad and Al Dhafra as part of Operation Accordion.

Operation OKRA – Iraq

CAPT Tom Close

Project Management Team Alpha (PMT-A) provided ongoing construction support to Task Group 632 (TG632), Task Group Taji and other ADF elements throughout Iraq. Captain Thomas Close and Sergeant Shaun Walsh (6ESR) continued the work of Captain Amrinder Ghuman and Sergeant James Newcombe (6 ESR) from the previous rotation. PMT-A was strongly supported by the six-man ECT led by Corporal Cameron van de Laarschot (Dutchie) and later CPL Matthew Wrench (both 6ESR). Together PMT-A and the ECT enabled TG632's operations with their Iraqi Partner Force in Baghdad by providing improved working accommodation, facilities maintenance and combat training aids. The Australian working relationships with both Iraqi Security Force and Coalition Force elements was also enhanced through the provision of technical design and trade advice. This required multiple reconnaissance and design tasks throughout all major bases within Iraq. The ESE has provided construction support in Iraq since Operation OKRA began.

Bottom: Sapper Jared Gard and Sapper Johnathon Whitehead and an Iraqi counterpart; a small recon team from the ECT inspect the Counter Terrorism Command Headquarters building which was partially destroyed in 2003.



Operation HIGHROAD – Afghanistan

CAPT Scott Atkinson

PMT-B continues to provide the sole Australian construction and force protection engineer support to TG Afghanistan and the Coalition. The Marshal Fahim National Defence University now has multiple sporting facilities and an amenities precinct to support the core training area for the Afghan National Army (ANA). Training capacity is being developed through a revised training area extension and associated security scoped for construction. The enabling ANA logistics facilities have been scoped for remediation and enhancement to support increased training. Coalition and ANA security has been enhanced following PMT-B design and delivery of entry points in Kandahar Airfield and Kabul. The final months of 2019 will see the forward engineer support replace key TG Afghanistan infrastructure for communications.

Below: Participants in PMT-B discussions with the ANA Garrison Support Unit.

Bottom: PMT-B conducts pre-pour inspection of works.



by Army (19 CE Works, 6 ESR, and other 6 Bde and 17 Bde supporting elements). The intent of the program is to provide long lasting benefits and development to communities in need through health and training programs, supported by infrastructure development. Additionally, it provides Army with effective training that can be translated into other Corps applications such as Humanitarian Assistance and Disaster Relief (HADR).

2019 has been a busy year for 11 Works Section which has been responsible for the management of six AACAP Projects, an additional indigenous engagement project in Borroloola – Northern Territory and ongoing support to overseas operations. Although a high tempo 12 months, there has been some excellent success with the closure of Yalata (2018) and Toomelah (2017) AACAPs this year. Additionally, there has been the successful delivery of works for AACAP 2019 in Jigalong and the delivery of 8 of 12 houses to the Borroloola Community – Northern Territory.

AACAP19 – Jigalong, Western Australia

This year AACAP was held in the WA community of Jigalong (approx 1.5 h east of Newman), seeing 19 CE Wks supervising the delivery of two works packages. Works Package A was delivered by 21 Construction Squadron, 6 ESR and consisted of two culvert creek crossings and a community space comprising an ablutions block and BBQ Area. Works Package B was a contractor delivered multi-purpose facility for youth and early family support services.

Due to a condensed planning timeframe, the team was under extreme time pressure from the outset requiring an expedited approval process, causing a few grey hairs; however, with dogged determination CAPT Ian Brooks (21 Const Sqn), CAPT Tom Close, CAPT Daniel Foley and the PMT were able to bring everything together just in time. Although off to a shaky start, the team led by CAPT Dan Foley and supported by WO2 Rod Smith, WO2 Paul Thompson, CAPT David Sondergeld (ARES) and WO1 Gary Lewis (ARES) rallied and saw AACAP commencing on time without delay.

Notwithstanding the initial challenges, delivery of the works packages was achieved with only minor issues during construction. 6 ESR performed well, and the team as a whole were able to deliver both Works packages on time to an excellent standard that would bring long-term community benefit. A big congratulations and thanks to CAPT Foley and the team for their efforts, it was an excellent performance to carry out this AACAP, despite some genuine challenges.



Images from top: WO2 Paul Thompson conducting a level 4 inspection, checking heights and spacing of a Box Culvert wearing course reinforcement and formwork in Jigalong WA; WO2 Rodney Smith working with LCPL Ty Fergus from 6 ESR to tie in the box culvert wing walls with the road wearing course while civil works are being finished in the background; 19 Chief Engineer Works Project Management Team with representatives from Parakeelya Architects and Construction management outside the Youth Centre which they designed and delivered in Jigalong. The centre will provide a brand new community space for child and after school care in the community.

AACAP 20 – Pormpuraaw, Far North Queensland

AACAP 20 was announced in March this year awarding the program to the community of Pormpuraaw, located on the Western Cape of QLD, approximately 200km south of Weipa. Unfortunately the announcement was delayed, which, much like 2019, condensed the planning timeframe and put the PMT under pressure to meet the development schedule. Nevertheless, CAPT Craig Ashburner and CAPT Krystian Havlin supported by WO2 Liam Wardle and SGT Jamie Millar, were able to accelerate development and win back time to support 6 ESR to plan their delivery. Extensive community and local government discussion has reached agreement to undertake a works package comprising a small gated living facility for the elderly, a men's shed and land subdivision. Planning is progressing well, with consultation occurring with 6 ESR as well as Health and Training Development support. With all key players already engaged and the statement of works ready for full development, the delivery in 2020 is shaping towards a good outcome.

Borroloola Housing Project, Northern Territory

In the latter stages of 2018 the Australian Government announced that they would rapidly deliver 22 houses to the Township of Borroloola. As a result, 11 Works Section has undertaken this task, planning to deliver 5 houses each for Mara, Yanyula, Garawa 1 and Garawa 2 town camps, and two located centrally. The Project has encountered numerous challenges including gaining land owner consent, development approvals, building in flood prone areas, and a lack of existing services infrastructure. However, these issues are all close to being resolved with the intention of practical completion being met in early 2020. Tiwi Partners, a Darwin based Construction Company were contracted to deliver the works and have been excellent in their support to its delivery. CAPT Jonathan Glover and WO2 Darren King have been working tirelessly with NIAA-Head office, NIAA-Regional as well as NT Government to find a positive resolution with long awaited success for the Project in sight.



Rear: Keith Barney, Leah Simmons, George Conrad, Tim Koo-Aga, Jamie Satani, SGT Jamie Millar, Bert Edwards. Front: Edward Natera, CAPT Krystian Havlin.

AACAP21 – TBA, Northern Territory

AACAP 21 has hit the radar with a feasibility study undertaken by NIAA and Army in a number of remote communities in the Central Territory and Arnhem Land. Notably all communities demonstrated a need with three communities being recommended to NIAA as the successful 2021 bid. Communities visited were Maningrida, Ampilatwatja, Yirrkala, Gapuwiyak and Banyala.

It is expected that the successful community will be announced in the later stages of 2019, which will support a full inception and development cycle in 2020. With this likely to occur, it is anticipated at this very early stage that AACAP 21 is on track and looks promising.

Three of the new houses nearing completion in the town camp of Garawa 1, Borroloola.

Completion handover for one of the new houses, CAPT Jonathan Glover, WO1 Richard Hicks, NIAA rep, Building Crew



Concluding Remarks

11 Works Section has had a very busy year, continuing to effectively deliver challenging projects, with culturally varied stakeholders. A large thankyou goes to those who have supported our works, which includes NIAA-Head Office, NIAA-Regional (QLD/WA/NT) and the other supporting agencies that have assisted in ensuring AACAP success continues. Special mention to Ms Lori Richardson and Rochelle Dennis, for their individual support for AACAP and the Borroloola Project. Finally, the works performed by the Section has been of excellent quality, and as the SPE I couldn't have asked for better.



CAPT Mat Jetson, CAPT Gerard Koen, WO1 Pete Gardiner, inspecting earth works conducted by and local contractors as part of the Blackrock Camp Project, Fiji.



Top: Site tour and conducting a site visit at Blackrock Camp, MAJ Michael Sipple, Minister for Foreign Affairs Marise Payne, CAPT Gerard Koen, and CAPT Mathew Jetson.

Above: Site tour of works underway at Blackrock Camp, SGT Chris Renew briefing the Chief of Army LTGEN Rick Burr, AO, DSC, MVO and RSM Army WO1 Grant McFarlane, OAM.

12 Works Section

MAJ Mick Sipple

Enhanced Pacific Engagement – Fiji and Vanuatu

12 Works Section has been intimately involved in the whole-of-government Pacific Step Up. The Section has established strong working relationships with International Policy Division (IP Div), industry, and our regional partners to rapidly deliver facilities and infrastructure in Fiji and Vanuatu. 12 Works Section has continuously involved our Fijian and Ni-Vanuatu partners to ensure the projects meet their specific requirements. This will ensure the projects are fit for purpose, maximise local participation during construction, are environmentally friendly, and maintainable. The projects have allowed 19 CE Works to form strong friendships and working relationships with our regional neighbours.

Blackrock Camp, Fiji

CAPT Gerard Koen

In August 2018, the Australian and Fijian Governments jointly announced that Australia would support Fiji to redevelop its Blackrock Peacekeeping and Humanitarian Assistance and Disaster Relief Camp into a regional hub for peacekeeping training and pre-deployment preparation.

This project is the single largest project 19 CE Works has been tasked to deliver in terms of project value and complexity. Working in close collaboration with IP Div and other key stakeholders within Fiji and Australia, the Project Management Team quickly got to work and arrived at an agreed design with the Design

Services Consultant, GHD. The design philosophy focused on Environmentally Sustainable Design (ESD) principles, while considering Whole of Life (WOL) costs and local industry opportunities and capabilities.

Key scope of work items include a HADR/Logistic precinct, a UN Pre-Deployment School, Medical Facility and living accommodation for 148 personnel. The image below contains QR codes that can be scanned to view 3D renders of key buildings as seen on the ground.

Concurrent to design development for the Main Works Package, members of the project team were required on-site to supervise the successful delivery of the Early Works Package, awarded to local contractors in April 2019. This package included the delivery of perimeter fence upgrades and bulk civil works to shape the site up to subgrade level in preparation for the Main Works contractor to complete the works.

CAPT Mat Jetson and CAPT Gerard Koen led the project team, with WO1 Pete Gardiner, WO2 Kit Turner, SGT Seaton Williamson, and SGT Chris Renew supervising the construction. It was extremely impressive to see the Works Supervisors draw from previous domestic and operational experiences to work on-site in Fiji autonomously and to a high standard. A project of

this scale also required valuable assistance by several other team members within the unit, as well as 19 CE Works ARES technical expertise to support the rapid development and high tempo demands of the project.

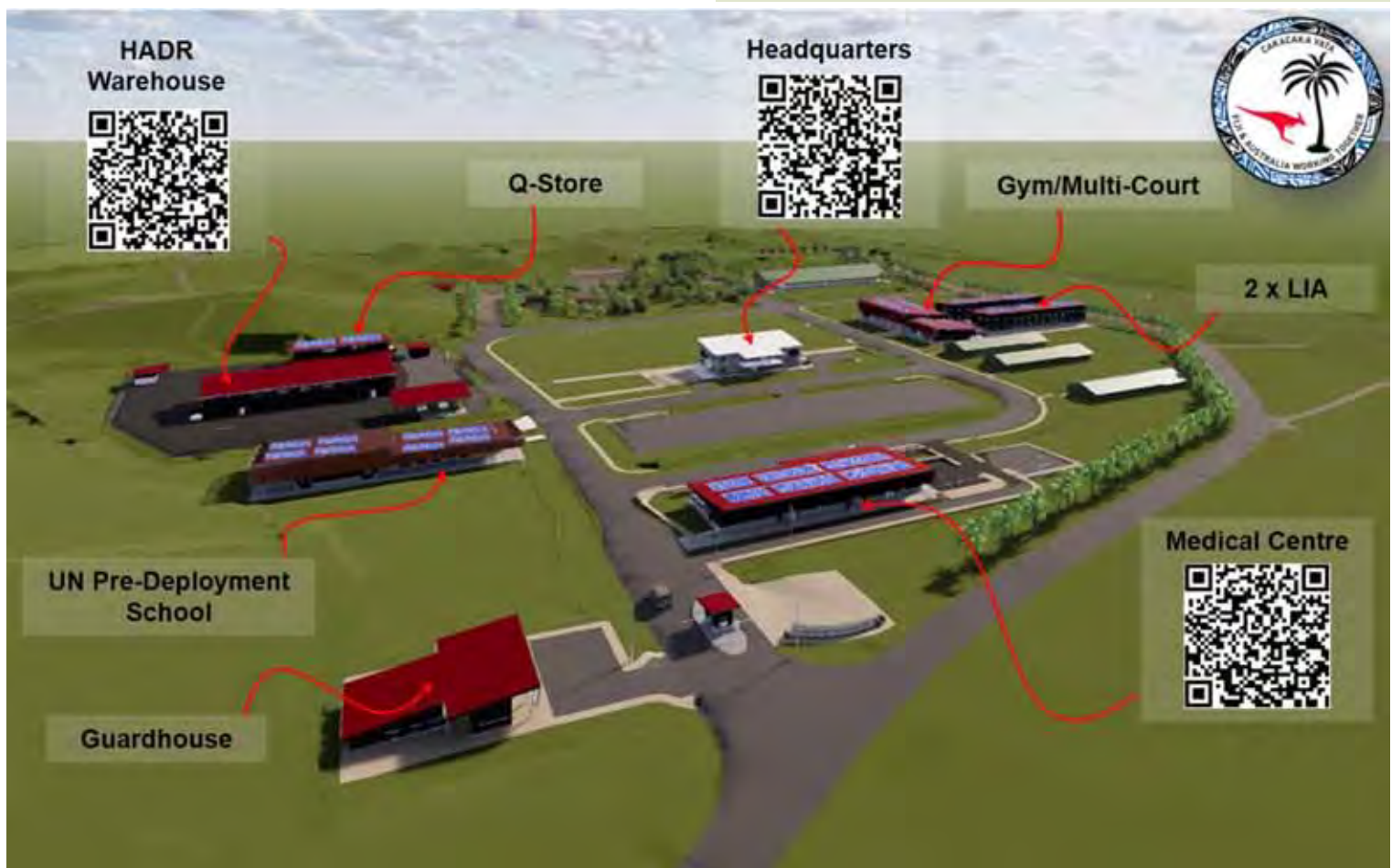
In August 2019, the Main Works Package contract was awarded to CC Pines Pty Ltd. To manage this package, the project team will maintain on-site presence with a Project Engineer and Works Supervisor on approximately two-month rotations until the works are completed in December 2020.

The redevelopment of Blackrock Camp is a significant component of Defence’s enhanced engagement in the Pacific region and will provide Fiji with world-class infrastructure to support their HADR capability and peacekeeping training.

Key Facts

- Construction period April 2019 to December 2020
- FJ\$40m (A\$28m) into the local economy
- 555 local jobs created

3D render of the future Blackrock Peacekeeping and Humanitarian Assistance and Disaster Relief Camp. QR codes can be scanned to view buildings as if on site.



Cook & Tiroas Barracks Infrastructure Works, Vanuatu

CAPT Tim Doust

In October 2018, Australia made an offer to the Government of Vanuatu for significant infrastructure upgrades at Cook Barracks (Port Vila) and Tiroas Barracks (Luganville). These upgrades will provide the Vanuatu Mobile Force (VMF) with new, modern facilities for the purpose of enhancing capability including operations and training.

The scope of works at Cook Barracks involves a full-scale redevelopment of the base including demolition of buildings beyond economic repair, refurbishment of existing buildings, and construction of a large number of new facilities. All of these are underpinned by a site-wide infrastructure upgrade including a sealed road network, new power and water infrastructure, and a modernised wastewater treatment facility.

At Tiroas Barracks, the scope is limited to a new magazine, armoury and medical facility at the present time. These will allow for safe storage of weapons and ammunition as well as an improved capacity to provide medical treatment to members of the VMF and the local community. IP Div in consultation with 19 CE Works is investigating options for future investment at Tiroas Barracks to continue the positive outcomes already achieved.

The 19 CE Works Project Management Team has worked with the VMF, GHD (Design Services Consultant) and other Vanuatu-based stakeholders to develop designs for the project. These will be finalised in early 2020 and enable the procurement of a construction contractor for the upgrade works, scheduled to commence in June 2020. Completion of the project is scheduled for mid-2022.

Briefing the CO VMF on the designs for the new look Cook and Tiroas Barracks, CAPT Callum Johnston and the Vanuatu Project Team, Commanding Officer VMF.



18 Works Section

MAJ Andrew Hansell

18 Works Section was established in January 2019 as a result of the current and future workload being undertaken by 19 CE Works. The Section assumed the PNG portfolio from 12 Works Section and undertook additional tasks as part of Australia's Pacific Step-Up. Existing tasks were the Infrastructure Audit, Air Movements Facility, and the closure phase of Halivim Poroman 6 – a 100-person two-storey accommodation block built for the PNGDF at Moem Barracks, Wewak.

Infrastructure Audit

During 2018, 19 CE Works was undertaking an assessment of the PNGDF infrastructure in Port Moresby (POM) in order to gain an understanding of the state of repair, generate a database, and to develop a remediation plan for future planning effort. Whilst assessments had been carried out for discrete tasks, no in-depth assessment on this level had been attempted before by 19 CE Works. A study of existing assessment models was undertaken identifying a Victorian health system model as appropriate for modification and use. Standardised templates were developed for rapidly assessing building condition, structure and services, as well as major service networks (water, sewerage and electrical). Members from 19 CE Works (CAPT Scott Atkinson, WO2 Greg Buckley, SPR Warwick Cox, SPR Tim Kesby), with support from 6 ESR deployed to POM for four weeks to carry out the assessment. The standalone database was completed in December 2018 and is an interactive program that enables users to rapidly find individual buildings and its associated templates, plans, imagery and assessments. 2019 saw the finalisation of this task and the handover of the database to project stakeholders, as well as briefings to other engineering units to advise them of the database, and for their professional development. The assessment highlighted that the original designs built in the early 1960's were fit-for-purpose as they far exceeded their design life despite very limited maintenance. The database will aid in the selection of future maintenance tasks whilst the assessment model provides a robust template for similar activities in the future.

Air Movements Facility

2019 also saw the completion of the delivery of the Air Movements Facility (AMF) at Jacksons International Airport, POM. The AMF provides a logistics hub for ADF exercises and operations in PNG. The project was not without challenges with stakeholders and local authorities ever



View during construction of the Project 206 Air Movements Facility build with Jacksons Field Airport in the background, WO2 G Turner, SGT William Bridges, Steve Wright - L&A Construction



Top: View of Lombrum Naval Base (HMPNGS Tarangau), looking over the technical areas towards Los Negros and Manus Islands.

Above: Personnel from PNGDF, DCP PNG, 19 CE Wks, GHD participating in the Design review for the Lombrum.

changing their requirements. 18 Works Section was able to achieve completion on 18 Apr 19 and the facility was handed over to the Defence Cooperation Program (DCP) RAAF personnel. Individual works supervision rotations were conducted by 19 CE Works' members WO2 Kit Turner, WO2 Daryl Coady, CPL Jakob Marek, with additional support from 5 ER's SGT William Bridges. There were several lessons learnt from the AMF Project that helped with development of the Lombrum Infrastructure Project.

Lombrum Infrastructure Project

By far 18 Works Section's largest project, the Lombrum Infrastructure Project is a joint initiative project between the Australian and PNG Governments to redevelop the Lombrum Naval Base located on Manus Island. The aim of the project is to restore and enhance sovereign capability and to allow the PNGDF to maintain security operations throughout the area. The Base was first commissioned by the United States Navy in 1944 once the island was taken back from the Japanese in the latter stages of WWII. Following the war the base was operated by the RAN until it was handed over to PNGDF as part of PNG's independence. The Base is now home to HMPNGS Tarangau, supporting three Pacific Class Patrol Boats and one new Guardian Class Patrol Boat.

18 Works Section led the initial development of the programme of works for the Infrastructure Project. This involved the creation of the Base Development Plan and the design development of the full programme of works. 18 Works Section has continued with the design development and delivery of the Early Works component of the programme only, with site activity scheduled to begin in Nov 19. These initial works aim to establish the initial security and base life support infrastructure whilst the remainder of the works programme continues to be developed for delivery from 2020 onwards.

Force Protection Engineering (FPE)

MAJ Andrew Hansell

FPE remains a small, yet important capability for 19 CE Works. This year saw the unit involved in the delivery of the Weapons Effects and FPE Course (WEFPEC) at SME, and attendance on the Royal Engineers FPE Course at the Defence Academy of the United Kingdom. The unit was also involved in the delivery of Vulnerability and Protection Options (VAPO) software training, which was coordinated and enabled by Defence Science & Technology Group. This powerful computer tool is quite an addition to the FPE practitioner's toolbox, enabling the conduct assessments of various threat scenarios in a much shorter timeframe.

19 CE Works continued its involvement in the International Physical Security Forum, this year held in Oslo, Norway.

The Forum continues to be a key networking activity to enable links between international partners in order to promote knowledge sharing and research collaboration. In September the unit hosted the annual Australian FPE Seminar. The two-day professional forum brought together a range of participants from Defence, Federal and State Government agencies, academia, industry, and international partners from the United Kingdom, the Netherlands, and New Zealand. The Seminar has provided further engagement opportunities with the Netherlands and the NSW Government that would benefit deployed electrical generation and the conduct of structural assessments. The presentations are located on the 19 CE Works SharePoint page.

