Australian

sapper

2018

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Cover: A member from A Squadron Special Operations Engineer Regiment conducts sampling of a suspected hazardous chemical agent.

Message from the Head of Corps Royal Australian Engineers

BRIG David Wainwright DSC

Fellow Sappers past and present, as Head of Corps I feel honoured to introduce this 2018 edition of the "Sapper Magazine" and provide some introductory remarks. Naturally this edition captures yet another notable chapter of the remarkable character of our Corps and the value that our Sappers provide our Army, our Defence Force and indeed our Nation. It incorporates a snap shot of the adventures of our units, both at home and abroad, the efforts by our associations; and it includes the multitude of milestones and outstanding service that has again successfully defined what it means to be a Sapper in the Australian Army. In each case I would offer that these collective efforts again reinforce the strong and established tradition of our Corps. The achievements reflected on each page of this 2018 edition are again exemplary and I extend my thanks on your behalf to all involved in preparing this year's edition. You have collectively added yet again to the richness of our people and our continued strong heritage; and this is something that we all should be truly proud of. In particular I seek to applaud the 'people' stories contained in this edition that arguably underpin the very capability we bring to both Army and the Joint Team in serving our Nation – An Army in Motion.

Firstly, as 2018 draws to a close, I wish to formally acknowledge and thank our departing COs and RSMs for your service; LTCOL Barry Mulligan CO 1 CER, LTCOL Jen Harris CO 3 CER, LTCOL Nicholas Bosio CO 6 ESR, LTCOL Dave Long CO SOER, LTCOL Glen Billington 19 CE Wks, WO1 Steve Di Tullio Corps RSM, WO1 Sean Chainey RSM 2 CER and WO1 Robert Clarke 11 ER.

RAE Vision

Sappers conduct the dangerous, dirty, and demanding tasks that enable the Joint Force to live, move and fight.

Our people form uniquely skilled, adaptive and prepared teams drawn from the Total Force.

Investment in our people, equipment and emerging technology will enhance the Joint Force in a congested and contested future operating environment.

We all know the significance that each and every one of the above key leaders has invested in their roles. On behalf of the Corps – our heartfelt thanks. We trust you and your families will enjoy a well-deserved break and all the very best for your next adventures moving forward in 2019. You have been exemplary leaders.

I would like to explicitly express my personal thanks to the outgoing DHOC RES – COL Brendan Casey, the Corps RSM – WO1 Steve Di Tullio; and key orchestrator of our HOC efforts these past years - SO2 HOC MAJ Clive (Jim) Riddle. Our sincere thanks for the leadership and dedication you all have provided in your roles to the Corps – You have been remarkable ambassadors.

It would be remiss of me if I did not highlight the extremely distinguished event in May this year that recognised 1st Field Squadron and our Corps. On behalf of all Sappers, we offer our heartfelt thanks to George who was the vanguard from the association that ensured the long awaited moment for our Corps when the Chief of Army pinned the Unit Citation for Gallantry streamer onto our Corps Banner. The Unit Citation for Gallantry honours the efforts of Sappers with their combined arms mates in Vietnam at the Battles of Fire Support Bases Coral and Balmoral. – Our congratulations to all.

On 01 July 2018 we witnessed the transition of Geospatial and Multi Media Engineers to the Intelligence Corps. I commend the spirit that characterised this transition by all involved and I would like to take the opportunity to thank all those members who have taken up the offer to transfer for the support that you have provide to the RAE and to wish them all the best for the future careers.

In July I wrote to the wider Sapper leadership seeking assistance for a good friend of the RAE and the

1 Fd Sqn Unit Citation parade in Canberra for Gallantry for services at the Battles of Fire Support Base Coral and Balmoral 12 May to 06 June 1968

Australian Army, Abdul Mateen 'Yusof' Yusofzai. He had successful immigrated to Australia these past years post the multitude of rotations he supported in Afghanistan both as an interpreter and later as a draftsman. I sent a short request for advice or assistance to the wider Sapper community seeking help for Yusof and his young family while he completed his Civil Engineering degree in Adelaide. Unsurprisingly the collective responses were nothing short of phenomenal, with my original request propagating quickly around the country on 'Sapper Net'. I am pleased to inform you that Yusof started some week's later working with Aurecon as an Undergraduate Project Manager/Engineer to compliment his studies. I thank the team at Aurecon for taking him under their wing and the multitude of companies and individuals that equally offered him employment, placements, and other support. From a HOC perspective I was incredibly proud to see first hand how the Sapper community pulled together at short notice to help a friend who served side by side with us. It was extremely humbling for our Sapper community to collectively support this young man and his family as they embrace a new life in Australia. This speaks volumes about your character – my sincere thanks.