201 Works Section

MAJ Greg Barrowcliff

2019 has been a busy year for 201 Works Section. In addition to the OC completing a deployment as HQ JTF633 ESE SPE, the section's members have provided ongoing support to unit projects and to Construction Project Management System (CPMS) project audits.

The principal support has consisted of: Captain Matt Jesson's involvement in design reviews and tender selection for Blackrock Camp Fiji, and design reviews for Manus Island and Vanuatu, Captain Astrid Hagqvists's support to Manus Island design reviews and a tender assessment, Captain Dave Sondegeld's stint as the site engineer at AACAP 19, Jigalong, and Manus Island design reviews, and WO1 Gary Lewis' multiple tours at Jigalong as the site works supervisor.

WO1 Mick Papay has continued to act as the Deputy Quality Assurance Manager as well as fulfilling the role of section Works Manager, and we have welcomed SGT Stu Cameron on board after his transfer from the ARA in April. Stu has become our 'go-to' man for project audits.

With a likely increase in unit establishment, the unit is looking for additional ARES project engineers and supervisors and enquiries regarding posting options are always welcome.

Unit Operations and Technical Support

MAJ Nikki Orr

The year has been a busy one for the operations cell, logistic and tech support section. With the recent unit growth we had posted in our own Information systems and Multimedia soldiers as well as an Information Sergeant to oversee the increased asset and capability. The Draughting

and Survey sections have been kept busy in the South West Pacific as well as AACAP 19 & 20. Along with the usual operations work the Cell was excited to stand up our drone capability (light and heavy) along with significant software and hardware upgrades for the draughtsmen. Moving forward the cell will be introducing virtual reality to our design packages as well as using modern data sharing platforms for our design and survey work.

Draughting Section

CPL Jake Marek

The 19 CE Works Draughting section has been involved in several activities this year including planning for AACAP, projects in the South West Pacific, and deployments to the Middle East as part of the Engineer Support Element.

The upcoming AACAP 2020 in Pomppuraaw, QLD saw SPR Andrew Davies engaging with the local community and government authorities to discuss the proposed men's shed and independent living facility. Through concept design packages and 3D modelling, he was able to communicate the proposed design options in order to develop the most suitable solution for the community.

SPR Glynn Stewart and SPR Troy Roseman had the opportunity to complete a professional secondment with GHD Australia's Structural Design Sector for the Vanuatu Infrastructure Works Project. During the secondment they completed 50% Structural Designs of a proposed Engineer's Workshop for the Vanuatu Mobile Force at Cook Barracks. Working with external consultants exposes our team to more complex design projects and up-to-date processes that have the potential to be integrated back at the unit.

One of the newest members of the team, SPR Kurt Moroney, a recent transfer from reserves has returned from deployment this year. As part of JTF633 Engineer Support Element, he provided technical design support to the project management teams and civilian contractors throughout the MER. He designed several projects for United States and Dutch forces and worked alongside military engineering teams from the United Kingdom and Italy.

Survey Section

LCPL Warwick Cox

The 19 CE Works Survey Section had a busy year providing support to Operation Southern Discovery and a number of projects throughout Australia and PNG for AACAP and the Lombrum Naval Base Infrastructure Project.



SGT Glen Piper and CPL Bradley Smart conducting feature survey of new development site.

The year started with CPL Brad Smart deployed on OP Southern Discovery 18/19, providing survey support to the Australian Antarctic Division (AAD) in the vicinity of Davis Station and an additional surveying task at Mawson Station, Antarctica. The remaining member of the Survey Section, LCPL Warwick Cox began providing support to the Borroloora Phase 2 Site Survey and a reconnaissance survey for the inception phase of AACAP 20 at Pormpuraaw (Far-North Queensland). Data collected during these surveys assisted with design works and volumetrics for the projects. 19 CE Works surveyors were also sent to Jigalong (Western Australia) to conduct a conformance survey during the delivery phase of AACAP 19.

During the second half of the year, Survey members successfully completed promotion courses and provided further support to projects such as a feature survey at Lombrum Naval Base, Manus Island. This survey was conducted in August with CPL Brad Smart and SGT Glen Piper (Supervisor Construction Information) for the IP-DIV Infrastructure Project early works phase.

OP Southern Discovery – Antarctica

CPL Bradley Smart

During the Austral Summer of 2018/19, CPL Brad Smart (19 CE Works) and LCPL Mathew Van Rees Hoets (6 ESR) provided survey support to the Australian Antarctic Division (AAD) during the 72nd ANARE (Australian National Antarctic Research Expedition). Aircraft access to and from Antarctica is currently only possible during the Austral Summer season. The Year-Round-Aviation-Access (YRAA) project intends to implement a concrete paved runway at Davis Station – the first sealed runway in Antarctica. The survey data acquired was essential for engineering design, cost estimates, and environmental impact assessments which has now been used to inform a decision on the feasibility of developing the runway at Davis Station under the Australian Antarctic Strategy and 20 Year Action Plan.



CPL Bradley Smart surveying inception phase of a new runway for Mawson Station.

CPL Bradley Smart surveying inception phase of a new runway for Davis Station.

All works for this project was conducted on the Vestfold Ridge, approximately 7km North-East of Davis. The centreline for the runway was marked out using star pickets and large traffic cones so that the alignment could be visualised from the air. A ground monitoring survey was conducted across a major valley the runway alignment is designed through. Steel spikes were staked-out across the valley and surveyed at the top and bottom to capture movement between the permafrost and sediment during the short summer season.

Modernisation work for the Strategic Infrastructure Project (SIP) required survey data for the new icebreaker ship *RSV Nuyina* at both Mawson and Davis Stations. This comprised a feature survey around the wharf areas at Mawson research station and Davis research station. An additional survey of the proposed shipping container laydown area at Davis further enhanced Australia's commitment to a new era of Antarctic endeavour.

The equipment used was a Trimble R8 GNSS Real Time Kinematic (RTK) system and Trimble S6 Total Station TLSS (Terrestrial Land Survey Systems) kit. RTK was utilised for all feature surveys and the centreline alignment setout. The TLSS S6 was used for the sediment movement control survey utilising direct reflectorless (DR) high precision LASER EDM (electronic distance measurement).

[Sapper SITREP]

22nd Engineer Regiment

LTCOL Sharon Coates

22 ER began a busy year with the CO's commencement activity for officers and senior NCOs at our depot at Newborough in the Latrobe Valley. This provided a good opportunity to better understand the location and come to grips with the requirements of a busy Ready year.

April saw 105 Constr Sqn's first construction block for the year. With support from members of 203 Works, 105 CS conducted multiple single code plant courses; improving the unit's number of multi-coded plant operators who then put those skills to use upgrading a section of Walker's Track on the southern end of Puckapunyal Range. At the same time, vertical construction skills were tested and developed in the upgrade of the Puckapunyal Engineer Compound with the construction of a small multi-purpose Lysaght and the improvement of electrical infrastructure on the large hangar.

The Combat Engineer Squadrons (8 CES and 10 CES) commenced 2019 with a section-level patrolling and infantry minor tactics weekend in the hot dry March at Puckapunyal and further developed these individual skills with hand grenade training, a live fire rifle range weekend in June and the technical puzzle and enjoyment of the demolitions weekend.

ANZAC Day 2019 was a long day, commencing with a Dawn Service at Ringwood Barracks followed by a rapid move into the Melbourne CBD to march, as part of 4 Bde, to the Shrine of Remembrance. As well as providing catafalque parties in Ringwood, Oakleigh and the Latrobe Valley, 22 ER had the honour of providing the catafalque party for the ANZAC Day Collingwood V Essendon AFL game at the MCG.

The road to Ex Talisman Sabre commenced in March with a section of combat engineers driving to Adelaide to link up with 3 Fd Sqn and continue on to Cultana Training Area to conduct training with 1 CER on Ex Goanna Walk. The exercise became a good opportunity to coordinate with the engineer units that would come together for Ex TS 19 and work on combat engineer skills, especially those that SERCAT 5 units do not have the regular opportunity to practice.

In July, after a long road self deployment from Melbourne, through rural NSW and Brisbane to Rockhampton, with our Land Rovers, Unimogs and Macks definitely showing their age, Exercise Talisman Sabre saw a combined squadron from 22 ER and 3 Fd Sqn (South Australia) support 1 CER and 1 Bde in the field in Shoal Water Bay. Construction engineers were integrated into 23 support Squadron while combat engineers worked under command OC 3 Fd Sqn as an independent sub-unit of 1 CER.

In September, Combat Engineers conducted a white role Engineer Search exercise (Ex SPUR WINTHROP) working with South East Water, one of Melbourne's water utilities. This exercise was an opportunity to move out of the sterile exercise environment of Puckapunyal and work on site at water storage facilities in Dromana and Sorrento on the Mornington Peninsula. This required sappers to consider the difficulties of search in real environments and working with organisations whose purpose and considerations were different to our own. The preceding weeks of reconnaissance and search training meant that successful searches were conducted by both teams.

As part of the Army Indigenous Liaison program 22 ER supported the Worawa Aboriginal College sports day. We have had the opportunity to work with the College to construct a cultural dance area, basketball court and beach volleyball court. Working with the College has been a wonderful experience for both the soldiers and the College students.

4 Bde ended the training year with Ex SOUTHERN MAGPIE, a nine day Domestic Incident Security Force (DISFOR) training exercise in support of HQJOC and Victoria Police at the Loy Yang power stations in the Latrobe Valley. 22 ER provided one of three troops to support the exercise, commencing with RSO&I training at Simpson Barracks before deploying to Loy Yang where integration with Victoria Police members in a range of scenarios including all-corps vehicle and building searches and asset protection occurred. Consideration





of requirements, planning and walking through the concept for each activity was deliberate but effective in demonstrating to Victoria Police what could be done with Defence assistance in each scenario.

CAPT Lachlan Wallace, CAPT Christian Chessman, SGT Scott White and SPR Harley Bolis deployed to the MEAO while WO2 David Ryan supported a multi-national exercise, Ex BALIKATAN, in the Philippines. 22 supported 6 ESR by sending two SERCAT 5 tradespeople on ACAAP – SPR Bryce Frattin for three months and SPR Paul Falzon for six months to the north of Western Australia.

22 ER had a number of members represent the unit for sporting completions. SPR Phoebe Monahan has participated in the sports excellence program, AFLW completion, playing for Richmond FC. SPR Abbey Gray took part in the Army AFLW completion representing SA/NT. SPR True Campbell represented in the Army's female cricket team. WO2 Ian Le Poidevin and SPR Joanna Wade represented the unit in the Army Hockey teams. LCPL Cassandra Dutton represented Victoria in ADF Ice Hockey.

This year 22 ER has farewelled SGT Geoff Smith and SGT Michael Skoblar, long standing Victorian sappers who have provided support to Army Reserve RAE for many years in combat and construction engineering.



[Sapper SITREP]

3rd Field Squadron

MAJ Patrick Trainor

3 Field attend Exercise Talisman Sabre 19

LT Melanie Fuller

With anticipation levels high, the 3rd Field team departed the rainy Adelaide morning for a hot and sunny Rockhampton on the 6th July. It was almost an even split between 3rd Field Squadron and 22ER who combined to form the Reserve Engineer Squadron to support 1CER and Battle Group Jacka throughout the Exercise. 22ER arrived the next day, and we quickly assimilated into our designated troops, which consisted of even allocations across both units. With little time to get to know each other we were given our stores and headed off into the battle. The first task was to build a dummy BDE HQ position which was used as a deception measure for the enemy. With a Squadron minus holding the ground for an equivalent BDE HQ position, there was no time left to spare with developing the position. Stage 1 pits were dug with the help of our Kiwi neighbours who brought some welcome plant assets to the task, and guns were staked in succession. As deception was key, 1 Troop spent time building

dummy weapon systems including a 50-cal, 84mm Carl Gustav and four mortars, utilising training on deception measures from lead up training at 3rd Field Squadron. Whilst these were being built, the other section was undertaking patrols around the harbour, gaining situational awareness and preventing close enemy observation.

It was a busy time manning the security of the position as 2 TP left for subsequent tasking in support of Battle Group Jacka. One of our sections were fortunate enough to be detached at this point to assist 1 CER in water purification for the BDE. This meant the section spent the majority of the exercise at Sabina Point, enjoying the beautiful Queensland weather and beaches as well as desalinating water for the BDE.

The exercise however was still continuing and soon 1 TP picked up and moved with the rest of the engineer squadron. We moved to a position behind Battle Group Jacka Headquarters. Once there, we were given a vulnerable point check on a vital route for the Battle Group Jacka combat teams. Time was spent with plentiful





rehearsals, orders and preparation. Unfortunately the Battle Group Jacka Headquarters was probed the night prior, and additional enemy actions in the battlespace meant the search mission was put on hold. After a day of waiting, the search was once again on however we had significantly shorter timings and a lessened threat status. This meant we only had time for 2 vulnerable point checks, with each section getting a turn to search. This search integrated PMVs, the infantry as security and the artillery with their ISR capabilities. It was fantastic to see the RAE Corps working together to achieve the search task.

This exercise has shown the importance of integration of units and corps and how each small task plays into a much larger strategic direction. We will build on the lessons learnt and continue to improve and foster the relationships with our 22ER and 1CER counterparts.

Mobility Support Troop assist Port Wakefield Proof & Experimental Range and Exercise Southern Skies 2019

LT Melissa Bracs

Mobility Support Troop picked up where we left off last year by deploying with trucks and plant equipment to the Proof and Experimental Establishment Port Wakefield. Upon arrival, we conducted a series of tasks in support of ongoing trials and revised engineer planning and recon, plant operation, and horizontal construction.

In March we sent operators in support of 7RAR and 1ARMD Regt on Exercise Panther Walk at

Cultana Training Area. The employment of plant on those exercises allowed rapid development of positions, including vehicle hides and targetry.

During June we addressed a critical skill shortage by conducting a water tanker operator course. The practical components of the course were carried out in parallel to ongoing construction activities, providing real experience and problem solving opportunities for the trainees and real support to the construction site. This also gave the plant operators the opportunity to practice construction of a temporary water bund for the trainees to practice drafting. We also had a couple of plant operators travel north and support 6 ESR and also qualify in the new 40M and HX77 vehicles and then help develop the Shoalwater Training Area in advance of Exercise Talisman Sabre 19.

Later we redeployed to RAAF Edinburgh to commence works in support of the Exercise Southern Sky 19 air show. Support troop was tasked with repair of existing roads and construction of new road sections to complete the bus routes to carry spectators to and from the air show, which we continued through September.

In October several plant operators deployed with a backhoe to support the annual Army Cadet exercise and conduct minor range improvements at MUTA. The troop then supported the SQN forestry weekend, assisting with the loading and transport of timber that had been felled and milled on site.



Ex Demolition Rat

LT Marika Boelen

One of the highlights of this year was Exercise Demolition Rat. Over the past few years 3 Field Squadron's Mobility Support Troop has been carrying out road, drainage and hardstand construction works for Port Wakefield Proof and Experimental Establishment. The borrow pit established to win resources for these tasks contained a one metre thick slab of cap rock made from calcrete that was unable to be ripped. This created the perfect opportunity for the CE troops to revise borehole demolitions with a quarrying focus, which is rarely practiced. Fortunately, the status of the Range certification enabled a "trial" to be conducted under the eye of P&EE staff who were more than happy to assist.

Preparation for the task began with five Tuesdays of revision training on demolitions safety, in service explosives, initiators, firing systems and improvised shape charges. The Squadron then travelled to Port Wakefield to conduct the task in the first weekend in May.

The first method of attack attempted was a top attack. This was done by attempting to create pilot holes in the cap rock using a combination of bore holing and

improvised beehives from wine bottles. 12 charges were set and detonated, however only two created significant enough damage to the cap rock to enable a larger hole to be augered, to be later filled with ANFO.

The alternative method of attack was a side attack. This was conducted in conjunction with plant. Using an auger attachment on the backhoe, a two meter hole was created on an angle under with the cap rock.

The two top attack and four of the side attack holes were then filled with 25kg of ANFO each, backfilled and tamped, and dual horizontal and vertical ring mains were run in order to practice the principals of reserve demolitions.

The six charges were detonated to great success followed by the preparation and detonation of the final six charges, winning a large amount of material and allowing Plant Troop to continue construction at P&EE.

Ex Demolition Rat had the benefit of achieving both training value and completing a task required by Plant Troop. It was a rare occasion where our CE and Plant troops were integrated and working side by side to complete a task and did so with great success.

[Sapper SITREP]

13 Field Squadron

MAJ Daniel Kennedy-Stiff

2019 has seen 13th Field Squadron subject to a frantic and high paced year of training. This training has been guided and shaped all year resolute in the knowledge that the squadron is required to provide a troop of engineers to Hamel 2020. As a squadron organic to a greater infantry battlegroup the majority of the training conducted has been thoroughly integrated, which has afforded the sappers the chance to significantly develop their ability to operate in a combined arms environment. The first two weekends of the year focused on upgrading the Squadron's watermanship qualifications, this culminated in a rather charming day of boating upon the Swan River. Concurrently a section of engineers and a troop headquarters element, were attached to a combat team conducting a large clearance operation at Collie. This exercise tested the sappers' ability to participate in offensive operations and partake in demanding pack marches.

May saw the Brigade's 9 day exercise take place at the Bindoon Training Area. During the weekdays a small but highly dedicated team led by SGT Gallen constructed an obstacle belt consisting of dragons teeth, an anti-tank ditch and multiple layers of concertina wire at the plant training area. This obstacle belt was constructed and subsequently reduced in perfect replica upon the demolitions range, which allowed the more junior members of the Squadron to witness firsthand the effectiveness of different types of explosives upon various obstacles. The culminating activity

for the exercise was a combined arms in stride breach of the aforementioned obstacle belt. This breach was not only marvellously enjoyable, but it furthermore allowed all of the other units of 13th Brigade to witness firsthand the capability of an RAE led exercise. The Brigade's public relations officers would rely on the splendid photographs taken by LCpl Turner on the day, for months to come.

The middle of the year saw the Squadron conducting a refresh of its basic sapper skills, additionally it witnessed the commencement of the construction of a non-equipment bridge at Irwin barracks. Come August with the demands to be made upon the Brigade next year, in ever the forefront of planner's minds, 13th Brigade conducted a fully integrated combat team exercise at Swanbourne Training Area. This saw the sappers with great zeal refresh their VCP and search skills, in what proved to be a rapidly changing environment.

The year also saw numerous squadron members participate in Exercise Puk Puk and Operation Augury, special note must be made to Sapper Malcolm Stewart who participated in his fifteenth AACAP. The frantic and at times fluid year of training has placed 13th Field Squadron in a position of great strength in order to allow it to fulfil its 2020 Hamel support requirements. Tremendous plaudits must be awarded to the cadre staff of CAPT Sanders, WO2 Wilson, SGT Hall and SGT Dickson, whose ceaseless work has ensured the effective functioning of the Squadron.



[Sapper SITREP]

Special Operations Engineer Regiment

From the Commanding Officer

In 2019, the Special Operations Engineer Regiment has focused on modernising the ADF C-GBRNE capability through achieving Full Operational Capability of Project Land 3025 Phase 1. It has also continued support overseas operations and Domestic Counter-Terrorism (DCT) Lines of Operation (LoO) and has undergone a restructure to better balance operations support and modernisation.

The Regiment provided Operators and plans staff to the SOCOMD contribution to Exercise Talisman Sabre 2019. The exercise saw the establishment of a US and Australian Combined Joint Force Special Operations Command Centre (CJFSOCC) to support the Combined Joint Task Force (CJTF) 667. The CJFSOCC comprised of two Combined Joint Special Operations Task Force (CJSOTF); one being a land component (CJSOTF 64X) and the other predominantly an air component (CJSOTF Centurion). Members from A Sqn SOER contributed to CJSOTF 64X identification of the threat network through the provision of an exploitation capability. The SOER operators also provided specialist C-GBRNE support to CJSOTF 64X to enable the recovery of CBRNE materials. The CBRNE threat was isolated to

the SOCOMD situation and presented to wider Army as “lethal aid”. This support allowed the CJFSOCC to enable CJTF 667 by targeting a threat network in the deep fight and countering the proliferation of lethal aid.

Alpha Squadron

Throughout 2019, Alpha Squadron has provided support to SOCOMD Force Elements across domestic and global lines of operation. Sappers have been employed through enduring operational commitments in the Middle East as well as maintaining readiness to respond to domestic and global contingencies. Sappers have conducted force generation activities focussing on specialist C-GBRNE, insertion and integration skills. This year has included a significant number of international engagement activities as the Squadron continues to benchmark standards against similar international organisations and maintain engagement with our regional partners. Ongoing development activities have seen Sappers up-skilling and employing emerging technologies, further broadening response options and survivability against current and novel threats.



SOE Operator employs dual detection equipment on exercise.

Bravo Squadron

Bravo Squadron continued to support multiple lines of effort throughout 2019. The provision of integral support to Major Combat Units of Special Operations Command, the force generation and deployment of specialist elements in overseas theatres, and ongoing development of unique capabilities were all undertaken.

Bravo Squadron conducted multiple international engagement activities in 2019, building relationships with key international stakeholders. Developing and maintaining linkages with international C-CBRNe elements ensures that the Special Operations Engineer Regiment maintains leading-edge tactics, techniques and procedures. The conduct of these events directly contributed to the ongoing development of capability on behalf of Special Operations Command.

Bravo Squadron continued to build important relationships with key ADF and domestic policing agencies, conducting a number of activities which facilitated the transfer of skills between ADF and State and Federal bomb response groups. These exchanges were mutually beneficial, and contributed to ensuring SOER is connected with relevant ADF EOD and domestic emergency response agencies.

A year in the life of a Reinforcement Training Cycle Sapper

A Combat Engineers' pathway to SOCOMD

CPL K

To be a Special Operations Engineer (SO ENGR) has been a career goal for me since I enlisted in 2009. To be finally training towards that is a humbling experience. In the Regular Army, I have been deployed to Afghanistan on two occasions, and have also been a part of numerous Domestic Search Operations. The ARA presented me with many physical and mental challenges, which have assisted in preparing me for SOCOMD.

The Reinforcement Training Cycle (RTC) is a long process from start to finish. It all started from submitting my application through to Special Operations Training and Education Centre. The next stage was the Special Forces Support Staff Diagnostic Assessment (SFSSDA), which tested my physical and mental fitness, as well as RAE foundation knowledge to ascertain if I was suitable to be a SO ENGR. Later that year, I was notified that I had been accepted for the RTC.

In January 2019 I commenced the RTC at SOTEC. The first suite of courses are designed to enable you to work within SOER in general. These courses include SF weapons training, Chemical, Biological, Radiological (CBR) fundamentals and the CBR Operator courses.

The second suite of courses is aimed at preparing you to operate with other force elements within SOCOMD. One of these courses is the Tactical Integration Course, the main tactical course of the RTC. It focuses on rural tactics, urban movement, room floor combat and the Army combative program.

The course culminates with a night live fire exercise, focusing on room floor combat and urban tactics. The next set of courses that are also necessary are the Insertion skills component. That includes rappelling, climbing, and fast roping; but also contains extraction skills like suspended rope and caving ladder extraction. The highlight of this component was the ability to conduct these skills in a live helicopter later in the RTC.

The third and most important suite of courses is the SOER Baseline Operator Package. It contains all the core skills and knowledge for your employment as a SO ENGR. Some of these skills are decontamination, technical high risk search, and site exploitation, as well as SO Engineer and CBRN specific equipment. The training package is designed to expand the operator's subject matter knowledge and confidence dealing with an array of possible threats, culminating in a series of practical assessment scenarios.

The SO ENGR RTC has trained me to a baseline standard for me to work within SOCOMD and provide that intimate support to those forward elements and enable the mission however, the training is only just beginning. One of the highlights of the RTC for me was being a part of SO ENGR attachment enabling a Commando Platoon for a training exercise. The RTC had prepared me to assist their planning and advising potential threats within my specialisation, which has given me valuable experience moving into that Line of Operation in the future.

SOER provides a niche capability to the ADF, and Australia as a whole, and has opportunities to train with international partners to showcase our abilities and learn new techniques. The easiest step in becoming a SO ENGR operator was putting in my application, and the hardest is to prove that I have the values and attributes required of an SO ENGR in order to meet the standards set by SOER, SOCOMD and Army.

Modernisation – Project Land 3025

What is Land 3025?

Project Land 3025 (L3025) is a CASG led project that will deliver a deployable Special Operations Engineer capability focused on C-CBRNE to enable SOCOMD to achieve mission success in support of national interests. This project comprises of investment into the people, equipment and infrastructure of SOER.

When will the project be delivered?

The project is delivered in two phases the first of which is already being delivered to achieve modern foundation levels of capability. The Regiment will continue to focus on phase one capability realisation

and future planning in preparation for delivery of the subsequent phase to achieve an enhanced capability.

What will L3025 achieve?

The project aims to keep SOER at the forefront of the C-CBRNE environment and postured to respond to emerging threats. An important delineation, however, must be made between the delivery of tangible products and capability. While the project does focus on modernising the equipment employed by operators it does so with the equipment procured being directly linked to enhancing capability. Furthermore, this project enhances SOERs ability to conduct its core functions being enable, find, analyse, neutralise, exploit and restore.



In addition to procuring contemporary equipment, the project will deliver facilities improvements to the SOER compound and wider areas. An expansion of the existing Troop areas will accommodate the storage of additional equipment as well as provide purpose designed training areas to facilitate local training. L3025 also includes funding to enable training with international partners where domestic training areas cannot adequately replicate the desired environment.

Notably, the project sets the conditions for SOER to transition from a supporting to a supported unit where it is able to lead mission profiles in support of national interests. Changes to Part IIIAAA of the Defence Aid to Civil Community policy framework further enable

the Regiments ability to provide specialist capabilities in support of domestic security operations.

How will Land 3025 enable RAE?

The benefits of the project will not only be experienced by SOER but rather RAE as a whole. The training and expertise obtained by operators at the Regiment will be transferred to RAE through peer to peer engagement on Corps specific courses and instructor to student engagement at training establishments.

L3025-1 has introduced-into-service a number of CBRNE equipment types that are now being introduced into the wider Corps, such as the TITAN EOD Disruptor, VMR3G Hand Held Detector and the DCT-X initiation device, as well as providing TTP exchange for other systems such as the Polimaster radiation detector and the Force 1 Team Decon system.

The project provides an opportunity for SOER to operationally test and evaluate emerging technologies to inform partner projects such as L2110 – delivering CBRND capability to the wider RAE. The technologies delivered by the project have also enabled SOER to provide support to 20 EOD through both operational and EOD training activities.

What's next for SOER?

As L3025 is currently in Phase 1, the Regiment will focus its attention on the achievement of Full Operational Capability and delivery of the subsequent two phases from 2022 onward. The restructure of SOER has prepared the Regiment to implement changes to its force elements and incorporate the new equipment into current and future operations.

Career Opportunities

The Special Operations Training and Education Centre (SOTEC) screens candidates for service within SOCOMD as Special Forces Support Staff in the first quarter of each year. The screening is designed to identify candidates across all ranks with an intellectual aptitude, CBRND competency and the capacity to conduct technical led operations within a SOER team. A candidate's suitability against these attributes is reinforced with performance in the Special Forces Entry Test. Although SOER relies heavily on support staff from Corps external to RAE, however candidates to become Special Operations Engineers are drawn from within the Corps. Further information on application, screenings and contacts can be found on the SOTEC Sharepoint page accessible through the Defence Protected Network via the following website <http://drnet.defence.gov.au/army/>



SOE Operators mitigate spread of contaminant.

[A paper]

Combat Engineer Regiments in 2030 – The use of unmanned vehicles to improve force protection for css personnel in the land battle

CAPT Matthew Mandl

“The soldier above all others prays for peace, for it is the soldier who must suffer and bear the deepest wounds and scars of war.” – MacArthur, D.

Introduction

The ADF has been exceptionally lucky, when compared to coalition partners, to have had relatively few operational casualties in the modern era. However the avoidable death of even one soldier should be viewed as unacceptable and mitigated wherever possible, and as such the ADF plans to spend billions in the transitional phase to 2035¹ on improved capabilities and force protection measures. Concurrently the vision of the Defence Logistics Enterprise Strategy 2016-2021, ensures that technological enhancements will increase Australia’s capacity for both combat and non-combat operations². Both documents focus not only on the improvement to capability and operational readiness within Defence, but on Force Protection and the survivability of deployed personnel. Combat Service Support (CSS) personnel in Combat Engineer Regiments (CER), and other Combat units, are increasingly placed closer to the Land Battle and are required more frequently to operate close by their supported Unit. Specifically for CER CSS personnel deployments, alongside Engineers, are in theatres where at the tactical level threats are largely asymmetrical and casualties occur from unexpected attacks or deliberate actions where expected casualties are high; Breaching and Route Clearance operations³. In order to mitigate loss of life and serious injury, Defence must continue to improve its own Force Protection technology, systems and procedures to stay ahead of constantly advancing near peer adversaries. In armed conflict the most effective force protection measure is to remove personnel from dangerous environments completely.

The aim of this paper is to demonstrate how the implementation and use of unmanned protected land vehicles will reduce operational casualties and improve the operational effectiveness of current in-service vehicles in threat environments. This paper will specifically consider CSS personnel in direct support of combat operations and the scope of this paper will focus on the causes of casualties in recent operations, opportunities for the use of unmanned land vehicles, their potential use and integration into Defence service.

Causes of Casualties

Current and future conflict will likely to continue to be centred on urban, or semi-urban terrain, against military or para-military based adversaries striving for ideological and political outcomes. Their weaponry and technology will constantly improve and near-peer adversaries will have increased lethality on the battlefield. Recent examples for Coalition nations include the Iraq and Afghanistan conflicts throughout the 2000s. By examining roughly 500 casualties during the period 2006-2007, 85% of fatalities were Battle Casualties. Of these Battle Casualties, 53% in Iraq and 13% in Afghanistan were a result of Improvised Explosive Devices (IEDs) and small arms fire accounted for a very similar 12% and 13% of hostile fatalities in the respective conflict zones. In 2030, Australian Combat Engineers in armed conflict should continue to expect attacks via placed explosive devices, including IEDs and mines, and direct fire weapons, however technological advances will improve the lethality of these weapon systems.

1 Department of Defence 2016, Defence White Paper, Canberra

2 Department of Defence 2016, Defence Logistics Enterprise Strategy, Canberra

3 LWP-G 3-6-8 Combined Arms Obstacle Breaching

As S. Bird states with her data above, the overwhelming cause of casualties in modern conflicts, 12% – 53%, are a result of explosive devices and small arms fire. The use of these types of attacks improves annually, especially in Afghanistan after 2006 when the Taliban started to string antitank mines together in a ‘daisy chain’ or returned to more primitive, non-electric IED methods in their attempts to bypass or circumvent US and NATO countermeasures. The threat to Engineers, who frequently operate around these threats, will continue so long as personnel are required. By dislocating soldiers from these threats, whilst still achieving the mission, the risk of casualties is removed. A remotely controlled unmanned vehicle attacked whilst conducting a resupply task might be lost or destroyed, however the human loss is negated, preserving life and combat power.

Opportunities for the Use of Unmanned Vehicles

With automation increasing in all industries to improve efficiencies and workplace safety, the opportunity for Defence is to automate aspects of its Force Preservation by removing all soldiers, not just Engineers, from the battlespace wherever possible through the use of unmanned vehicles. Under the Defence White Paper the Australian Defence Force (ADF) is currently exploring unmanned systems as part of the Tiger Armed Reconnaissance helicopter replacement in the mid-2020s. The introduction of unmanned ISR support aircraft would be used to provide tactical commanders with greater access to real-time information and close, independent surveillance of the battlespace. At the same time the ADF is currently seeking to acquire Armoured Breacher Vehicles (ABV), also based on the M1 Tank, under Project LAND 8160. These ABVs can be configured for manned or unmanned use and will dramatically improve survivability on the battlespace. These assets also provide opportunities to expand this vision to Combat Support (CS) and CSS operations.

In 2008 and 2011 the US Defence force has considered and procured technologies focused on convoy and site security. MAJ Damien Green, U.S. Army, considered convoy security with UGVs (autonomous vehicles) necessary for the military because of the rapidly changing, unstable, and unexpected combat theatre. In his study, MAJ Green also mentioned that in order to continue conducting operations in a dangerous and foggy environment, gaining an autonomous capability is crucial. He highlighted that although fully autonomous vehicles are possibly farther off into the future, an important step would be to have at least some part of a convoy composed of UGVs that follow a manned leader vehicle. It is particularly important to keep soldiers away from danger and keep conducting military actions without reducing the tempo. MAJ Green also asserted that an autonomous convoy capability might be an effective force multiplier and might increase the commander’s operational initiative and flexibility. In addition, an autonomous convoy might advance in the field at a higher speed and with a closer formation, ensuring rapid movement of the convoy. For a manned convoy, moving closer together increases the risk of casualty from an improvised explosive device (IED) attack. But for the unmanned convoy, that might be an affordable risk when a commander considers speed over security concerns. In the US Army, the Project Office for Maneuver Robotics and Autonomous Systems (TPO-MRAS) is prototyping and testing the next generation of Robotic Combat Vehicles (RCV), a 25-ton unmanned replacement for the 80-ton Abrams Tank that will deliver the same lethality to the battlespace, without a crew. The RCV project aims to have units built in 2021, highlighting the importance the US Army is placing on unmanned combat vehicles.

Potential Use of Unmanned Vehicles

To offer increased protection to personnel, all armour and protected vehicles have been based on the three key capabilities of firepower, mobility and protection. Army’s current capability of protected vehicles used by CSS personnel; Bushmaster Protected Mobility Vehicle (PMV), Australian Light Armoured Vehicle (ASLAV) and M113 Armoured Personnel Carrier, are designed to deliver soldiers into the battle, offer a degree of protection from enemy and enable them to operate under varying conditions and threats. The key restriction with these vehicles is that soldiers are required to operate them, when in certain situations an unmanned vehicle could be used without the risk of troops inside.

The Bushmaster provides occupants with a high level of ballistic protection; protection from up to 7.62mm at 30m, up to 8kg explosive blast under and around the vehicle not including mobility kills, 155mm high explosive artillery at 25m and Fragment-Simulating Projectiles (FSP) including M791 Armor-Piercing Discarding Sabot rounds at 500m.

The ASLAV provides occupants with an increased level of ballistic protection in a faster, more agile vehicle. The all-welded steel hull protects the crew from small arm fires and shell splinters. The add-on armour fitted on the vehicle provides all-round protection against projectiles of up to 14.5mm, frontal arc protection from 30mm projectiles, and overall survivability has been successfully increased through the use of external ballistic caging.

The M113 Armoured Personnel Carrier, a tried and tested workhorse of Australian military history, incorporates armour resistant to small arms fire, ballistic plating for mine blast protection and spall curtains to maximise passenger survivability.

The key component and inherent risk for a potential fatality common to these vehicles is their requirement for a crew. Even with enhanced armour, clever design and protection measures casualties still occur. The opportunity is for these vehicles to be converted to unmanned systems enabling tactical support without risking operators. At the highest level of the warfare spectrum soldiers on the ground are ultimately required to Secure, Capture, Clear or Deny. However, the argument that personnel are required for all tasks in warfare is becoming increasingly redundant and unmanned vehicles could certainly be used to support combat troops. This would remove non-essential personnel from the battlespace and reduce casualties. In a contemporary setting, battlespaces the ADF is currently familiar with include Helmand Province, Afghanistan, Baghdad, Iraq, Dili, East Timor or even Sydney, Australia; the Lindt Café siege as a fringe example. All of these battlespaces are ideal for the current fleet of ADF protective vehicles. In Iraq and Afghanistan the deployed fleet had excellent mobility and used systems common to our coalition partners. The opportunity for Defence is to remove forces from these areas, whilst not degrading our combat effectiveness or capability, through the use of remotely controlled, unmanned vehicles. At either end of the task spectrum unmanned vehicles could be utilised in supporting personnel after the point of contact with the enemy, such as troops under fire, and logistical or administrative movements around a battlespace, such as familiar administrative moves along a Main Supply Route (MSR). Dependant on how the current fleet is configured all variants could be used in both combat and non-combat roles; also dependant on threat, terrain and task.

The scenario whereby unmanned vehicles could be used to best effect for CSS tasks include resupply and evacuation of casualties, or for Combat tasks such as withdrawal and close surveillance in support of ground troops. The reconfiguration of current in-service vehicles to a driverless platform would enable these tasks to be undertaken without the need for purchasing a new or separate fleet. Potential modifications to in-service vehicles, similar to the US Army Gladiator, a golf cart sized unmanned vehicle, could include cameras, directional and communication tools, and potentially remotely fired armaments. These modified, unmanned vehicles could now be laden with supplies and able to be driven under fire directly, or very close, to the positions of troops in contact enabling quick resupply and/or evacuation of casualties to medical support. The new worst case scenario, outside of those personnel already in contact, would be loss of vehicles and equipment, rather than loss of additional personnel; human fatalities. Unmanned vehicles used in these roles negates the need for additional troops to enter the battlespace, reducing casualty risk. Destruction and mobility kills of unmanned vehicles carry the same risks as manned vehicles. Whether carrying stores or troops, destruction would usually mean the complete loss of the vehicle and its load. A mobility kill would mean the isolation of, and requirement to secure or defend that vehicle until recovery can be affected. In both manned and unmanned cases stores and equipment would be involved, however the drivers and crews have been removed from risk. The argument therefore is to determine if the reliability of unmanned vehicles outweighs the risk of additional personnel being brought within the danger zone at all. Depending on the task and the level of threat, unmanned vehicles would outweigh this risk and should be implemented for use as soon as possible.

The most dangerous task for Combat Engineers, and the elements that support them, is an Obstacle Breach, with an expected casualty rate of approximately 60%. Whilst it would be impossible to remove all human participation in this task, is there a need for every vehicle or breaching asset to be manned? In this example unmanned vehicles could be supported by manned vehicles, which would provide an on-the-ground human element for C2 and contingency actions. Manned elements with the ability to command unmanned vehicles, during the breach or in-contact resupply, would provide a balance between remote and close control by

dislocating (not necessarily replacing) the soldier further from the threat . By removing personnel from the battlespace wherever possible, the ADF retains the ability to operate and the enemy can only target assets rather than soldiers.

CSS Scenario

In a practical RAE example, unmanned Logistics vehicles could be used to support battlefield clearance and refit-to-fight after a Mechanised Breach. The supported force has completed a breach of enemy obstacles, pushed forward to deny enemy interference around the obstacle and is postured to resume the advance. With potential indirect threats remaining the Commander orders unmanned vehicles to be used to resupply the Force and extract casualties. In this scenario, Logistic Planners determine the critical stores and casualty liability to be moved forward and rearward. A2 echelon personnel transport stores forward to a pre-designated 'safe line', whereby Materiel Handling Equipment (MHE) is used to transfer stores from L121 vehicles onto unmanned platforms. The unmanned platforms are then direct controlled, or pre-programmed, to organised resupply locations in very close proximity to friendly force positions. Here stores are transferred to the dependency and casualties loaded onto the unmanned platforms, returning to the 'safe line'. In this action, troops already in contact remain in contact, however additional troops stay behind the 'safe line' reducing the risk of additional casualties to zero. The principles for the use of unmanned platforms, in a task such as this, are no different to the use of manned platforms. Commanders and planners are required to properly identify the dependency need and carry out adequate planning to ensure risks are mitigated and the task is executed effectively.

Integration of Unmanned Vehicles into Defence

To satisfy the requirements of the above mentioned tasks and roles, future variants of in-service vehicles would need to be configured to retain protection, mobility and varied utility. The ADF has long sought platforms which can be utilised in a variety of tasks, across multiple environments; a philosophy which saves Defence the need for multiple platforms, extensive logistics chains to support them and less training for a simpler fleet network. Extensive researched by the US Army has been completed with a similar aim, to have unmanned vehicles relatively indistinguishable from the manned vehicles in both appearance and behaviour, capable of occupying any position in the convoy order including leader, and able to traverse the same terrain and operate in the same environmental conditions. Unmanned vehicles are still susceptible to enemy interference and lack the intuitive decision making a human driver can affect across complex terrain in rapidly changing situations. Immediate threats to unmanned vehicles include communication jamming to radio frequency controls, reduced visibility due to damage to sensors, and decision-lag inherent in dislocated control. Technological solutions to jamming have already been proven on the battlefield with the use of signal bubbles and pre-programmed 'actions on' in the event of communications loss, similar to off-the-shelf drones. Depth in control mechanisms would reduce failure or ineffectiveness in the control of unmanned vehicles. Overlaid remote, line-of-sight and pre-programmed route controls would allow for a cooperative controlled and autonomous management of the vehicle. For example when GPS is not available computer vision target tracking, RF control and even acoustic based tracking have been demonstrated to a high level of accuracy. The implementation of unmanned vehicles should also complement current operating procedures rather than impose a doctrinal change and re-training burden on current forces. By seamlessly entering service use the intent for unmanned vehicles is to be a combat multiplier for use now.

In the logistical or administrative movement scenario the principles of defence are maintained with emphasis on security, flexibility and survivability. Unmanned vehicles moving in convoy, transporting stores or personnel, would be supported by manned security vehicles. The security vehicles would have the additional task of acting as controllers for the unmanned vehicles. Control of unmanned vehicles in this scenario could be achieved in a number of ways already available in commercial systems; line of sight radio control, pre-programmed 'follow me' tracking control and/or pre-programmed route selection. The first two methods require more intensive operator control but also allow more flexibility and quick-decision making. The last option requires thorough route reconnaissance and a less complex terrain allowing easier identification of the route and less obstacles to negotiate. As technology advances more intuitive systems will allow for use in the increasingly difficult terrain. These systems have the ability to remove controls from

operators, replaced by hand signals and target recognition processes. The use of unmanned vehicles in a line-of-sight remote or 'follow me' control situation would be ideal in a logistical resupply convoy situation in a medium to high threat environment. For example a convoy of six unmanned resupply vehicles, provided security by two manned escort vehicles, reduces the personnel in the battlespace from 18 (drivers, co-drivers and gunners), to 12 (3 man crew in protection vehicles and a controller for each unmanned vehicle seated in the security vehicles). A 'follow me' controlled convoy would reduce the personnel required to the six crew in the protection vehicles only. In either scenario personnel inside the battlespace has reduced by 1/3 or 2/3.

In a combat scenario, single unmanned vehicles could be driven right up to the positions of Forward Line of Own Troops (FLOT), where troops in contact could collect additional ammunition and stores as well as load casualties for immediate withdrawal to medical facilities. The flexibility of keeping troops in the fight rather than having up to four personnel withdraw with a stretcher borne casualty maintains combat power at critical moments. The unmanned vehicle removes drivers from risk and, provided that mobility enablers are protected, can be manoeuvred into locations under fire without the risk of loss of life to those not originally in contact. In extreme cases an armoured, unmanned vehicle could be used as a moving shield to allow troops to reposition to cover across open terrain whilst under fire. A perfect example of this, saw Trooper Mark Donaldson VC use this same method to withdraw from contact under whilst using a manned vehicle as cover. US Army unmanned systems such as the Scout, based on a Polaris 4x4 ATV, allow an operator to manoeuvre the vehicle into harm's way and conduct surveillance whilst the human element remains out of the battle.