In the coming months I will transition from the Regular Army from what has been a tremendously privileged career and handover the role of HOC to BRIG John Carey, CSC. BRIG John Carey is a good friend and I know I leave the Corps in great hands. It has been a distinct honour to serve for the past 30 plus years and I draw great comfort from the engagement I have enjoyed with the talent and tremendous leadership we enjoy in our Corps. On reflection, I believe that this may be something that we collectively perhaps may at times take for granted. Hopefully this years Sapper Magazine serves as a useful reminder of the talent of our people, supported by great leaders at every level. We should not be afraid to tell our story and why we so passionately pride ourselves on being a Sapper. From the can-do culture, the willingness to bravely go forward and tackle the uncertain with confidence; through to the ingenuity of our solders or perhaps more eloquently expressed no better then the 'sappernuity' of our people. This edition again reinforces to us all why we should never lose sight of the centrality of the sapper, reflect on our proud heritage, acknowledge the achievements of today and continue to invest in our future. This is because Sappers have always been at the forefront of our Army, leading the way – A trait that will always endure.

Enjoy this year's 2018 Sapper magazine. My thanks for your service and my sincere best for the future.

Ubique

Message from the Corps Regimental Sergeant Major Royal Australian Engineers

WO1 Steven Di Tullio OAM

With the end of the year nigh, my tenure as the Corps Regimental Sergeant Major (RSM) comes to a close. In 2019 Warrant Officer Class One Sean Chainey will take up the position as your Corps RSM, congratulations to Sean on his appointment and tier advancement as a WO1.

My time as the Corps RSM has seen me involved in providing advice in the process of some significant changes to the Corps, some of these are still to be realised but they are coming; some old that are new again – common training in the construction trade continuum, EOD trade rolling back into the 096 trade model, under armour breaching capability, armoured vehicles as part of the Engineer Regiments just to name a few. The Corps continues to grow as it always has.

In June, the Corps transferred the Geospatial and Multi-Media Technicians trades when they transferred over to the Intelligence Corps. To all the members of those trades past and present, I thank you for your service to the Corps and wish you all the best in the future.

I have seen a fantastic cooperation and dialogue between the commanding officers (CO) of all the engineer units making sure that with Plan Keogh's implementation, the regiments are aligned and importantly we have one voice and one message moving forward, I hope this continues into the future.

In May, I had the privilege to attend the 50th anniversary parade of the Battle of Coral and Balmoral, the significance of this parade is that the members of the 1st Field Squadron who fought, survived and died on the battle field in Vietnam, 50 years ago, were recognised as a unit and presented with a Unit Citation for Gallantry. There has been significant work in the background by George Hulse who the Corps and members of the 1st Field Squadron can be grateful for, that this recognition has finally come to fruition.

The past two years has seen members of the Corps be recognised by the Chief of Army (CA) and recently in the Forces Command awards. In late 2017 CPL John Kuttner (SME) was recognised with the CA Award for Instructional Excellence and this year in

the Force Command Soldier of the Year awards LCPL John Limbert (6 ESR) was named 'Soldier of the Year and Sapper Jaryd Dickson (22 ER) placed third in the category. Congratulations to you all on well-deserved recognition for you service.

To all the members of the Corps who have separated this year, I thank you for your service. I hope you have enjoyed your time in the Corps and found satisfaction with your service. I hope you remain in touch with the Corps via an association in your area or by visiting the unit now and again and reminiscing of your time serving.

My last big hurrah was to march out onto Bigge Park, Liverpool as the Corps RSM to commence the ceremonial aspects as the Corps exercised the Freedom of Entry to the City of Liverpool. Originally granted on 5 September 1959, the Corps will be presented a new scroll, after the original was burnt in a fire of the Council Chambers in 2011. It will be a memorable occasion for myself and an excellent way to sign off as the Corps RSM.