Conclusion

The continual shaping of contemporary modern warfare from attritional battles to widely dispersed, generally urbanised conflict zones against state and non-state forces will see Engineers rely heavily on personnel and technological force protection measures. By removing soldiers from the battlespace wherever possible minimises the possibility of casualties in theatre and is the greatest force protection measure available. Whilst there is much more exploration and planning required for the implementation of unmanned land vehicles in the ADF, the current fleet provides an already known resource which could be adapted to provide an unmanned capability with the least disruption to procedures or training. The implementation and use of these vehicles will reduce operational casualties and improve the operational effectiveness of current in-service vehicles in threat environments by removing unnecessary personnel from danger. There are obvious challenges to how unmanned vehicles could be used effectively on operations, however the benefits unmanned vehicles will bring to commanders and troops on the ground are limited only by the initiative of their operators. Their use will allow the ADF to support operations or exploit dangerous opportunities without risking additional forces in the process. The implementation of unmanned vehicles within the ADF should be considered an operational necessity and implemented for operational use sooner rather than later.

Bibliography

- ADI, 2006. Bushmaster. s.l.:s.n.
- Army, A., n.d. M113AS4 Armoured Personnel Carrier. [Online]
Available at: <https://www.army.gov.au/our-work/equipment-and-clothing/vehicles/m113as4-armoured-personnel-carrier>
- Army-Technology.com, n.d. ASLAV-25 Light Armoured Vehicle. [Online]
Available at: <https://www.army-technology.com/projects/australianlightarmou/>
- Australian Army, 2008. Land Warfare Doctrine, LWD 3-3-7, Employment of Infantry. s.l.:s.n.
- Australian Army, 2009. Land Warfare Doctrine, LWD 4-3, Transport Support. s.l.:s.n.
- Australian Army, 2016. Land Warfare Doctrine, LWD 3-3-4, Employment of Armour. s.l.:s.n.
- Carroll, D., 2004. Unmanned Ground Vehicles for Integrated Force Protection. s.l.:USAF Force Protection Battlelab.
- Cox, M., 2018. Army to test the first Robotic Combat Vehicle by 2021. Military.com.
- Defence, D. o., 2016. 2016 Defence White Paper. s.l.:s.n.

- Defense, U., 2010. BAE Systems M113 Vehicles History. [Online] Available at: http://www.uniteddefense.com/www.m113.com/m113_history.html
- Donaldson VC, M., 2013. The Crossroad. s.l.:s.n.
- Johnson, T., 2007. Taliban Adaptations and Innovations.. Small Wars and Insurgencies Vol. 24 ed. s.l.:s.n.
- Joint Logistics Command, V. C. o. t. D. F., 2016. Defence Logistics Enterprise Strategy. s.l.:s.n.
- Mao, W., 2017. Indoor Follow Me Drone. s.l.:University of Texas.
- Matsumara, J., 2017. Assessing Tracked and Wheeled Vehicles for Australian Mounted Close Combat Operations. s.l.:RAND Corporation.
- Nardi, M. G., 2008. Autonomy, Unmanned Ground Vehicles, and the US Army: Preparing for the future by examining the past. s.l.:School of Advanced Military Studies Fort Leavenworth.
- Naseer, T., 2013. Follow Me: Person Following and Gesture Recognition with a Quadrocopter. s.l.:University of Frieburg - Germany.
- Sarson, P., 1993. M1 Abrams Main Battle Tank 1982–1992. New Vanguard (Book 2).. s.l.:Osprey Publishing.
- Sheila, M., 2007. Military Fatality Rates (by cause) in Afghanistan and Iraq: A Measure of Hostilities. s.l.:Oxford Academic.
- Zych, N., 2013. Achieving integrated convoys: Cargo Unmanned Ground Vehicles development and experimentation. s.l.:Oshkosh Corporation – USA.

The construct of the Combat Engineer Regiment in 2030

CAPT William Harper

In capability and development terms, 2025 is today, and we will be fighting with today's Australian Defence Force and our interagency partners – chief of Defence Force, 2019

Introduction

This discussion paper is designed to trigger debate on the future of the Combat Engineer Regiment's (CER) structure, manning and capabilities in 2030. It will argue that the current structure, manning and capabilities of the CERs are not suitable for the provision of Combat Engineering (CE) support to the Combat Brigade (CB). It will propose that the CER needs to redefine the capabilities required to support the CB in mobility, counter-mobility and survivability, whilst divulging itself of sustainability support. In providing this support, the CER must identify what critical tasks it needs to be experts in to enable the CB to 'fight, move and fight at the forward edge of the battle area'.

The CDF's assessment of modernisation for ADF in 2025 in the quote above alludes to the fact that we will need to work within the already agreed capability being delivered over the next ten years being employed in any future conflict. The proposed structure within this paper acknowledges current manning constraints and a set Integrated Investment Program (IIP) for future investment until 2030. Seeing the bulk of the equipment to be delivered in FY 25-26.2 Most importantly, this paper does not propose to reduce the capability of the Royal Australian Engineers (RAE), only to revise where within Army the capability exists. Nor is there a suggested increase in manning the RAE, the intent of the proposed restructure is to deliver a CER that meets the immediate needs of their formation and operating environment within the constraints of the 2030 timeline. The proposed structure recognises the value of seeking support from the Enabling Brigade, reinforcing the CER with additional survivability and sustainability support capabilities as required. The Corps needs to make tough decisions in the near term on future unit structures, as it cannot wait until the delivery of new capabilities. There are other corps within Army ready and willing to bolster their own ranks if we fail to evolve.

The Future Operating Environment

To develop a future CER construct, the operating environment that the organisation will be employed in needs to be defined. It has been well documented that the future operating environment will be crowded, connected, lethal, collective and constrained. The proliferation of advanced lethal conventional and non-conventional weapons used by both state and non-state actors will result in an increasingly

non-linear battlespace. Advancements in connectivity and the much-discussed increased use of remote / autonomous platforms will result in a greater signature, even for the most basic force elements. Combined with the advancements in long range fires and advanced targeting methods across all domains, forces will need to remain dispersed to survive, with the ability to centralise for the conduct of deliberate actions against the enemy.

To avoid targeting, forces will need to remain under the integrated air and missile defence umbrella. Presenting a low signature until the force can consolidate at a place and time of our choosing for a fleeting opportunity to defeat the enemy. To enhance survivability and exploit this opportunity, the basic building block of capability the Combat Team (CT) will need to be more lethal, balanced and network enabled. In this future, superior mobility (MOB) may compensate for numerical inferiority, terrain, weather and enemy effects. Engineers in this environment will be critical in maintaining immediate MOB support to the force, with the ability to rapidly transition to counter-mobility (C-MOB) or survivability (SURV) support. As an example; with the proliferation of conventional and non-conventional explosive devices will result in the requirement of immediate clearance to avoid subsequent targeting by direct, indirect and electronic attack assets. Operational environments like Afghanistan, where tempo could be dictated will become fewer and forces remaining immobile will be easily detected, targeted and unlikely to survive.

Current Employment of the Combat Engineer Regiment

As evident by Exercise Talisman Sabre 2019, (along with the majority of recent combined arms exercises) the activity was devoid any near peer enemy engineer effect for Combat Engineers (CE) to be employed in their primary roles. The traditional enemy engineer effect has been reduced to a limited plant works (both C-MOB and SURV), wire and victim operated improvised explosive device threat. The recent employment of Engineers in the CT, outside of Engineer specific tasks (like bridging), is an engineer troop attached to a CT for the exercise duration. Usually being only employed to conduct search and undertake section level breaching under unacceptable risk for a dismounted force.

These training outcomes do not align with the significant contribution that Engineers have made in conventional conflicts, current and past. For the most part, this is a result of a lack of resources and time, environmental constraints and most importantly, the lack of suitable platforms to support the CB in current and future operating environments. The current employment of CE has resulted in those outside of the Corps having a misconception on the correct employment of CE and the associated requirements to enable CE to work in a conventional threat environment. Many outside the Corps only reflect on their own experiences, on recent operations, in theatres such as the Middle East; this has led to a poor understanding of the employment of Engineers in a conventional threat environment. One example of these requirements that has deteriorated within the Corps and poorly understood in wider Army is engineer reconnaissance and intelligence. Without incorporating conventional enemy engineer capabilities in the exercise environment, there will be obvious impacts on the planning and execution of engineer tasks. The Corps is responsible for this shortfall in exercise design and needs to reinvigorate these deteriorating skills to enable realistic planning and execution of tasks prior to the roll-out of future capabilities.

Incoming capability

The CER's equipment and platforms by 2025 will be significantly different to what units currently hold. These changes will have a direct effect on how the unit will need to be structured and operated. The upgrading and introduction of new capability will allow the CER to employ specialist engineering capabilities internal to each of the CB. More importantly, it will finally allow the CB to operate in a conventional threat environment against a near peer threat. Below is a synopsis of each of the major projects due for delivery prior to 2030 and some considerations of the impacts on their introduction into service.

- LAND 8160 Phase 1 Under Armour Breaching and Bridging.** The delivery of this capability will allow the CB to breach or bridge an opposed complex obstacle. This will be well beyond earlier capabilities held by Army, such as the Special Equipment Troop within the Armoured Regiment of old. Although the primary task for these new platforms is MOB support, they will be capable of providing a CMOB support effect that will be required to fill the gap from the absence of armoured plant from LAND 8120. As this new capability is introduced, the CE manning requirements will need to be developed to enable the successful breaching of complex obstacles. Including; obstacle reconnaissance, breach/support/assault force MOB support and ongoing lane maintenance requirements. The CE availability to complete these tasks will need to be carefully managed by Engineer Commanders, against the concurrent engineer support requirements of the CER across the entire battlespace. As such, there will need to be further analysis on the number of mounted and dismounted CE to create multiple lanes in a complex obstacle in support of the CB's manoeuvre.

- **LAND 2110 Phase 3 CBRND.** Although proposed as an all-corps responsibility, there will be an ongoing requirement for RAE to play a leading role to enable the successful roll-out of LAND 2110 and its ongoing employment. This project delivers individual - collective protection and decontamination capability, revitalising a deteriorating capability. Allowing Army and wider ADF of 2030 to operate in a contaminated and contested environment. The ADF must be able to initially survive surprise, with the end-state being able to achieve survive to manoeuvre. This step forward in capability and will come with a significant ongoing training liability and like most specialist capabilities in Army, it is essential that a centres-of-excellence are maintained. The successful roll-out of this project will be extremely important given the catastrophic outcomes should Army fail to employ the capability operationally. Although it is intended that individual components of this project are distributed throughout the CB, the CER will be critical to maintaining a future deployable capability. As such, the proposed new CER construct has considered operating in a contaminated environment, allowing immediate access to CEs for CBRND advice on decontamination, decontamination and undertaking survey from the screen to the rear guard.
- **JP154 Phase 3B Counter Joint Improvised Explosive Device.** This project is due to reach IOC by FY 22-23. With the continued refreshment of current Force Protection Electronic Counter Measures (FPECM), Counter Improvised Explosive Device (CIED) and replace existing Explosive Ordnance Disposal (EOD) robots and to further develop the ADF's route clearance capability. Just as this emerging threat has influenced the design of new vehicles, leading to the increased survivability of mounted personnel. This project will certainly influence the methods in which the CER operates, is structured and how the Corps provides support to the CB. Explosive hazards have always been the remit of Engineers and this will not change in a future operating environment as the non-linear battle space continues to distribute the treat across all components of the force. The ability for Engineers to rapidly respond to an explosive hazard being identified and responding across the entire force in a tactically suitable timeframe and ensure the CB's MOB. This project will directly support the Sappers undertaking the dangerous task of route clearance and explosive hazard reduction. The proposed structure will enable the adequate distribution of Sappers across the force to provide expert advice and MOB support.
- **LAND 8120 Engineer Support Platforms – Plant.** Across the ADF, plant and MHE platforms will be replaced under this project. There is no planned expansion of platforms from the current C vehicle fleet. As previously mentioned, there will be no armoured plant delivered by this project. This lack of armoured plant will likely result in increased operational scope being asked of the Manoeuvre Support Vehicle (MSV) being delivered under LAND 400 Phase 3 and LAND 8160 Phase One Platforms. Although the new armoured platforms will have some CMOB and SURV capability, the proposed future structure retains plant capability that is structured to support the CB in conventional conflict.

Engineering Areas of Responsibility

Figure 1 is a 6 ESR developed perspective on the nature of engineer support in the operational environment. It provides a good representation of the responsibilities of individual engineer units across the engineer support spectrum. In developing the proposed new structure, this concept was drawn on to define the responsibilities between the CER and ESR. As the operating environment becomes less linear, the overlap of each sphere of responsibility leads to duplication in capability. Taking into account the aforementioned new capabilities and the of complexity each project being delivered, it is time for the Corps to make some tough decisions on what the CER and ESR delivers within their individual C-METL.

Consideration was also given to the operating in a high-end conventional conflict against a near peer adversary and some key questions were asked: What does the CB Commander expect of his CER? What unit in the Corps is best positioned to provide this support? Is there sufficient CE support available to the CB to claim we would or could support the CB in MOB, CMOB, SURV and SUST Support? In answering these questions two considerations have been made; firstly, the expansion of CE manning is not a priority against the many other manning pressures across Army and secondly, the IIP is locked in and will continue to face funding pressures across the ADF.

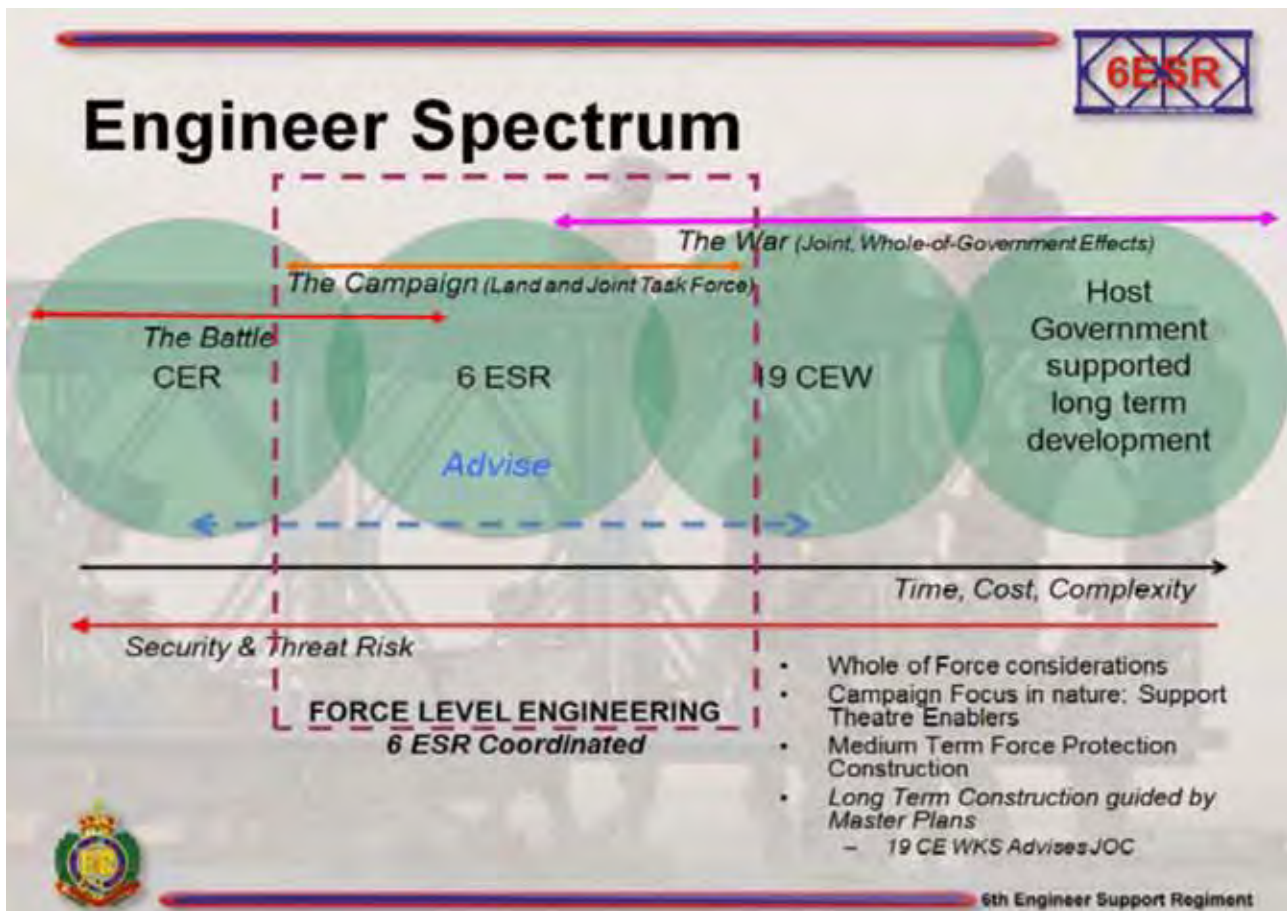


Figure 1 – Engineer Spectrum

From a raise, train and sustain perspective the CER may be able to manage to support the CB its current construct. However, this assessment is being made on the traditional employment of CE on exercises as discussed earlier it is an inaccurate assessment on the requirement for CE. If the CB was to deploy, there will be a requirement to attach capabilities from across the entire force to meet operational needs. It is assessed that the CER in its current structure in a conventional conflict would have insufficient CE to internally support the CB, even without taking into account attached assets. This will result in the requirement to source CE externally to meet the internal MOB, CMOB, SURV support requirements to the deployed CB. The proposed structure will enable the CER to provide CE support across the entire CB, in doing so achieving self-sufficiency. With SUST support to being provided (as required) by the ESR and any further engineer support for attached Combat/ Combat Support assets being a BYO CE concept.

Capability Requirements of the Combat Engineer Regiment

The proposed CER construct seeks to establish the primary task in support to the CB to be MOB, CMOB and SURV only, with no SUST support, except for directed disaster response (DR) tasks. These directed DR tasks, like water production, it is suggested are retained through individual qualifications only and the maintenance of these capabilities would be divulged to JLU. Acknowledging that there would be an annual training liability associated with the provision of the capability. Where a SUST capability is required, it is proposed the ESR groups the capability with the CER, or vice versa on occurrence. The result being that the CER (and the ESR) can direct effort toward their primary tasks, support to their parent brigade. The concept being that, the CER can concentrate on the critical functions expected of it by the CB and be experts in their delivery. In this proposal, the following tasks are assessed as primary CER tasks; dismantled search, demolitions, bridging (assault and LoC), tactical obstacle construction, fighting position construction, breaching (mounted, dismantled and urban), engineer reconnaissance and CBRND. All other engineer capabilities currently held within the CER it is proposed fall to the ESR, as per the concept in Figure 1.

The proposed 2030 structure

Figure 2 is the proposed structure of the CER to meet the needs of the deployable CB in 2030. As previously stated, there is no increase in manning required within the corps to achieve this new structure. Nor is there a loss of capability in the Corps, only refinement on the responsibilities in the delivery of Military Engineering to Army. The variation of operational structures and the Raise, Train and Sustain Model is acknowledged. However, the ability to successfully support the entire CB with MOB, CMOB and SURV is the priority. In researching this paper analysis was conducted into potential deployable structures in the timeframe 2028. Although these structures will not be discussed further due to their classification, it is evident that the CER within its current and proposed future construct will be unable to fulfil CB requirements alone. To contend with this requirement, the adoption of this structure across all CER will see the MOB, CMOB and SURV requirements expected of the CER by Army being met and allows for a workable reinforcement model.

Future of the Combat Engineer Squadrons

For discussion purposes, the following points are made in relation to the proposed structure:

- It is well known that the CE Sqn is the traditional construct for support to Battle Group (BG) within the CB, usually with a habitual relationship between the CE Sqn and supported BG. In recent years as Plans Beersheba and Keogh have been enacted, a third BG has been raised based on the Armoured Cavalry Regiment. In the past this has been addressed through assessing the Commander’s priorities

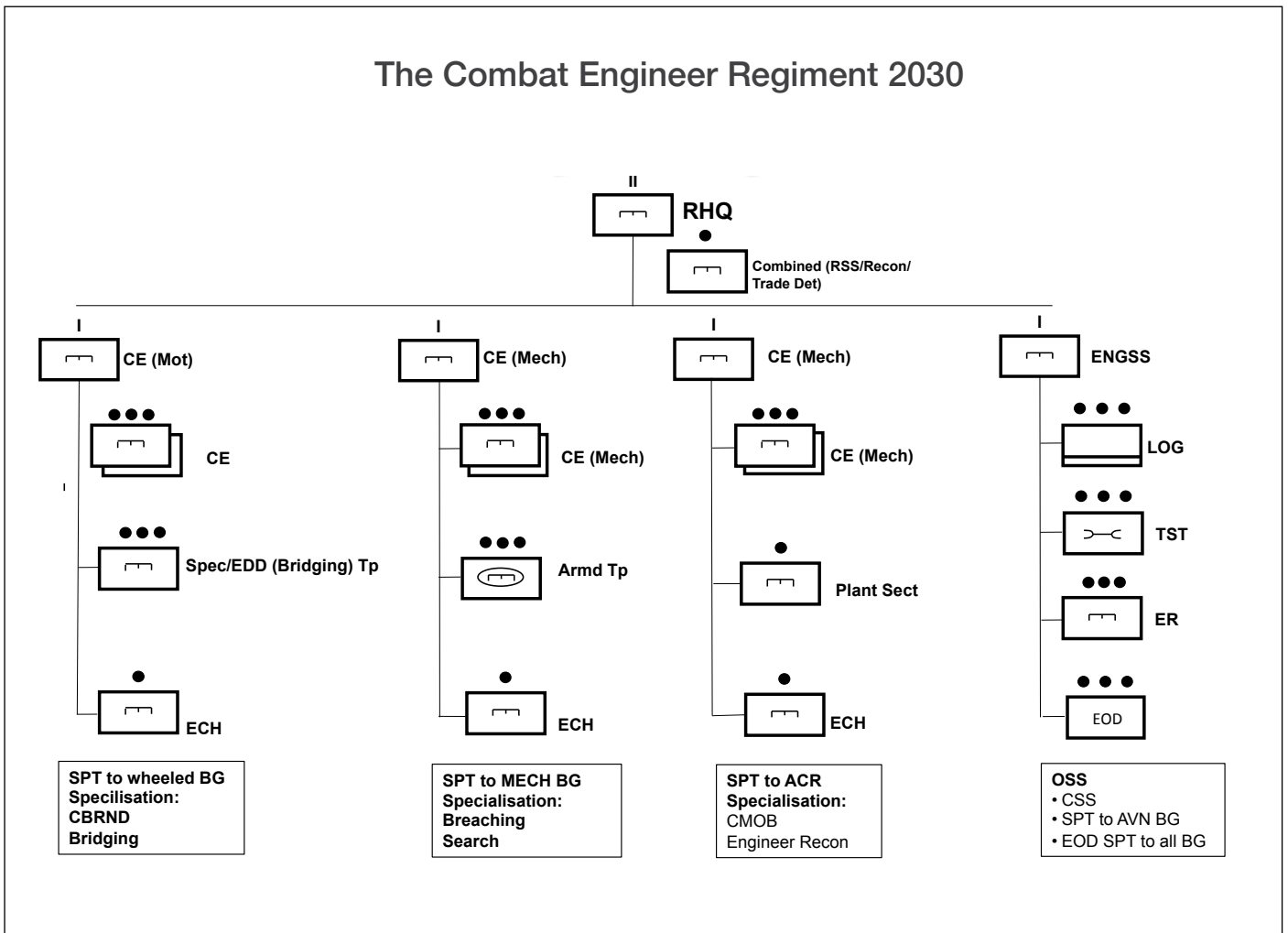


Figure 2 – Proposed CER 2030 Construct

and apportioning support and effort to achieve an effect. This decision has been made as there simply was not enough CE to meet the CB requirements. The proposed construct recommends that a third CE Sqn be established to support all BGs within the CB. Giving the CER the ability to fully support the ACR in whatever role they are tasked. Allowing CE dedicated MOB, CMOB and SURV support to the new LAND 907 and LAND 400 Phase 3 Platforms no matter the CB task grouping.

- The proposed structure allows the CER to apportion adequate effort to engineer reconnaissance well forward to providing MOB support and more importantly providing critical information rearwards to the main body. It will allow the renewed focus on CBRND to enable CE support across the entire force from the screen to the rear-guard. Resulting in all elements within the battle space having ready access to a CE element to assist with an immediate decontamination capability to survive surprise.
- As capabilities become more complex there will be a requirement to be experts in certain areas of Combat Engineering. With the proposed construct, each CE Sqn will be the lead for specialist capabilities as outlined in Figure 2. It is however, still expected that each of the CE Squadrons will be able to complete all traditional CE tasks in providing MOB, CMOB and SURV Support. Retaining the ability to transfer capability between CE Squadrons to task group to meet the support requirements of the supported BG's individual tasks. This will allow for the retention of the habitual relationships internal to the CB.
- The proposed structure comes at the cost of the Support Squadron. For the most part the CER will retain the capabilities that the Support Squadron brings to the CB. In doing so, it provides an existing headquarters structure, being manning neutral and allows the ESR to gain from the additional manning for the reduced trade requirement collectively across all CERs. The additional manning will be welcomed with the increased focus on International Engagement across our region and the possibility of raising a second Civil Engineer Works.
- It is proposed that vertical trade brick that is retained within the CER is employed Regimental Recon, enabling the internal capacity to provide structural assessment and HADR support. It will also allow for immediate advice to CE on more complex hasty construction tasks and trade recon well forward to provide early assessment for follow up action. Horizontal construction is proposed to be downsized to a section size element, with the principle task to fulfil CMOB and SURV tasks only. Seeing a significant reduction in plant platforms; retaining only MHE, blade teams (ICW 8160 platforms) and backhoe. With all platforms being transportable without the requirement for a heavy lift capability and able to be attached to any of the three CE Squadrons, dependant on task allocation.

Combat Engineer Troop

After much research on likely CE tasks whilst in support of a CT and discussion with colleagues, the overwhelming consensus is that a two-section troop could achieve all that may be asked of it by the Manoeuvre Commander. With the ongoing requirement to centralise for deliberate tasking such as; complex obstacle breaching, bridging and tactical obstacle construction. From a historical perspective; from WW2, Vietnam, through to Afghanistan the continuous theme is small splinter teams and section level groupings in support of the CT. Whether being the clearance of tunnels in Vietnam or clearing the route for tanks in SE Asia during WW2, small teams commanded by a senior Sapper or JNCO formed the basis of the majority of support tasks to the combined arms team. This concept has been continued within this proposal, with troop organisations being only two sections in strength. This has been done to ensure adequate CE coverage across the CB and remaining manning and equipment neutral for major platforms. Figure 3 identifies the proposed principal platforms for each of the CE Sqns. Within this paper the CSS construct has not been fully developed, however with the consolidation of CSS within the CB there would be a reliance on the supported BG assets. There is an opportunity to further reduce the number of platforms for the CE Squadron supporting the ACR with engineer reconnaissance elements being mounted in their integral platforms.

Conclusion

In researching this essay, I discovered it has been a significant time since radical change in the Corps has been undertaken. It is assessed that as the new capabilities roll out from mid-2020s the current structure and support to the CB will become more dysfunctional. Currently the CERs are undergoing a Capability Establishment Review, with no significant changes proposed and the next review is proposed for 2021. From capability and restructure perspective, a short time. Especially given the complexity of the size and complexity of the platforms being introduced into service.

Basic sub-unit platform construct (without RHQ and CSS construct)

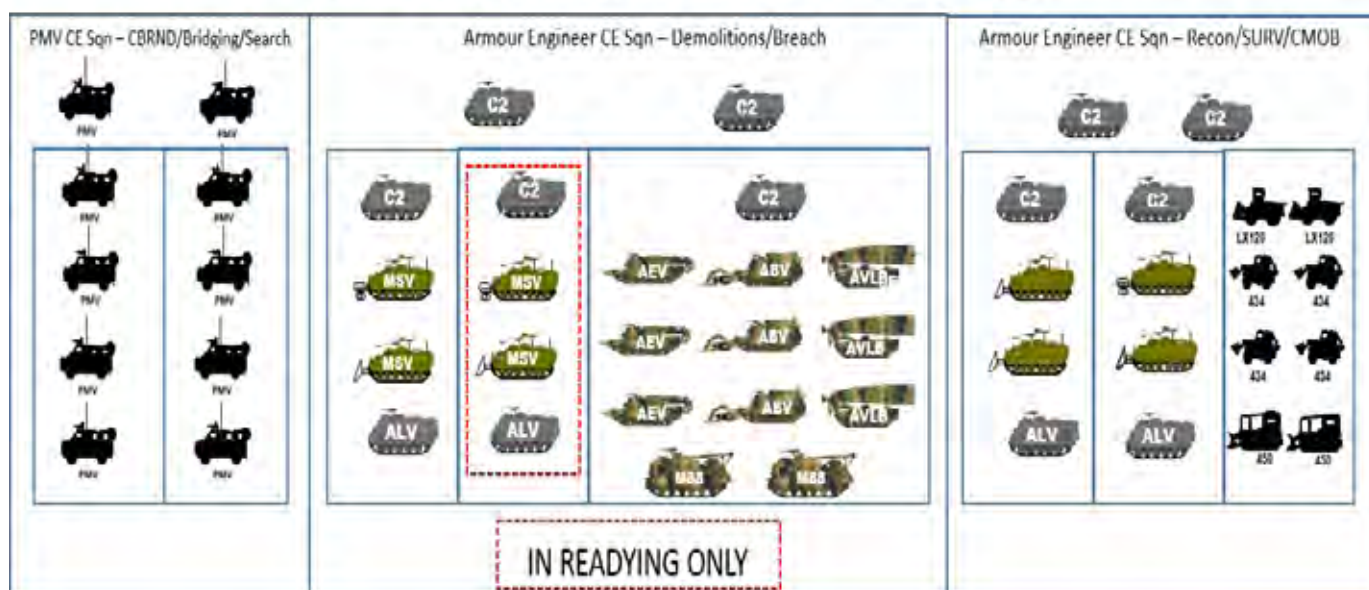


Figure 3 – Proposed 2030 CER Structure Major Vehicle Platform Allocation

As a result, the ability to effectively change will become more difficult due to the associated personnel and training requirements. Best case, in the do-nothing scenario will result in a forced restructure to meet Army’s needs. The worst case, being the loss of capabilities and positions from the Corps through our inability to employ the newly delivered capability to the CB due to the resistant to change. This proposal is not about empire building, it is ensuring a healthy future of the CER and the Corps more broadly. As shown by recent operations, the Sapper is critical to enabling the Brigade to move, live, fight and win in the modern operating environment. The CER must be experts in mechanised and dismounted operations, to achieve this the Corps must be open to doing this differently.

Bibliography:

- GEN Angus Campbell, AO, DSC Keynote Address delivered to ASPI war in 2025 Conference – 17 Jun 17
- 2016 Integrated Investment Program, Department of Defence
- Future Land Warfare Report 2014, Modernisation and Strategic Policy Division
- Land Warfare Procedures – Engineers 6-1-8, The Combat Engineer Regiment, 1998
- Defence Capability Guide 2012, Department of Defence



Title: Back Off He's Mine; Artist: MAJ Jeff Wharton

Back Off He's Mine

MAJ Jeff Wharton

MAJ Jeff Wharton is a lateral transfer from the Royal Engineers with over 40 years of military service, transferring in 2009 to the ADF and now working as a reservist within Army Headquarters. Serving in many countries and operational areas, he has always been an artist but with little time to get those important issues onto canvas or paper, mostly due to the operational tempo of his life. In Canberra he ran an Art Wellbeing Workshop for Soldier On, dealing with ADF, AFP and SES personnel suffering from mental health issues. Relying on his training as a British Army Welfare Officer he has been able to get their thoughts and feelings out by the use of different art mediums. This has alleviated the stress and anxiety felt by those individuals and to focus on their recovery.

This year he entered the Australian War Memorial 2019 Napier Waller Art Prize for ADF members with a pencil sketch "Back Off He's Mine" which was shortlisted and highly commended. The Sketch was chosen by Jeff to highlight the high rate of ADF suicides, and also those thoughts of anxiety and depression that are present in military life. In most cases this manifests itself as a Black Dog that hounds you to make the wrong choices, and is

ever a constant companion to those that feel disavowed and lost. The image shows a huge black dog dominating the centre of the domestic scene, quickly snapping its head around to the onlooker, looking over its shoulder as if it did not want to stop focusing on the occupant of the chair, even for a second. The sketch captures the menace in the dog, not only in its eyes and pose but also in what the title of the sketch invokes. The dog is thinking or saying "Back off, he's mine. Keep away, don't come near, he's a lost cause," and all these unsaid thoughts given with dripping venom, in order to keep away all those who see the downward spiral into drink and want to help. The drinker's feelings of shame are shown by hiding his face behind his hand: not to hide from the dog but from the onlooker.

Jeff believes that there is a healing power to art therapy that can help the road to recovery with insights, increase self-awareness and to the boost esteem of the individual. He uses it to rationalise his own traumatic ethnic cleansing and war fighting images that have had an impact on his lengthy military career. If you want to reach out to him he is happy to discuss any issue and the medium of Art Therapy – It's Good to Talk.

Richard Atkinson memorial unveiled



CPL Richard Atkinson's brother James and partner Daniel stand in front of the memorial.

Friends, family and fellow sappers of a Launceston man, affectionately known as Akka, who died while deployed in Afghanistan in 2011, have unveiled a memorial at Kings Park.

More than 18 months' work went into the memorial, with a determined bunch of Richard Atkinson's mates working to get the Afghanistan Combat Engineers Memorial off the ground.

Akka's "flair for life" was at the forefront of the unveiling held on Wednesday. Those who knew him worked late into the night and early in the morning to make sure the finishing touches were on the memorial in time for Anzac Day.

Jamie Twidale was one of the 40 people that helped complete the project. He thanked Launceston's Tom Pedley and Johnno Morrison who gave their time to help build the memorial in their friend's honour.

"I only knew him a little bit, he served in

my unit in Darwin and then he deployed overseas with a different unit," he said.

"I met Richard... just before he left. He was very likeable and loved his footy, liked a laugh and loved baked beans, and in the memorial there is a tin of baked beans buried as well."

Mr Atkinson's brother, James, said the memorial meant a lot to his family.

"For me it's about returning here in the future, and not only remembering Richard, but also everyone else's sacrifice," he said.

"It's also about remembering that Richard used to live life to the full and it will remind me to do the same."

The memorial is part of a Bailey Bridge, which is used to protect and enable movement through battlefields.

At age 22, Corporal Atkinson was the first Tasmanian to be killed in Afghanistan. Part of his



role was to find the bombs and make it safe for the rest of the infantry who were to follow and all the others who later trod the same ground, such as medics and other service personnel.

James Atkinson spoke on behalf of his parents at Wednesday's memorial unveiling.

"No one can ever ready themselves for the loss of a child, or the shock and profound sadness that is still with us today," he said.

"Time has allowed us to look back and celebrate Richard's short life and all he achieved.

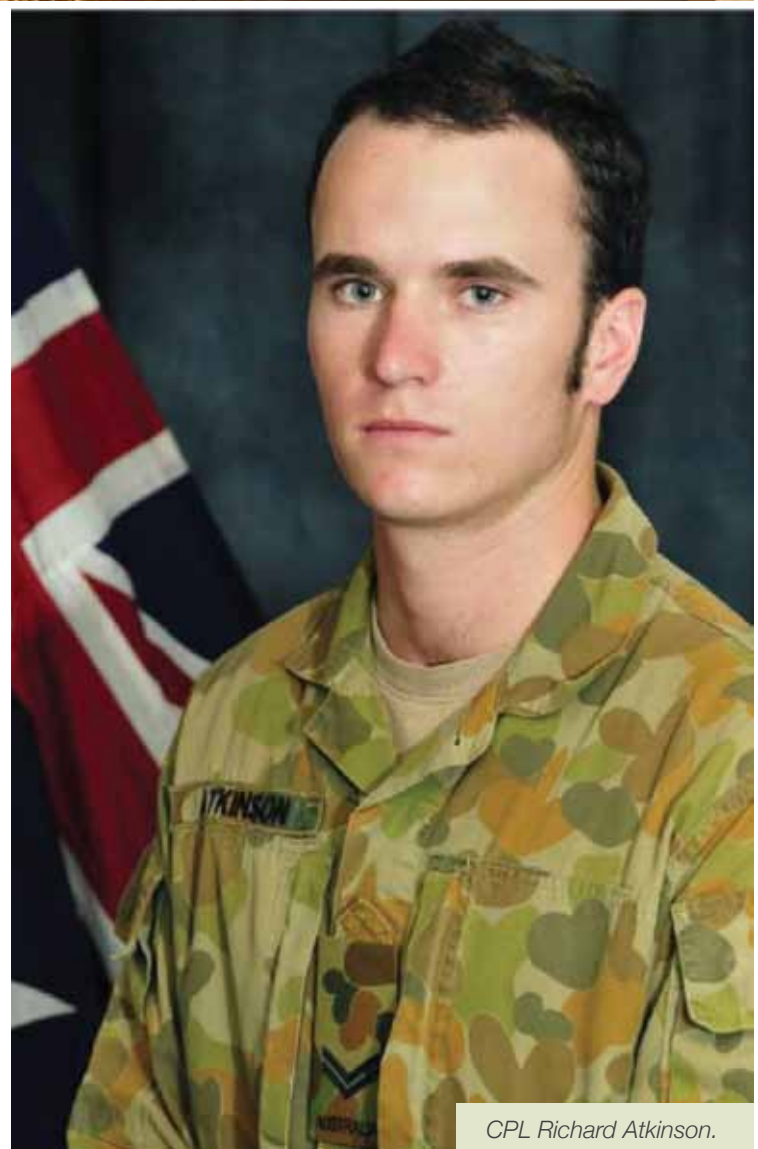
"Many knew him... you too know what a wonderful young man he was and the great potential he had.

"Most of all, he was great fun to be around and lived life fully."

The Atkinson family thanked everyone involved in the project from its inception to the final few weeks of the build.

"It has been a big challenge for all involved and even for the last few weeks may have fallen over at the last hurdle," James said.

End note: This article was first published in the Examiner, reported by Tarlia Jordan and photography by Neil Richardson. We thank them for the permission to publish the article in Sapper 2019.



CPL Richard Atkinson.

Personnel Matters

Awards

Member (AM) in the Military Division of the Order of Australia

Brigadier David John Wainwright, DSC

Commendation for Distinguished Service

Brigadier Rupert John Hoskin, AM

Major David Phillips

Conspicuous Service Cross

Lieutenant Colonel Nicholas Brown

Lieutenant Colonel Kenneth Golder

Conspicuous Service Medal

Lieutenant Colonel John Lloyd Venz

HOC Commendation

Corporal H Brien

RAE Prize Winners – RMC

November 2018 – LT John Weston

July 2019 – LT Natalie Johnston

RAE Excellence in Military Engineering Awards

Brigadier General CH Foote CB, CMG award for an individual who has rendered outstanding and significant support or service to the Corps of Royal Australian Engineers is awarded to Colonel J Wertheimer (Retd)

Lieutenant General FJ Hickling AO, CSC award for *Most Outstanding Engineer* is awarded to Corporal M Sullivan (3 CER)

Major General S Day DSC, AM award for *Most Outstanding Lieutenant ARA* is awarded to Lieutenant TS Gallagher (2 CER)

Warrant Officer Class 2 RC 'Mick' Mace MM, BEM award for *Most Outstanding Non-Commissioned Officer ARA* is awarded to Corporal M Sullivan (3 CER)

Warrant Officer Class 1 B Wade OAM, CDS award for *Most Outstanding Sapper ARA* is awarded to Sapper R Stevens (6 ESR)

Colonel AH 'Sandy' McGregor MC award for *Most Outstanding Lieutenant ARes* is awarded to Lieutenant TM Bracs (3 Fd Sqn)

Warrant Officer Class 1 R 'John' Raddatz OAM award for *Most Outstanding Non-Commissioned Officer ARes* is awarded to Corporal L Jackson (3 Fd Sqn)

Sergeant M Chalk MG award for *Most Outstanding Sapper ARes* is awarded to Sapper A Gray (22 ER)

RAE Sporting Awards

RAE Sports Person of the Year is awarded to Sapper R Morris (1 CER)

Rising Star Award – Sapper G Hauck (2 CER)

RAE Coach of the Year is awarded to Sapper M Beddie (2 CER)

RAE Official of the Year is awarded to Warrant Officer Class Two B Prowse (1 CER)

Contribution to Corps Sports is awarded to Major S Reid (3 CER)

RAE Sapper Competition

Winners: Lance Corporal M and Sapper N (SOER)

2nd Place: Sapper Franks and Sapper Thorburn (6 ESR)

3rd Place: Corporal Totten and Corporal Henry (SME)

4th Place: Lance Corporal Bradford and Sapper Boyd (2 CER)

5th Equal: Lance Corporal Moss and Sapper McFaden (1 CER)

5th Equal: Corporal Donnelly and Lance Corporal Adams (3 CER)

7th Place: Lance Corporal Carpenter and Sapper Meyer (3 Fd Sqn)

Promotions

DOCM-A No details provided

DSCM-A No details provided

Sapper Obituaries 'Lest We Forget'

Serving in the RAE at the time

Warrant Officer Class Two Gregory James Miller passed away on 06 September 2019. WO2 Miller enlisted in the Australian Army in 1998 and was allocated to the Corps of Royal Australian Engineers. After initial training, he conducted his first posting at 1 CER. WO2 Miller pursued his passion for Engineering through further postings to the School of Military Engineering, the Incident Response Regiment and the Special Operations Engineer Regiment. He was a champion for the soldier in his role as Squadron Sergeant Major and excelled at creating networks with the civilian police services across Australia. Sadly, Greg completed his life alongside his wife Jocelyn. He is survived by his parents and sister and our thoughts are with them at this difficult time.

Colonel Robert Sanders passed away on 17 October 2019. COL Sanders joined the Australian Regular Army in 1992, graduating from the Royal Military College Duntroon in 1996 to the Royal Australian Engineer Corps. Throughout his career, he commanded Engineers at every level up to Commanding Officer, 3rd Combat Engineer Regiment. He also served in a variety of staff roles in Army Headquarters, Land Command and Military Strategic Commitments, touching the lives of many along the way. COL Sanders leaves behind his wife Gail and son Matthew. Our thoughts are with them at this difficult time.

Previously served in the RAE

Frank Smith passed away 05 August 2018 and served with 1 Fd Sqn 1968/1969 and 1971.

Vernon George 'Whitt' Tuskin passed away on 14 November 2018, aged 97 years 8 months. Whitt served in the Middle East, Ceylon and PNG during WW2 from April 1941 to December 1945 with 2/8 Fd Coy.

George Biddlecombe passed away on the 26th of August 2018.

Raymond K Bear passed away in December 2018.

Cecil Weekes passed away 05 December 2018. He was a signaller on landing craft during WW2 and a long serving President of the Australian Water Transport Association.