As my time as the Corps RSM draws to a close I wish you all the best for the future, continue to do those dangerous, demanding and dirty jobs to the best of your ability. Be the best at your Corps job, then your combat roles and lastly the other stuff (corporate governance etc) - that keeps our workplace ticking and safe and our equipment serviceable.

Good sappering

The Royal Australian Engineers Foundation ‘For Sappers, By Sappers’

COL Tara Bucknall

The Royal Australian Engineers Foundation continues its work to support the Australian Sapper community and to help preserve our military engineering heritage. The Foundation serves to supplement (not replace) the support offered to all Sappers by the Corps Fund. As a registered charity, the Foundation has flexibility to support activities and make financial contributions that Corps Funds and other agencies, such as Veteran’s Affairs, cannot. Consequently, the Foundation can service an important niche in the wider suite of support options available to our military engineering community.

In short, the Foundation is here to ‘put back’ into the Corps where it can. Board members have all served in the RAE, and seek to identify opportunities for the Foundation to fulfil its main roles of philanthropic support, professional development support and heritage preservation for the RAE.

The Foundation is a non-for-profit organisation that depends on fundraising to maintain its services to the Corps. Donations to the Foundation are tax-deductable and all monies raised go towards supporting those who serve in the RAE. For information on what the Foundation does and how you can make a contribution or become involved, visit the Foundation’s website at: www.raefoundation.org.au

Force Engineer Branch

LTCOL Matt Prior

Introduction

2018 was an emotional year for the Force Engineer Branch (FEB) as it prepares for disestablishment in December 2018. Despite diminishing numbers due to reassignment and deployment, FEB's focus remained providing support and advocacy for RAE capabilities. As the year progressed, focus shifted more towards ensuring that the FEB's roles and tasks are effectively transitioned in order to ensure this support continues via new means.

Disestablishment

FEB's disestablishment had its origins in Army's 2017 drive to reduce establishment hollowness and align the workforce within salary resources. While a spirited rearguard was established by the Corps, Army's decision to use FEB positions to offset other capabilities was confirmed in early 2018, with transition planning subsequently commencing. Most of FEB's tasks will be absorbed across HQ FORCOMD, and the task reallocation plan was endorsed in September 2018. Those tasks not remaining within HQ FORCOMD will generally go to AHQ (SO1 Engr Systems) or HQ 6 CS Bde, who will mainly take on AACAP-related roles. Three FEB positions were 'saved':

- SO2 FORGEN transfers into G4 Branch, HQ FORCOMD in an infrastructure support role
- SO3 Training transfers into HQ 6 CS Bde as an additional Ops CAPT (likely to support AACAP)
- WO1 AER transfers to AHQ (Combat Support program) to ensure that the trade is represented for capability development considerations.

AACAP

Noting that delivery of AACAP is driven by 19 CE Wks and 6 ESR, FEB's role was to provide the strategic lead for AACAP planning and external engagement, before handing off to executor units. AACAP continues to be an important training exercise for Army's deployable engineering capability whilst making important contributions to the quality of life in remote Indigenous communities. Now in its 22nd year, AACAP is currently funded out to financial year 2021/22.

Technical Trade Review

FEB has investigated the issue of technical engineering skills degradation. Technical engineering skills are a blend of formal education (a civil engineering degree) and experience in the practical application of that degree in a military context. Like any learned ability, technical engineering skills (such as design) will degrade if not practiced or refreshed over time.

The review covered RAE's construction capability history, likely future technical tasks and consulted members across the Corps on their thoughts. While there is still some contention as to the exact technical engineering skills our construction capability requires, points of note included: looking at potential changes to professional engineer education and training; understanding what skills Army needs from its engineers; leveraging the experiences from past, current and future deployments to shape the capability; and examining formal professionalisation programs for application to military engineering. FEB continues to work toward solutions and engage with stakeholders best placed to instigate change in 2019 and beyond, with likely task handover to 19 CE Wks.

Explosive Ordnance/ Hazard Training Review.