Colin Bruce 'Meggsie' Dennis passed away on 2 January 2019.

Michael George 'Mick' Lee passed away 12 January 2019, aged 73 years 6 months. Mick served with in South Vietnam from September 1965 to March 1966 with 3 Fd Tp. Mick grew up in South Perth but had been living in Bali for the last 18 years and suffered a massive stroke 2 days before his passing.

Anthony John 'Tony' Sutton passed away on 17 January 2019, aged 76 yrs 5 months. Tony served in South Vietnam from January to August 1967 with 21 Engr Spt Tp. He also served in Borneo from July to December 1965 with 24 Const Sqn.

Fred Milkins passed away on 22 January 2019 at the Royal Freemasons Nursing Home aged 85 years.

Paul 'Glasgow' Harrison passed away suddenly on 29 January 2019, aged 52 yrs. Paul was a Sapper in 13 Fd Sqn from 1985 to 1989.

Merv Ballans passed away 30 January 2019. He was posted to 32 Small Ship Squadron and served in South Vietnam on AV1356 Clive Steele in 1968 and AS3051 John Monash on two trips in 1968/69.

Francis George Taylor passed away on 30 January 2019, aged 99 years. Francis served in WW2 in New Guinea and Bougainville with 15 Fd Coy (3 Div) as a Sapper and received a commission as Lieutenant.

Zygmunt John 'Ziggy' Gnoit passed away on 8 February 2019, aged 71 years. Ziggy was born in Germany but loved Australia so much that he joined the RAE, he served in South Vietnam from October 1970 to October 1971 with 2 Tp, 1 Fd Sqn.

Colin 'Darcy' Darroch passed away on 12 February 2019, aged 72 years 6 months. Darcy served in South Vietnam from December 1967 to December 1968 with 17 Const Sqn and again from August 1971 to January 1972 with 1 Fd Sqn.

Terry M Cook passed away on 19 February 2019, aged 60 years. Terry enlisted on the 17 May 1978 as a fire fighter. His postings include 1RTB, SME, 3ARU, 1 AVN REGT, Army TAFE, 21 Construction Squadron and he discharged on the 31st of May 1998. Terry passed away in the loving presence of his wife Rina and children Aaron, Rossco and Lisa after a long battle with illness.

Kevin John Cashion passed away on 28 February 2019, aged 87 years 5 months. Kevin served in South Vietnam from April 1966 to April 1967 with 17 Const Sqn.

Claude Mervyn Wright passed away on 02 March 2019.

Andrew Seymour 'Andy' Toms passed away on 3 March 2019, aged 69 years 3 months. Andy served in South Vietnam from January 1970 to August 1971 with 17 Const Sqn.

David Eakin passed away on 03 March 2019.

Henry William Burton 'Harry' Eustace passed away on 11 March 2019, aged 73 years 6 months. Harry served in South Vietnam from January to October 1971 with 1 Fd Sqn.

John Anthony Cross passed away on 16 March 2019, aged 71 years. John served in South Vietnam from October 1970 to August 1971 with 1 Fd Sqn.

Reverend Canon Graeme Winterton AM passed away on 21 March 2019. Graeme was RAE (S Region) chaplain attached to 6 Engr Gp 1988-1991.

Mike Price RE passed away on 24 March 2019. Mike was a Royal Engineers exchange instructor

at SME in about 1971-73 and worked in Ops Wing generally doing promotion courses.

John Simon 'Snow' Wilson passed away on 28 March 2019, aged 77 years and 5 months. John served in South Vietnam from January 1967 to July 1967 with 17 Const Sqn and from July 1967 to December 1967 with 1 Fd Sqn.

Kevin William Bosse passed away on 29 March 2019, aged 68 years. Kev was a 22nd Intake Army Apprentice carpenter and joiner.

Russell Bee passed away on 04 April 2019. Russell served with the Australian Army Training Team South Vietnam from 1966 – 1967 National Police Force Training Centre, Trai Mat near Dalat and the S-4 Air, C Team, 5th SFGA, Marble Mountain, Danang.

Berhard 'Bernie' Dieter Bickel passed away on 7 April 2019. Bernie served in South Vietnam with 17 Const Sqn 1966 – 67, 1 Fld Sqn 1971 and 55 Engineer Workshop and Park Squadron 1972.

Glenn Linden 'Rocky' Roberts passed away on 13 April 2019, aged 73 years. He was a 15th Intake Army apprentice and served in New Guinea with 22 Const Sqn.

John Collin 'Bob' Isager passed away on 13 April 2019, aged 73 years 11 months. Bob was a 16th Intake Army Apprentice Carpenter & Joiner. He served in South Vietnam from October 1970 to September 1971 with 17 Const Sqn. Bob also served in PNG at Lae in the late 1970's.

Neal Harris passed away on 14 April 2019, aged 74 years 7 months. Neal was the Army Liaison Officer on HMAS Sydney when it sailed to Vietnam in September – October 1965. He also served with HQ Aust Forces South Vietnam from July 1971 to February 1972.

John Edward Webster passed away in April 2019. John was a Sapper Apprentice.

Frank George Nitarski passed away on 12 May 2019.

John Bending passed away on 23 May 2019, aged

88 years 6 months. He was a West Australian, born in North Fremantle. John served in South Vietnam from October 1969 to November 1970 with 1 Fd Sqn.

John Haken passed away on the 28 May 2019.

Trevor Leslie Duckett passed away on the 11 June 2019. Trevor joined 1 RTB on 17 Apr 1973 and served in the following RAE units throughout his military career; SME, 3 Fd Sqn, 21 Const Sqn, HQ 5 Military District, 17 Const Sqn, HQ 2 Military District, District Spt Unit Puckapunyal, District Spt Unit Hobart and Defence Centre Hobart.

Neville Raymond Flintoff passed away on 13 June 2019. Neville served between 1962 and 1970 with 21 Const Sqn and also served with Chief Engineers Southern Region and several Engineer Units. Neville was passionate about being a sapper and was a long-time supporter of the Old Sappers Association where he was granted honorary life membership - that honorary membership transferred across to the RAE Association (Vic) Inc.

Gordon Thomas Foster passed away on 14 June 2019. Gordon served in South Vietnam with 1 Fd Sqn and 17 Const Sqn from 1969 – 1970.

Ian Noel Robertson passed away on 24 June 2019.

Charles Peter 'Chuck' Bonzas passed away on 1 July 2019, aged 72 years and 7 months. Chuck was a National Serviceman and served in Vietnam from December 1967 to December 1968 with 1 Fd Sqn.

Donald John Duffus OAM passed away 04 July 2019, aged 71 years and 9 months. Don served in Vietnam from June 1969 to June 1970 with 17 Const sqn.

Peter Raymond Lofthouse passed away 11 July 2019, aged 83 years and 4 months. He was a Western Australian, born in East Fremantle. Peter served in Vietnam from April 1970 to April 1971 with 17 Const Sqn.

Neville Geoffrey Handley passed away 31 July 2019. Neville joined as a Sapper but then changed career streams and became a cook and served with 91 Forestry Sqn for in excess of 30 years.

Frank Charles Mallard passed away 10 August 2019, aged 74 years and 2 months. He was a Western Australian, born in Geraldton. Frank served in Vietnam from September 1965 to September 1966 with 3 Fd Tp and 1 Fd Sqn. He was also a proud Yamatji Elder and WA Senior Citizen of the Year for 2019.

Charles Edward Munt passed away in early August 2019.

Michael Grubb was reported lost at sea in August 2019. Michael was a member of 13 Fd Sqn from 2003 - 2005.

Peter Allan Connors passed away 22 August 2019. Peter served in South Vietnam with 17 Const Sqn 1967 – 1968 and 1 Fd Sqn 1970 – 1971. Peter also served as the RSM on SME in 1986.

Lawrence Barton 'Lawrie' Wright passed away on 25 August 2019 aged 83 years. Laurie was a 7th Intake Army Apprentice electrician and served with 22 Const Sqn, Independent Const Tp PMG and 32 Small Ships Sqn.

Darcy McKenzie passed away on 28 August 2019, aged 71 years and 7 months. Darcy served in South Vietnam with 1 Fd Sqn 1970 – 1971.

Bryan Henry 'Bret' Nolan passed away on 31 August 2019, aged 86 years. Brett was called up for 1st National service intake 1953, returned home and after having a blue with his brother left the farm and joined the regular Army 1956. Posted to 21 Const Sqn, LWC where he trained members deploying to South Vietnam and with 1 Fd Sqn 1967 – 1968. Brett also deployed to New Guinea, SME and the Royal School of Military Engineering (RSME), Minley England where he was presented with his WO1 rank by her Majesty Queen Elizabeth II. Brett discharged in 1990 at his first unit, 21 Const Sqn, but continued to support the Defence Force by volunteering to work with a local reserve unit and built up their Pioneer platoon.

Peter Murphy passed away on the 07 September 2019. Peter joined the Army in 1973 as an Officer Cadet and graduated in 1976 and served in 2 FER, HQ 2MD, John Holland exchange in Darwin,

MAT DIV Canberra and back to 2 FER. He resigned his commission in 1986 to work in private enterprise in Australia and overseas.

Peter Vandenberg passed away on 13 September 2019 aged 71 years. Peter served in Vietnam from March 1970 to March 1971 with 1 Fd Sqn.

Richard Gass passed away on the 28 September 2019 aged 45 years. Richard enlisted in 1989 as an ARes member and separated in 2013. He served in 35 Fd Sqn IRR, 17 Const Sqn and 6 ESR.

Robert James Auer passed away on 01 October 2019. Bob served with 51 Inf Bn RQR, 17 Const Sqn and 24 Const Sqn

Gerald 'Gerry' Arthur Betts passed away 12 October 2019. Gerry served as a Reservist for 38 years and achieved the rank of Captain and served in 7th Field Engineer Regiment

Terry Evans passed away on 16 October 2019. Terry served in South Vietnam in 1971 with 1 Fd Sqn Gp.

Alan Edward White passed away on 17 October 2019. Alan joined the Army in January 1962 as an Officer Cadet and graduated in December 1965. He served in the following units, HQ Central Command, Commander Regional Engineers Central Command, 7 Fd Sqn, 1 Fd Sqn, 3 Fd Sqn, HQ 4 Mil District, Royal Military College of Science UK, Materiel Branch Army Office and 4 Training Group. He served in South Vietnam with 1 Fd Sqn from March – Nov 1971.

Colin Micheal Campbell passed away on 01 November 2019. Colin served in South Vietnam with 1 Fd Sqn from Dec 1967 – Dec

James 'Jimmy' Robert Brown Passed away on 14 November 2019. Jim was a national serviceman that served in 32 small ships and spent time in Vietnam on the John Monash and the Clive Steele.

Bill Watson passed away on the 15 November 2019. Bill entered national service in 1969 and graduated from the Officer Training Unit (Scheyville) later that year. From Scheyville, he was posted to RAINF where he served out the remainder of his two year term. Bill was the grandson of LT Stanley 'Stan' Holm Watson who with several 2nd Australian Field Company Sappers constructed the first pier at ANZAC Cove using a diffused Turkish shell as a pile driver. The pier was completed on 18 June 1915 and named Watson's Pier. LT Watson was also given the responsibility for the lines covering the ANZAC's withdrawal on the nights of the 18 and 19 December 1915 for which he was mentioned in dispatches for 'Distinguished and Gallant Services' in the evacuation of Gallipoli. Bill did not serve in the corps, but had a long association with it over the years.

Christopher Ford passed away on 16 November 2019. Chris served in the HQ Australian Force Vietnam (Army component).

John 'Jack' Graham Green passed away on 27 November 2019. Jack served in 1st Field Squadron Vietnam during 1967.



AUSTRALIAN A

Our Role

To collect, preserve and e
the history of the Corps
Royal Australian Engine
Royal Australian Survey





ARMY MUSEUM *of* MILITARY ENGINEERING

Exhibit
of
Sappers and the
Corps

Public Access

The museum is open to the general public. Visitors without a Defence Pass are to meet at the Holsworthy Barracks Pass Office.

Current, government issued photo identification will be required for all visitors over 16 years of age.

Group bookings are essential, other visitors are advised to call to confirm timings.

Location:

Macarthur Precinct, Soldiers Way, Holsworthy Barracks, Holsworthy (Enter via Heathcote Road)

Contact:

Tel: 02 8782 8822 Fax: 02 8782 8842
Email: AAMME.mailbox@defence.gov.au

Hours:

ADF Members and Defence Civilians:

Monday to Friday,
9am to 3pm

General Public:

Tuesday, Thursday and Saturday
Visits commence at 9:45am and 12:45pm

Other times can be arranged
by appointment

Returning to the Pacific

International Policy Division – Infrastructure Team

LTCOL Glen Billington, CAPT Larissa Cody, CAPT Liam Clarke

Introduction

In November 2018, the Australian Government announced a renewed focus on the Pacific Region. Although these announcements featured many lines of effort, one of the largest, tangible and most significant lines was that of infrastructure to support neighbouring regional security forces.

As the ADF's only engineering project management and design unit capable of supporting such infrastructure planning in short notice, 19th Chief Engineer Works (19 CE Works) led the planning phase in the later part of 2018. The ability to rapidly partner with industry and support International Policy Division (IP Div) develop short notice plans and costing demonstrated the utility of this capability and helped set the conditions for subsequent announcements and commitments by Government to the nations of Fiji, Vanuatu and Papua New Guinea (PNG). As the scale of these announcements, and potential future commitments, crystallised, Defence recognised the need to step up a planning and decision support team within IP Div. This requirement set the conditions for an entirely new team to be established.

Infrastructure and Contracting Cell – International Policy Division

With the 'Pacific Step-Up' in full flight, an entirely new section comprising of RAE Officers was established from January 2019. Based in Russell Offices, Canberra, as

part of the Indo-Pacific Enhanced Engagement Branch (IPACE) the team comprised of Colonel Jason Hedges, Lieutenant Colonel Glen Billington, Major James Scott and Captains Larissa Cody and Liam Clarke. The primary focus of the team was to support the programme level planning and execution of major infrastructure projects in the region. With 19 CE Works leading and fulfilling the Project Management and Contract Administration function for the delivery of initial projects in Fiji, Vanuatu and PNG, this enabled the IP Div team to support the programme management function, establish the required governance framework, and plan how to best support both the Division and Government in achieving stated strategic objectives.

Throughout 2019, the role and composition of the team has matured. The addition of Australian Public Service members and an industry partnership model has seen the size grow to 12 full time personnel with industry specialists contributing at selected opportunities. Originally charged with the oversight of delivery of the three key projects, the section's remit has now expanded to include support to the planning and delivery of all international infrastructure projects to best support Defence international engagement efforts. By October 2019 this remit has included:

- Blackrock Camp (Fiji) – 19 CE Works
- Maritime Essential Services Centre (design led by 19 CE Works)
- Vanuatu Infrastructure upgrades – 19 CE Works
- Lombrum Naval Base redevelopment (early works) – 19 CE Works
- Lombrum Naval Base redevelopment (main works)
- Pacific Maritime Security Program (infrastructure) – delivering the upgrade of wharf infrastructure for the Guardian Class Patrol Vessels in the nations of PNG, Vanuatu, Fiji, Solomon Islands, Kiriabti, Tonga, Cook Islands, Tuvalu, Republic of Marshall Islands (RMI), Federated States of Micronesia (FSM) and Samoa
- Patrol Boat wharf and base master planning for Timor Leste Defence Force.

At this time the habitual exercises led by the Combat Engineer Regiments are not included in this remit, although their significance and importance as an element of RAE international engagement should not



CAPT Larissa Cody at Loda Wharf HOTO



*CAPT Larissa Cody
conducting a School Survey*

be understated. Such exercises form the foundation of partner nation connections that come through long term repeated engagement as peers.

What does this mean for RAE?

The creation of a dedicated infrastructure team within IP Div recognises the unique nature and need to co-ordinate project delivery centrally, rather than through silos of well-founded, but often confused and unprioritised initiatives. The specialist nature and framework to deliver construction works in an international context is also a key differentiator between the IP Div team and those posted to E&IG who focus on major capital works within the domestic barracks environment. In addition to project delivery, the team is also an enabler for IP Div as a supporter of policy advice and the development of engagement strategies that best support Defence objectives in the region. This ensures that considerations relating to infrastructure and engineer effort are incorporated from the inception of strategic planning, rather than much later in the process as has occurred in the past.

As the framework and model matures further with time, it is envisaged that this new initiative will transition to a 'business as usual' model and serve to support the Corps more broadly in the provision of policy advice, funding co-ordination, and as a repository

for both technical and country specific information that can better support future Corps tasks.

Conclusion

The inception of an RAE led team, blended with industry and public servants, located in the strategic centre of Canberra, designed to best support future plans, is arguably long overdue. The tangible and symbolic effects that the Corps has always delivered do not simply 'appear' without dedicated and diligent planning. To many, this simple and obvious fact is often overlooked when the ribbons are cut, however through careful centralised planning and decentralised execution there is no reason why engineer effects, whether this be in the form of infrastructure or some other capacity building activity, will not remain a stalwart of Defence international engagement strategy.

The Corps has an enviable long history of planning and delivering engineer effects around the world. This history has prepared all members, regardless of rank or employment nature, well for this new direction. Long term success is not the sole responsibility of a few, rather achievement will come from the collective efforts across the Corps. Although structures and roles will adjust and adapt with time, it is fast becoming clear that 2019 represents a significant change in direction and focus for the Corps of RAE.

Building great engineers

Brigadier John Carey

The purpose of SAPPER 2019 was to build the future of the Corps; support Army and Joint Force initiatives, especially modernisation and establishment; enhance learning and professional development; promote fellowship and esprit de corps; celebrate RAE's achievements, traditions and history; and connect senior leaders, junior leaders and alumni into the Corps 'circle of life.' The theme of the conference was 'Building Great Engineers' which sought to nest with Army in Motion and posture the Corps to be ready now and future ready with capabilities and capacity to enable Joint Force success.

Guiding principles were drawn from the Chief of Army's Army in Motion strategic guidance 2019 and were complemented with input prior to the conference from both Commander Forces Command and Head Land Capability.

To achieve these desired ends – five work groups led by an O5 and mentored by either an RAE O6 or O7 were established. These work groups employed the analytical framework from the book 'Good to Great' by Jim Collins as part of their deliberation. Each group had a healthy mix from all elements of the Corps, and Army, and importantly included officers, warrant officers, SNCOs & JNCOs. Teams were to take a blank sheet of paper and with unconstrained thinking: (1) Identify low hanging fruit and quick wins (2) Identify what we do not know and need to investigate (scope out research paper topics to leverage our Engineers who are going to school and need topics) (3) Determine best practices wherever they may be found (4) Think different; as we develop the way ahead. They were to 'Steal (Good) Ideas Shamelessly (SIS), Share (Good) Ideas Willingly' (SIW), communicate transparently, brainstorm (there are no dumb ideas), cross-talk, collaborate and inform one another. A final step was the requirement to deliver an action plan back-brief to the Head of Corps, RAE O7s, and all our SAPPER 2019 colleagues on the final day of the conference for dialogue and sharing of ideas.

On top of all the learning and hard intellectual work, we had a great time of celebration, fellowship & remembrance. Highlights included:

- Awesome speakers, who stretched our brains, challenged our conventional thinking, and informed us. The Chief of Army's guidance was contextualised with briefings from specialists on

Accelerated Warfare, Training Transformation, Lessons from Afghanistan, Army leadership, Engineer Modernisation and People Capability.

- Interaction with Industry partners (Engineers Australia and John Holland), who highlighted how keen they were to assist and enable us with material, educational and technology solutions and support.
- Breakout Sessions between all ranks to review where we have been and where we want to go.
- First-rate PT with ROBC/IETs, with plenty of push ups & burpees...
- CO SME Reception & Wine Tasting which pulled together senior officers, and CO/ RSMs in a wonderful social event.
- Tours of the School of Military Engineering and the RAE Corps Museum.
- Chief of Army Address – he was made an Honorary Sapper - and made clear he is keen for us to lead the way as part of an Army in Motion and get after it through various initiatives.
- Memorial Service, in honour of all fallen Sappers who have made the ultimate sacrifice.
- The 104th Waterloo Dinner, a 'Circle of Life' event where we welcomed the ROBC into the traditions of the Corps and honoured Colonel Sandy McGregor, MC of Tunnel Rats fame.

SAPPER 2019 was a well-executed and supported activity with prescribed outcomes designed to shape the RAE's collective work plan for 2019 and beyond. Big thanks must go to Major Clive 'Jim' Riddle and Lieutenant Colonel Dave Evans for their hard work and planning. The Conference provided an ideal forum for unconstrained discussion on future roles, training and education, employment and retention and our strategic narrative to nest in the Army in Motion concept. With the progression of the various outcomes from SAPPER 2019, RAE will be postured to deliver combat and force support engineering for the Joint and Integrated Force. SAPPER 2020 is already being planned and is scheduled for 28 – 30 April 20. All members of the Corps – serving and ex-serving - and from elsewhere in Army, are welcome to participate. Further guidance and direction will be issued early in the new year.

Turning the flywheel, building great engineers – findings and preliminary recommendations from *SAPPER 2019* work groups

Lieutenant Colonel John Venz CSM, Lieutenant Colonel Paul Pembroke, Lieutenant Colonel Scott Jamieson, Lieutenant Colonel Dave Evans and Lieutenant Colonel Henry Stimson CSC

According to one member, if you missed *SAPPER 2019*, you missed the best RAE Corps Conference in over a decade (The attendee had only been to the last ten!)

The following are just some of the initial findings and preliminary recommendations developed at the School of Military Engineering during *SAPPER 2019*, 'Building Great Engineers.' While many of the ideas have yet to be finalised and are still progressing, the intent of this article is to inform the Corps on their current status and proposed way ahead in an era of persistent conflict, competition and cooperation.

The five work groups were as follows –

- Future Roles, Missions
- Accessions
- Training and Education
- Employment and Retention
- Strategic Communications

Future roles, missions work group

Group leader: Lieutenant Colonel Evans is the Commanding Officer / Chief Instructor of the School of Military Engineering. He has had regimental postings within the 3rd Brigade, Joint Incident Response Unit (JIRU) and the Incident Response Regiment (IRR); as well as overseas postings to the UK Royal School of Military Engineering (RSME) and the US Joint Improvised Threat Defeat Organisation (JIDO).

'Do we have the right engineer units, organisations, staffs and individuals to deliver full spectrum engineering at every organisational level, in every mission requirement?' 'Is the Corps prepared appropriately for future threats?' 'Are we challenged when it comes to synchronising and planning full spectrum engineering?' 'Are we resourced appropriately for all missions, and if not, is there another organisation that can provide?'

The Future Roles, Missions work group primarily considered the missions engineers are tasked to perform and was the key driver in pursuing a wider holistic, cradle-to-grave approach with the goal of effectively managing our most important resource – people.

This effort included an assessment of the enduring Engineer Tactical Task List; consideration of Army Objective Force 2028; current / future modernisation initiatives; and supported complementary preparation for the RAE Capability Establishment Review (CER) 2019. It was quickly identified that as a Corps we need to more effectively employ the SERCAT 3 & 5 workforce. RAE SERCAT 5 workforce for example comprises 44% of the Corps. However, a limitation was that while training potential existed in the SERCAT 3 & 5 workforce (especially construction), capacity for additional equipment liability was limited.

Another key assessment was that as new capability enters Army, the Corps will need to relinquish and/or transfer emerging and extant capabilities to other organisations. For example, take Army Work Diving. We need to modify its concept of employment in order to be more relevant, and/or transfer the capability into 1 Division in support of 2 RAR or force concentrate into perhaps 6 ESR. There was a need to confirm with HQFORCOMD/HQ 1 DIV the future arrangement for the Littoral and Riverine Survey Squadron (LRSS). It still lacked a credible concept of employment and perhaps should be used as offset to support other establishment positions, especially in works and construction.

The Corps should investigate industry options to support the provision of partnered niche capabilities in deployed environments for protracted operations, for example water purification. Similarly, we need to investigate coalition options to address the capability gap of Counter Mobility that RAE cannot provide at this time or for the foreseeable future. Investing in and maintaining partnerships with regional and coalition partners, industry stakeholders, academia and Defence Science and Technology will ensure a collaborative approach to future combat and force support engineering effects.

Another important point was that we should retain our extant RAE workforce in order to allow specialisation with emerging capabilities; for example Armoured Engineering (L8160) will require a significant training investment across all elements of the Corps. Finally, the work group identified the critical nature on leveraging off the 2019 CER to support future investment for works and construction engineers, especially as Government seeks to provide greater capacity building and infrastructure support in the Indo-Pacific region.

Accessions work group

Group leader: Lieutenant Colonel Venz CSM is the Commanding Officer of the 6th Engineer Support Regiment and is a chartered professional engineer. He has also had postings with 19th CE Works, 3rd Combat Engineer Regiment, Headquarters Joint Operations Command and US Army Pacific.

‘Does the Army need to increase strategic communications to those populations deemed most desirable for entry into the Corps?’ ‘Do we need greater representation in the Corps from multiple engineering fields including not only civil, but also mechanical, electrical and environmental engineering?’ ‘Should the Corps target individuals in other Corps who have technical qualifications more readily to meet our future requirements?’

The Accessions work group analysed the methodology by which the Corps accumulated talent. The team were tasked to explore ways for the Corps to access enough personnel with technical qualifications.

The work group recognised that demand for construction trades within Australia is very high and this was expected to remain so for the foreseeable future. It was assessed that there are only approximately 350K 17-24 year olds available within Australia that meet the ADF’s entry requirements. They also identified it is very difficult for RAE to compete with industry due to the flexibility and remuneration available in the construction sector. This is an area in which we need wider Army support. There is a rigid (1970’s like) trade model that is applied to both access and remunerate RAE personnel. Certainly, the time taken to assess potential candidates is lengthy and often discourages willing candidates. The work group identified two issues that would enhance RAE’s access to talent.

The first was creating synergy between the various stakeholders such as the DFRT, technical regulation and assessment of trade qualifications, and a greater understanding of unit or task need. A simple method is required that accelerates recruitment / part-time construction trades / engineers. There needs to be options to realise extant SERCAT 5 vacancies in 2nd Division’s construction establishment and or grow the Part-time (SERCAT 3 and 5) workforce across Army (both 2nd Division and Full-time units). This may require the potential reset of establishments; noting the current dispersed nature of the capability across the establishment (less 6 ESR).

The second key issue was resources. It takes considerable effort to match individual skills with unit requirements and to fully leverage the potential available within the total workforce. Additional resources and effort are required for this task. Immediate Actions RAE could undertake included greater input into Army People Capability forums to assist in personnel policy development and to create synergy between the various bodies; promoting the Total Workforce Model to increase the talent pool; wider employment of FORCENET to advertise jobs for SERCAT 3/4/5; and either Army/RAE appointing a SERCAT 3 Coordinator for Construction Trades in order to provide the necessary focal point for the management of these skills.

In the midterm we need to ensure there is no disconnect with Defence Force recruiting for Civil Engineers and Tradespeople; we need a plan to surge trade training and expedite entry of partially qualified personnel into the system; we need to partner more with Industry to increase access to talent; and employ a more nuanced risk management approach that aligns the requirements of the task and the skills of the individual to the mission required. Partial qualifications may be useful on some tasks and would allow greater use of the Total Workforce Model; we just need to identify construction tasks early in 2020 and 2021 to tether these growth options towards both domestic and offshore tasks. This could look like Joint and Integrated Construction Engineer Task Elements built to service specific tasks (4-6 month durations).

Training and education work group

Group leader: Lieutenant Colonel Stimson CSC is currently working in Army headquarters as a staff officer in Director General Land. In 2020, he will be Commanding Officer of the 2nd Combat Engineer Regiment

‘Are we preparing people to be both technically and tactically proficient?’ ‘Are we validating what we are teaching and eliminating duplication?’ ‘Are we selecting the best capable instructors?’ ‘Are our instructional methods future focused?’ ‘Do we have the right infrastructure to ensure we are employing the best approach?’ ‘Is there a need to provide institutional financial support, additional time and pay incentives for seeking higher education or licensing within the field of engineering?’ ‘Could Industry and Professional Associations provide greater assistance?’

The RAE Training and Education work group focused on enabling the execution of the missions engineers perform by joint doctrine and in practice. They were to review educational systems of the other Services and Allied engineers. The group were to consider what training or education at what point in a career should occur for which personnel. Additionally, they were expected to identify methods-of-delivery to determine different ways to obtain the same knowledge or skill. This was to extend beyond Army institutional training to encompass industry experiences, self-development, civilian credentials and degrees. The work group were also to examine the current Corps education system, instructional methods and career educational timelines. The work group identified that our methods of training and education are successful for Engineers to be ready now IAW current direction. However, a more mature and agile training and education system is required to ensure the Corps is future ready. This requires focused efforts synchronised with whole of Army transformation led by DGTRADOC.

It was recognised there are limitations between Tactical Task Lists (TTL) and the training cycle. Acknowledging work already underway by 2 CER, it was recommended to extend this task to the full remit of engineer TTLs supported by 19 CE Works, 6 ESR and SOER. This would allow commanders to quantify capability ‘risk’ due to their inability to complete training (similar to the RAAC methodology—until they have

completed ‘Stage 6 gunnery’ (ATL 5), they cannot contribute to combined arms tasks). To better manage concurrency, risk, and resources, it was highlighted that we need to confirm the formalisation of specific TTLs or capability requirements to Engineer units resident in the part-time component of Army—both the Composite Engineer Squadron in the Reinforcing Battlegroup and 2nd Division Engineer Regiments.

It was also recognised there are currently 68 of 114 Learning Management Plans (LMPs) under review. Reviews can inform how training is delivered and that appropriate resources are allocated. We need to instigate a structured system and allocate formal tasks to complete the LMP reviews. We should promote the use of amendment requests through extant systems to inform future LMP changes. We must improve understanding on how extant courses may be delivered to accommodate available Army Reserve Training Salaries (ARTS) (via improved engagement between units and CATC).

Another aspect considered was doctrine. Doctrine is perceived as static and both time consuming and burdensome to change. We need to establish a system and/or schedule for review that is agile to the introduction into service of Engineer related capabilities. This requires significantly greater input from units, particularly where emerging capabilities require completely new concepts of employment (for example CBRND capabilities provided by L2110; the Manoeuvre Support Variant vehicle delivered under L400-3). We need to leverage the FORGEN cycle to enable doctrine to be updated in-line with lessons learnt from the ‘Readying’ RAE units (similar to the Brigade SOP review process). The team highlighted there is scope to apply alternative learning models to ensure training is efficient and effective. We need to investigate the application of suitability assessments to inform when individuals are ready to undertake specific training and education throughout their career (vice intuition). Investigate now how pre-course, self-paced learning and ‘accredited PME’ could be applied to reduce time spent on course and enhance learning.

RAE should identify whether mentors are appointed (both pre and post course) to ensure pre-course learning is appropriately facilitated, and post course retention of information and content is correctly applied. We should also investigate whether validation activities are required post course to ensure information is appropriately retained (including diagnostics or other activities). Trends may also inform further amendments to LMPs.

A further concept considered was understanding requirements for specialisation. The requirements for Engineers to specialise or remain broad warrants further investigation. The Corps should develop an agreed position on whether RAE personnel should specialise early and then broaden, or broaden early then specialise. This is particularly relevant as new capability enters Army. Could the RAAC specialisation model be applied to RAE? (i.e. RAAC SGTs are trained as Instructor Gunnery, Instructor Driving and Servicing, and/or Instructor Communications).

Similarly, can we identify which ADF and non-RAE Army projects or concepts could use RAE capabilities to facilitate trials and pilots (aka the simulation trial for plant operators). Another recommendation was that Army needs to generate flexibility within the Manual of Army Employment (including through specialisation and modularity). Could dedicated intensive training models be developed to build flexibility and enable 'just-in-time' training in support of targeted career progression (vice the linear career course progression model)? We also need to maximise Continuing Professional Development (CPD). The CPD model should inculcate and enable a culture of life-long learning.

Finally, Army and the Corps need to develop and inculcate a 'reach-back' system. We should maximise global interconnectedness, develop and build appropriate information portals, enhance connectivity with expertise, and enable / facilitate links to our coalition partners, commercial solutions and industry. SME should examine the appropriateness of 'The Cove' as a platform for a RAE specific portal, and/or a mechanism to consolidate video links to demonstrate key RAE capabilities, step-by-step user guides and/or processes. This should also identify options to create a RAE library or repository to manage, collate and organise data/information to support the retention, management and transfer of knowledge across generations, including lessons learnt.

Employment and retention work group

Group leader: Lieutenant Colonel Jamieson is the Commanding Officer of the 1st Combat Engineer Regiment. He has also had postings with Army Headquarters, 2nd Combat Engineer Regiment and the US Army Engineer School.

**'Do we need more technical positions?'
'Are there adequate career progressions?'
'Can Warrant Officers or SNCOs address some capability gaps?' 'Are their career road maps relevant for the future?' 'What are the current retention rates/trends for RAE personnel?' 'If there is high separation what do we need to do to improve those rates?' 'Do we need to improve the quality of life within the Corps i.e. increased pay for technical engineers, additional duty service obligation requests for enlisted postings of choice, increased engineer positions for young officers to use their technical degrees, and even greater flexibility between the Reserve and Regular Army?'**

The Employment & Retention work group considered whether there was a need to develop a new employment strategy that evaluates, segregates and employs individual talent. The team identified that Engineers are discharging or transferring at a time when Defence needs their skills, knowledge and/or experience. Army may also be managing and employing its Engineers with an inflexible mindset that fails to make the most of the skills, knowledge and experience available.

The work group considered the "loss" of a capability to be a lack of availability for operational employment, and so transition to SERCAT 3-5 was considered a success. RAE is unable to fill its current allocation of technical positions. In some areas this is due to unsustainability within the current rank structures. Reducing the skill requirements for some positions from Civil Engineer to Project Manager would help to alleviate some of the stressors on officer Civil Engineer numbers. Exploring options that focus on trade skill/qualification, rather than rank, could also provide greater work flexibility and alleviate Other Ranks trade sustainability issues.

The work group recognised that career progressions are adequate less for tradesmen. Because the senior works manager positions are filled to 100%, there is an actual

and perceived difficulty promoting from CPL through to WO1, and in some cases lengthy stagnation at rank. Trialling the posting of some WO1 works managers into officer Civil Engineer positions (with potential for transfer to officer stream pending suitability) was recommended to enable promotion of trade NCOs and the filling of officer technical positions. The team identified current retention rates were broadly workable; the exception was at CPL (for combat engineer, plant operator and all three vertical trades) and senior CAPT, where the Corps has been disproportionately understrengthened for some years. Trialling some innovative career management strategies might assist in retention.

Strategic communications work group

Group leader: Lieutenant Colonel Pembroke is the Commanding Officer of the 3rd Combat Engineer Regiment and is a chartered professional engineer. He has also had postings with Army Headquarters, 2nd Combat Engineer Regiment, Headquarters Joint Operations Command and as the Assistant Defence Attache in Port Moresby.

‘How could a formalised communications strategy assist in crafting specific messages for certain audiences that could be then delivered during routine engagements?’ ‘How could the Corps leverage on current initiatives underway by others including Corps of Royal Engineers, USACE or Industry?’ ‘How could social media, engineer websites, FORCENET, visits to schools etc. be better employed?’ ‘How could we revitalise our bonds of friendship with 5 EYES Engineers and form new relationships in the Indo-Pacific?’

The Strategic Communications work group were tasked to focus on developing an Engineer marketing plan and brand in coordination with Army. The team were directed to review how an all-informed Engineer net could be established ensuring RAE messaging is consistent, converging and aligned improving message ‘cut through’ and thereby better supporting Army. The team also considered how to get Vol V of the Corps History started, whether there was a need for another National RAE memorial and any opportunities for RAE personnel to participate in national and international engineering related competitions.

Multiple areas for improvement were identified but developing a current RAE Strategic Communications Plan and coordinated marketing plan linked to Team Army was the top priority. The current marketing and engagement across the Corps is disconnected; RAE units fail to portray supporting marketing messages. Websites/Social media need to be compatible, information needs to be similar and engineering messages should be consistent among all of these sources. The Corps Conference in 2017 developed a vision statement, however, this had not been communicated in any formal document. The vision statement was: “Military Engineers (Sappers) conduct the dangerous, dirty and demanding tasks that enable the joint force to live, move and fight.

As Sappers we understand the combat power generated by the integrated team is exponentially greater than the sum of its parts. Our people are uniquely skilled, tough and highly adaptive. We prepare robust teams, from the total engineer force that can integrate from Sapper to Regiment.” The vision statement was not well understood nor was it broadly socialised. When questioned, most people attending SAPPER 2019 were partially aware that it existed, however, could not say where it was written down or the specifics included in the message.

The work group recommended a new vision statement and a wider plan to influence strategic Corps advocates, and internal and external audiences. There was also a greater need for coherent messages and the following were suggested: 1) Follow the Sapper. There is broad support across the Corps for a message that recognises our heritage and lights the way to the future. 2) Once a Sapper, Always a Sapper. A message that reminds our veteran community they still belong. 3) Live, Move, Fight and Win. A message that articulates what we do to support the Joint Force.

The finding and recommendations in this article are not all inclusive of the work that was done by the SAPPER 2019 work groups. This advice post conference was presented to key parts of Army who in parallel are progressing efforts in support of ‘Building Great Engineers’. In 2020, the next Corps Conference will develop a Corps Campaign Plan that will become a foundation document for the next 5-10 years and prioritise and direct tasks to all members of the Corps. We will continue to use Australian Sapper; the Senior Engineer Leadership Forum; HOC Website and email to update the entire Corps on our progress.

Sappers' Fund subscribers

Head of Corps Treasurer - WO1 R Oltvanji

The Head of Corps would like to offer his thanks to the members below who have contributed to Sappers' Funds over the last 12 months to ensure that the RAE can continue to preserve, protect and develop our heritage while fostering our Esprit de Corps.

MAJGEN Crews, William James Retired
 BRIG Budd, Wayne Gregory ARES
 BRIG Carey, John Noel
 BRIG Casey, Brendan Shannon ARES
 BRIG Galton, Matthew Jeremy
 BRIG Hoskin, Rupert John Cardew
 BRIG Shanahan, John William
 COL Gliddon, Stephen John
 COL Maddalena, Russell John ARES
 COL Mostafa, Ahmad ARES
 COL Rouwhorst, Leonard Putu Hendrik
 COL Sanders, Robert Andrew †
 COL Scott, Michael Douglas
 LTCOL Bennett, Neil Arnold James
 LTCOL Brereton, Michael Leigh
 LTCOL Coates, Sharon Maree ARES
 LTCOL Davidson, Scott Francis D'Eresby
 LTCOL Elgey, Andrew Charles
 LTCOL Evans, David James
 LTCOL Everett, Simon Douglas
 LTCOL Fox, Douglas John
 LTCOL Gill, Benjamin Paul
 LTCOL Jamieson, Scott
 LTCOL Kavanagh, Adam James
 LTCOL Mostafa, Paul
 LTCOL McAuliffe, Mark Terrence ARES
 LTCOL McCormack, Michelle Anne ARES
 LTCOL McMurray, Roger James
 LTCOL Pollard, Jonathan David
 LTCOL Prior, Matthew John
 LTCOL Quinn, Matthew John
 LTCOL Ryan Orders
 LTCOL Sims, Peter Geoffrey
 LTCOL Stevens, Heath Carl
 LTCOL Stimson, Henry William
 LTCOL Tate, Justin Bruce
 LTCOL Venz, John Lloyd
 LTCOL Wright, Paul Frederick
 MAJ Basas, Arnel Jose V
 MAJ Buenen, Alexander Timothy

MAJ Carew-Reid, David Anthony
 MAJ Cooper, Philip Benjamin ARES
 MAJ Dalman, Leigh Michael
 MAJ Donaldson, Matthew Thomas
 MAJ Dreu, Mikaele Sikivivico
 MAJ Fernandez, Bayani
 MAJ Gains, Tommy
 MAJ Graham, John Calum ARES
 MAJ Gray, Brendan John
 MAJ Hales, Graham Joseph
 MAJ Hamilton, Kevin Ashley
 MAJ Hanigan, Damian John
 MAJ Hansch, Erica Jayne
 MAJ Hansell, Andrew Michael
 MAJ Hill, Adam Joshua
 MAJ MacDougall, Ian Phillip
 MAJ Meany, Arlo Dale
 MAJ Mendon, Gerry ARES
 MAJ Murray, Christopher Robert
 MAJ Owen, Rhys Andrew
 MAJ Pinkerton, Remy Kym
 MAJ Plimmer, Jack Brendan ARES
 MAJ Porter, Joshua Stephen ARES
 MAJ Poyner, Jessica Henriette
 MAJ Rai, Bhala Bahadur
 MAJ Riddle, Clive Andrew Craufurd
 MAJ Silvestri, Michele
 MAJ Sterling, Briana Chole
 MAJ Theisinger, Braden Wayne
 MAJ Tharmarajah, Seralaadan
 CAPT Bell, Joel Michael
 CAPT Ferwerda, David Nicholas
 CAPT Harper, William Zeath
 CAPT Hunter, Megan Lea ARES
 CAPT Miles, William Oliver
 CAPT Murphy, Timothy Mitchell
 CAPT Scott, Matthew Peter
 CAPT Williams, Isaac Duncan
 CAPT Witcomb, Peter James
 LT Budd, Thomas Michael

WO1 Bridges, Glenn Norman
 WO1 Chainey, Sean William
 WO1 Dickson, Matthew Phillip
 WO1 Di Tullio, Steven John
 WO1 Goodbody, Shawn Glenn
 WO1 Grigg, Mark Christopher RSM
 WO1 Grope, David John
 WO1 Jones, Justin David
 WO1 McAlinden, Sean Patrick
 WO1 Nagle, Graeme Austin ARES
 WO1 Oltvanji, Robert
 WO1 Peel, Russell David
 WO1 Woolfe, Damien Alexander
 WO2 Anderson, Craig Andrew
 WO2 Burgess, Lesley Darrin
 WO2 Dolan, Robert John
 WO2 Hedges, Daniel Francis
 WO2 Logue, Richard Daniel
 WO2 Pitt, Andrew William Seymour
 WO2 Thorne, Daniel Guy
 WO2 Waddell, Gregory Alan
 SGT Capare, Victor John ARES
 SGT Farmer, Timothy John
 SGT Johnstone, Robert James
 SGT King, Namron Clinton Edward
 SGT Managrave, Philip Pene
 SGT Wood, John Leonard
 CPL Channing, Jonathan Michael
 CPL French, Alexander William
 CPL Rowell, Alan Barry
 LCPL Gipson, Mark Phillip
 SPR Allisey, Robert Henry
 SPR Hancock, Jason Siroy
 SPR Hendy, Mitchell Tyler
 SPR Hughes, Ryan Leigh
 SPR Kesby, Timothy Ross
 SPR Mahains, Bonnar Jack ARES
 SPR Purcell, Andrew Troy ARES
 SPR Wagner, Bailey Nicholas

Sappers in paradise

Captain Jack Lush



It has been exciting times since I first landed in Papua New Guinea for my stint as the Works Officer, embedded into the PNGDF Engineer Battalion in Lae. With a newly created SGT Training Advisor position, filled by SGT Ryan Bellis, the year ahead would be diverse, unique and challenging.

The first month disappeared in what felt like a second, the adaption to new people, climate, languages, equipment, processes and most importantly culture, took us by surprise as we attempted to retain as much information as came in.

Over the year, we've had Mentor & Training Teams (MTT) deploy to Lae to assist with individual and collective training. The first, led by LT Pope from 3 CER. His team delivered some excellent combat engineering training for Bravo Company. This then helped pick the PNG section to travel to 3 CER and take part in Dingo Fury, which unfortunately due to the floods, was scaled down. The second was led by LT Connell, also from 3 CER, with the purpose of delivering the Demolitions Supervisor course for the first time since

1999. Also highly commendable, was the charity of the 2nd MTT, as many donated their runners to the local community, as well as the profits from the chit fridge.

The addition of SGT Bellis to the team has provided extraordinary horsepower to the Engineer Bn's training cell. SGT Bellis' efforts throughout 2019, in raising a CPL Qualifying Course (the PNGDF CPL Sub 1 equivalent), Demolitions Supervisor, Engineer ROBC and an externally contracted Driver Grade 1 course (G-Wagon Equivalent) have directly enhanced the Battalion's capability and has assisted in catching up the promotional course lag that has grown over the last decade. We hope to continue this into 2020 with getting all NCO's qualified to rank and maybe even qualifying some new Plant Operators.

The constant requirement for infrastructure in PNG is well known by all Sappers, and the works completed by the Defence Cooperation Program (DCP) this year have been substantial, with the Taurama Barracks OR's mess reaching completion in September being the major project. However, WO2 Matthew 'Chika' Tritton has been working tirelessly, as the Works WO, across the entirety of PNG to ensure the maintenance and saving the ageing structures before it's too late. For anyone who knows Chika; he doesn't leave anything on the park, and his efforts in 2019 stay true to form.

The last of the Sappers in PNG is at Goldie River Training Depot as the WO Field Engineer Instructor. This is filled by WO2 Greg Wright and he has been instrumental in the running of Engineer IET course and as an instructor on ROBC who has taken particular delight to shape the future PNGDF officers.

As the Engineer Bn is responsible for the Baiyer Madang Road Project, i.e. cutting a track through mountainous virgin jungle, the experience of managing projects was identified as a shortfall in the NCO and Junior Officer training. Luckily, this gap was able to be closed by 6 ESR and AACAP. In a change away from the norm, only a team of four PNGDF Sappers, over two rotations, were deployed to Jigalong. It was here they learnt the critical basics of project management in the red dust, before applying it to the brown mud in PNG.

Exercise Puk Puk is the largest exercise undertaken by the Engineer Battalion and in 2019 it was held at the Battalion's home in Lae. The 3 CER contingent, led by MAJ Chris Kukas – OC 25 SPT Sqn, were the first to deploy with the new Land 121 vehicles and by all reports handled the disastrous roads with ease. However, it was the first time in Ex Puk Puk's history that there was a scope item



CAPT Lush playing for the Igam Barracks Crocs in the annual sevens competition.





Above: CAPT Lush representing PNGDF at the International Defence Rugby Competition in Tokyo, Japan

led completely by the PNGDF; 2LT Russell Wani was the Project Engineer after his return from AACAP and consolidated the skills learnt with LCPL Mokalebida 'Mocha' Tovaboda achieving tremendous respect from all through his exceptional work as site foreman.

In keeping with the traditions that sport holds in any Defence Force, the PNGDF held their bi-annual Commander's Cup Rugby Sevens competition in July, where I was lucky enough to play for the Igam Barracks Crocs. On the rock-hard deck of Murray Barracks oval, we managed to make it all the way through to the final, with a drop-goal attempt after the siren being smothered ruining our fairy tale.

In the gig of the century, I was selected to represent the PNGDF at the International Defence Rugby Competition in Tokyo, Japan – the first Australian Defence personnel to do so. Being the largest on the team, I was naturally given the number 8 jersey but looked tiny compared to some other nation's specimens. Unfortunately, the story for PNG was that you can't beat physics, as the other teams towered over us and had pack weights well over 900kg, we gave our best but couldn't hold the opposition at bay. We ended up losing all our matches, to France 71-0, Georgia 33-7 and South Korea 69-28, gaining the wooden spoon. However, the experience had by all was one of a lifetime and the mateship formed will endure for many years to come.

In all seriousness, PNG generally gets a very bad wrap in the induction briefs, and as a result I have seen many people – myself initially as well – arrive in this fantastic country highly reserved and unwilling to put themselves out there. I, and the other three Sappers posted here, can all attest to this country and once you're able to escape your own perceptions, then the place only gets better. If you're looking for a diverse, unique, interesting and challenging role then I can not promote these postings enough. There are several young families here and children are the perfect way to get your foot in the door to the local community and it is an absolutely lovely place for them to grow and develop.

With all the Australian Sappers in their first year, it has been thoroughly amazing to see what the Papua New Guineans can do with so little, their ingenuity at times frustrating, but still able to achieve what us Australian's would generally be unwilling and deem impossible. All four of us have learnt of the amazing culture and generosity of this country's people in our newfound home and are somewhat dreading the return. With the Engineer Battalion looking to 2020 as a year to build on the foundations made this year, it will be an exciting time in Lae.



BQ5934064

**ROYAL AUSTRALIAN ENGINEERS
ORDER OF THE DAY**

**ON THE OCCASION OF THE 70th ANNIVERSARY OF
17th CONSTRUCTION SQUADRON**

20th September 2019

To the Sappers of 17th Construction Squadron, both past and present:

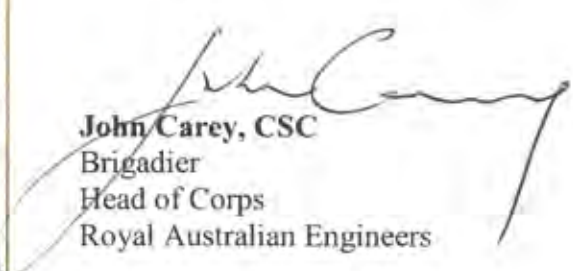
Today, marks 70 years serving our Nation. Your accomplishments both at home and abroad have been exceptional. You have taken in stride military tasks so difficult as to be classed by many doubters as impossible.

You have led with honour and great courage in Vietnam, Namibia, East Timor and Afghanistan, often in the face of the enemy. Your service in Vietnam during the period 1966 to 1971 forms a considerable part of our RAE history and has created strong legacy for modern day Sappers. Indeed, your extraordinary efforts in Namibia led to the awarding of an Honour Distinction for outstanding service in operations in other than declared theatres of war.

The world admires your determined efforts building infrastructure in the South West Pacific, your incredible strength and fortitude as part of the Army Aboriginal Community Assistance Programme, and your goodwill and compassion when assisting the wider Australian community following natural disasters. You continue to endure every discomfort and hardship and impressed all with how you have overcome every obstacle thrown in your way.

Your remarkable history has helped forge the ANZAC identity. Your willpower, perseverance and strength to see the mission through to completion, while taking great care of your People, has been ultimately inspirational. Your future is bright as part of the 6th Engineer Support Regiment and I look forward to your continued success in the enabling of the Joint Force.

At any time and in any place, 'A little bear will fix it.'


John Carey, CSC
Brigadier
Head of Corps
Royal Australian Engineers

20 September 2019



BQ6227670

**ROYAL AUSTRALIAN ENGINEERS
ORDER OF THE DAY**

**ON THE OCCASION OF THE 80th ANNIVERSARY OF THE
SCHOOL OF MILITARY ENGINEERING**

26th September 2019

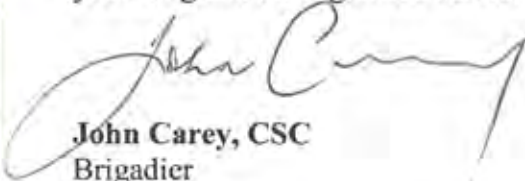
To all Sappers of the School of Military Engineering, both past and present:

The School of Military Engineering can be traced back to colonial times when founded at Victoria Barracks, Sydney. It was established on a permanent basis on the 26th September 1939 in the Liverpool District. Throughout its history, it has prepared those who join the Royal Australian Engineers for their many and varied roles across the world; ensuring that they receive the very best instruction.

Today, marks 80 years since 'SME' was inaugurated to serve the Nation – a significant milestone in the history of our Corps. As the 'Home of the Sapper' and the ADF Engineer Centre of Excellence, your commitment and professionalism have easily impressed and left a lasting legacy. Your efforts during WWII, Korea and Vietnam were outstanding. You were at the forefront of innovation in support of operations in Iraq and Afghanistan. You continue even now to deliver our full suite of Engineer initial, promotion and specialist courses for all three Services and Allied partners for the challenges of multi-domain warfare, while at the same time enriching training, supporting our modernisation efforts and introducing new concepts and equipment.

I remember early in my career a young sergeant instructor with rows of medals and qualified in bomb disposal, mine warfare and combat diving telling us that the only reason we existed was to fight and fight well and protect this country. He went on to say if, 'you can't do small things perfectly, you can't do the big things even half-way good enough.' So today and yesterday, thank you to our instructors and training leaders for being committed to excellence. Your ability to prepare and train Sappers, quickly, safely and without fuss, for the purposes of warfighting, peace building or disaster relief has been remarkable – and inspirational.

You and your families have risen to every challenge; I congratulate you on reaching this point in your long and distinguished service.


John Carey, CSC
Brigadier
Head of Corps
Royal Australian Engineers

26th September 2019



**ROYAL AUSTRALIAN ENGINEERS
ORDER OF THE DAY**

**ON THE OCCASION OF THE ANNOUNCEMENT OF THE
2019 ROYAL AUSTRALIAN ENGINEERS AWARDS**

09th November 2019

To all Sappers past and present, it gives me great pleasure to announce the recipients of the Royal Australian Engineers Awards for 2019. These awards acknowledge in an appropriate manner, outside the existing Honours and Awards scheme, the achievements and enduring service of Sappers.

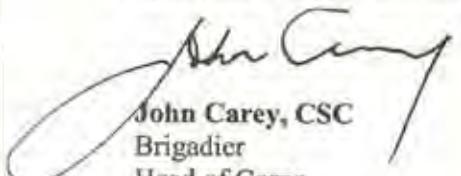
RAE Excellence in Engineering Awards:

- Lieutenant General FJ Hickling AO, CSC Award for *Most Outstanding Engineer*, **Corporal M Sullivan (3 CER)**
- Major General S Day DSC, AM Award for *Most Outstanding Lieutenant ARA*, **Lieutenant TS Gallagher (2 CER)**
- Warrant Officer Class Two RC 'Mick' Mace MM, BEM Award for *Most Outstanding Non-Commissioned Officer ARA*, **Corporal M Sullivan (3 CER)**
- Warrant Officer Class One B Wade OAM, CDS Award for *Most Outstanding Sapper ARA*, **Sapper R Stevens (6 ESR)**
- Colonel AH 'Sandy' McGregor MC Award for *Most Outstanding Lieutenant ARes*, **Lieutenant TM Braes (3 Fd Sqn)**
- Warrant Officer Class One R 'John' Raddatz OAM Award for *Most Outstanding Non-Commissioned Officer ARes*, **Corporal L Jackson 3 Fd Sqn**
- Sergeant M Chalk MG Award for *Most Outstanding Sapper ARes*, **Sapper A Gray (22 ER)**

The Brigadier General CH Foott CB, CMG Award:

Award for an individual who has rendered outstanding and significant support or service to the Corps of Royal Australian Engineers, Colonel J Wertheimer (Retd)

I congratulate all recipients on the dedicated application and determination of service which has earned you high regard from your superiors and peers. Your efforts bring great credit upon yourself, your unit and the Corps.


John Carey, CSC
Brigadier
Head of Corps
Royal Australian Engineers

9th November 2019

BQ7513421



**ROYAL AUSTRALIAN ENGINEERS
ORDER OF THE DAY**

**ON THE OCCASION OF THE ANNOUNCEMENT OF THE
2019 ROYAL AUSTRALIAN ENGINEERS SPORTS AWARDS**

09th November 2019

To all Sappers past and present, it gives me great pleasure to announce the recipients of the Royal Australian Engineers Sports Awards for 2019. These awards recognise excellence in sport within the Corps and seek to encourage sporting participation.

RAE Sports Awards:

- RAE Sports Person of the Year – **SPR R Morris (1 CER)**
- Rising Star Award – **SPR G Hauck (2 CER)**
- RAE Coach of the Year – **SPR M Beddie (2 CER)**
- RAE Official of the Year – **WO2 B Prowse (1 CER)**
- Contribution to Corps Sports – **MAJ S Reid (3 CER)**

I congratulate all recipients on their sporting endeavours and success in 2019. Your efforts bring great credit upon yourself, your unit and the Corps. The principles of sport, promote an enduring culture of optimal performance: as individuals, as teams and as an Army. To all Sappers of the Corps, I encourage your participation in unit and individual sport in 2020, whether as a participant, an official or support staff.

John Carey, CSC
Brigadier
Head of Corps
Royal Australian Engineers

John Carey
November 2019

BQ7582225



**ROYAL AUSTRALIAN ENGINEERS
ORDER OF THE DAY**

**ON THE OCCASION OF THE ANNOUNCEMENT OF THE
2019 ROYAL AUSTRALIAN ENGINEERS STEELE CUP
COMPETITION**

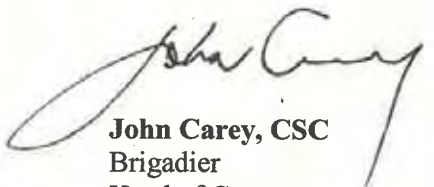
09th November 2019

To all Sappers past and present, it gives me great pleasure to announce the winners of the Steele Cup for 2019. The RAE Best Sapper Competition was established in 2011 to recognise achievement, team work, military engineering and soldier skills. The purpose of the competition is to promote esprit de corps within the RAE and create a healthy competition between Engineer Units.

The Steele Cup is a twenty four hour competition whereby teams of pairs, between the ranks of Sapper and Corporal will be challenged across a broad range of activities both in the field and within barracks. This year's competition was conducted by:

- LCPL M and SPR N (SOER)
- LCPL Carpenter and SPR Meyer (3 Fd Sqn)
- LCPL Moss and SPR McFaden (1 CER)
- LCPL Bradford and SPR Boyd (2 CER)
- CPL Donnelly and LCPL Adams (3 CER)
- SPR Franks and SPR Thorburn (6 ESR)
- CPL Totten and CPL Henry (SME)

Congratulations to LCPL M and SPR N (SOER) on winning the 2019 Steele Cup and to all participants on the character they displayed during its conduct. I also congratulate the School of Military Engineering and the 2nd Combat Engineer Regiment for providing an excellent activity. As professional soldiers, the value of sustained physical and mental endurance activities is an indispensable component in building military capability and personal resilience. We must never forget why it is we exist and the standards of readiness we must maintain to serve our Nation when called to do so.


John Carey, CSC
Brigadier
Head of Corps
Royal Australian Engineers

9th November 2019

BQ7582277

The RAE Collection and Museum

MAJ Craig Clunas

The Engineers' museum continues to evolve with recent acquisitions, new exhibitions and staff changeovers occurring throughout 2019. In January the museum welcomed the new curator, Ms Leah Herdman, and WO2 David Moss, who joined us from 5 CSSB.

In April the Australian Army Museum of Military Engineering achieved its first exhibition changeover since its opening in 2015. The new display is located in the First World War section of the galleries. The display highlights the 1st Field Company through the story of Sapper John Hoey Moore. Sapper Moore, nicknamed Anzac Jack, was a member of the 1st Field Company that landed at Gallipoli, and later the 14th Field Company on the Western Front. The display features a selection of his letters, battlefield relics and personal effects, including the camera that he smuggled onto the front lines, which is engraved with the places he saw over the course of the War. The museum is looking forward to producing more new exhibitions in the future, with the items already in our collection and the donations we continue to receive.

In July, the museum was involved in a ceremony to honour Lieutenant John Appleby, a member of the 2/6th Field Company during the Second World War. Lieutenant Appleby's story is remarkable and one that few are aware of, until now.

The Company was in Batavia (present day Jakarta) in 1942, aiding the Netherlands East Indies forces in the defence of aerodromes and oil supplies, when Appleby was taken by the Imperial Japanese as a prisoner of war. Soon after, Appleby and Anglo/Dutch interpreter Tom Powell escaped and sought help from Powell's fiancé, Hannah Christi Hilgers. Aided in their concealment by Hilgers, the pair joined the Dutch Resistance, operating a radio receiver for information to pass onto Allied forces and producing several false Japanese documents. Even under the threat of detection and execution by the Japanese military police, known as the Kempeitai, the pair were determined to continue their diligent work for the resistance.

Appleby and Powell were being concealed in Buitenzorg at the home of Mr P.M. Mulder, along with Sergeant Bechtholt, another member of the resistance, when they were betrayed by Japanese

sympathisers and caught in a raid by the Kempeitai. Rather than be taken, the group attempted to kill themselves and the Kempeitai with grenades, but the devices failed to detonate. Appleby, Powell, Bechtholt

LT Appleby and his posthumous Ribbon of the Australian Commendation for Gallantry and the Dutch Resistance Memorial Cross





Above: Head of Corps, BRIG Carey, accepts the Netherlands Resistance Memorial Cross posthumously awarded to LT Appleby from Defence Attaché for the Kingdom of the Netherlands LTCOL Mermans.

Below: The soldiers John Appleby and Wilhelmus Bechtholt side-by-side at Ereveld Ancol

and Hilgers were found guilty of conspiring to harm Nippon power; spying and resisting arrest, and were sentenced to death. Their remains were recovered from Batoe Toelis after the conclusion of the War and were re-buried in the Netherland Field of Honour cemetery at Ancol with full Military Honours.

Lieutenant Appleby was posthumously awarded the Resistance Memorial Cross by the Netherlands in 1980, but the award was never claimed. Mr Peter Scott uncovered the story whilst researching his father's

service with the 2/6th Field Company. He attempted to find a next of kin to claim the award, but was unsuccessful. In 2018 Mr Scott received notification from the Dutch Embassy that they would present the award to a representative of the Corps. On 5th July, the Head of Corps, Brigadier John Carey CSC, accepted the award on behalf of the Corps from the Netherlands Defence Attaché, Lieutenant Colonel Elmar Hermans [See photograph]. The medal will henceforth be held at the Engineers Museum, to be displayed in an exhibition on the 2/6th Field Company in the near future.

The continued support of the museum from the Corps is important. If anyone has objects photographs or documents that they wish to donate to the Corps collection or a topic that requires research support, please contact the museum at aamme.mailbox@defence.gov.au. We can only tell the Corps' story with your support.



RAE Corps Shop Price List

The Corps Shop has a comprehensive range of goods, at competitive prices, that can be ordered by telephone or email sent-on by post.

Books	Price
RAE Corps History Vol 1 - 4	\$40.00
RAE Corps History Slip Cover	\$20.00

Clothing	Price
RAE Under T-shirt Brown	\$22.00
RAE Under T-shirt Olive Green Blen	\$22.00
RAE Long Sleeve Business Shirt	\$25.00
RAE Badged Baseball Cap	\$20.00
RAE Fleecy Sweater	\$25.00
RAE Sports Shorts - Black	\$25.00
RAE Tie	\$15.00
RAE Hoody	\$40.00

Figurines	Price
Figurine Afghanistan Patrol	\$140.00
Figurine Digger OP Anode	\$140.00
Figurine EOD Bomb Tech	\$140.00
Figurine Military Working Dog	\$140.00
Figurine Searcher Afghanistan	\$140.00
Statuette - Timor Bailey bridge	\$30.00
Silver Sapper	\$117.00

Item Description	Price
Afghanistan Drink Cooler	\$7.50
RAE Cuff Links	\$11.00
Dingo Plush Toy	\$10.00
Dog Sarbi EDD - Plush Toy	\$15.00
Dog Small EDD - Plush Toy	\$10.00
Drink Cooler - Purple Poppy	\$7.50
East Timor Peacekeeper Badge	\$5.00
Leatherman OHT-Coyote Tan	\$115.00
Leatherman OHT Molle Brown	\$115.00
Leatherman Wave	\$125.00
Leatherman Crater C33LX Knife-with Follow the Sapper engraved	\$40.00
RAE Travel Mug	\$15.00
RAE Sipper Bottle	\$15.00
Patch Shoulder Non-issue Build a Bridge and get over it	\$10.00
RAE Badge Car Bumper Metal	\$33.00
RAE Badge Embroidered	\$22.00
RAE Belt Buckel	\$35.00
RAE Decanter	\$54.00
RAE Follow the Sapper Mug	\$10.00
RAE Hat Badge	\$15.00
RAE Hip Flask	\$45.00
RAE Key ring Gold	\$10.00
RAE Lapel Pin	\$7.50
RAE Medallion with Stand	\$25.00
RAE Pewter Mug	\$80.00
RAE Tie clip	\$7.50
Slotch Hat Box Black Plastic	\$95.00
Boston Crystal 3 Piece Whiskey Set	\$185.00
RAE Pannikin Mug	\$7.00
RAE Challenge Coin in Plastic Pouch	\$12.00
RAE Challenge Coin in Velvet Box	\$18.00
Bear Jack Ops	\$20.00
Peacekeeper Bear	\$25.00

Contact details:

Telephone: 02 878 28830

Email: aamme.mailbox@defence.gov.au

Trading Hours: Tue - Fri, 0900 - 1500

EFTPOS , Visa and Mastercard are accepted



Army