Current-to-future requirements for explosive ordinance/hazard training are another area needing review. This is a complex capability residing across all three services and different corps within Army. Therefore the review to date has been principally focused on reviewing RAE capability requirements (current and expected) and subsequently analysing the current training packages delivered. This RAE-specific baseline can then be expanded to address Army and joint needs where scope allows. The report has investigated the training continuum, from initial exposure on IETs through to the EOD training continuum. The aim of the report is ensure that RAE still maintains its engagement with other stakeholders, whilst ensuring that the corps continues to grow highly skilled EOR and EOD technicians. With the disestablishment of the Branch, the report will be handed on to SO1 Engineer Systems for completion in 2019.

Emergency Response Capability

FEB continued to support the development of the Emergency Response capability, including future employment, training and where the capability fits in under the current CMETLs. FEB has also provided technical advice on the procurement of rescue equipment (such as the light rescue equipment) and fire fighting/HAZMAT personal protection equipment. The re-positioning of FEB's WO1 AER into AHQ will achieve valuable continuity for the capability, while retaining a senior position for the trade in the process.

Sea-Land Series 2018 (EX HAMEL)

This year's exercise period saw the first introduction of a CBRND serial to a conventional force activity in some time. The serial reflected Army's revitalisation of the CBRND capability, through L2110. FEB was tasked to design, deliver and evaluate the serial as a baseline activity for future CBRND training. Noting the constraints upon the serial itself (and subsequent areas for improvement) the conduct of this activity nonetheless sent a strategic message about capability intent. Further, the integration of DSTG in the design, evaluation and technical reachback role successfully adopted their relationship with SOER into the conventional setting. The capability is still growing, and Army needs to recapture ground in this environment, but this activity was a good start in an area where the RAE will be expected to lead.

Land 8160-1 (under-armour mobility support) US Visit

In June 2018 – FEB provided SME support to the L8160 risk reduction activity (RRA) at the US Army's Aberdeen Proving Ground in Aberdeen, Maryland. The RRA's intent was to evaluate the performance of the Assault Breacher Vehicle (ABV), Joint Assault Bridge (JAB), and various attachments to the ABV which convert the vehicle into an Armoured Engineering Vehicle (AEV). While there were several objectives of the RRA, it was a good exercise in project management principles during the scoping phase of a project. L8160-1 also informs L400-3, L907-2, and L8120, while seeking to deliver an enhanced under-armour engineering capability in support of a combat brigade. The RRA team evaluated the utility of attachments such as a combat dozer blade, excavator-manipulator arm, 4-in-1 bucket, lightweight proofing roller, surface mine-ploughs, and an assault bridge-launch attachment for potential use. It was a highly-successful trial and greatly informed the L8160-1 plan as it goes to Gate 1 for approval.

> **"AACAP continues to be an important training exercise for Army's deployable engineering capability whilst making important contributions to the quality of life in remote Indigenous communities"**

Reflections…

FEB positions will no longer exist from the start of the 2019 posting year, and the Branch will stand down on 15th December 2018. As the last (for now!) Force Engineer, I'd like to publicly acknowledge the Branch staff efforts this year. It was never going to be easy to maintain focus and effort knowing that the FEB was closing. To their credit, they have set conditions for a smooth glide towards disestablishment through an extended handover period. FEB may not carry the flag beyond this year, but the work we do has been re-homed as best we can in the interests of the Corps. The weight of advocacy and advice will now spread a little further across the Corps – we all have part of the 'Force Engineer' role to play now.

At the macro level, RAE is currently experiencing a renewed interest in its capabilities and the role they can play in meeting Government's strategic objectives. Consequently, the 'Engineer Spring' we are seeing at the time of writing portends a time of tempo and prominence for the Corps, with expanding opportunities to showcase what we do, and how well we can do it. Ubique!

Army Emergency Responder Live Fire Training

Captain Liam Clarke

Burning car as part of a live fire fighting serial on Ex DINGO FURY

The Emergency Response (ER) Troop (TP) in the Support Squadrons of the Combat Engineer Regiments are often the overlooked stepchildren of the regiment when it comes to realistic and demanding training. This is potentially caused by the combination of the troop being overlooked during exercise planning due to the highly specialized skill set and the perceived difficulties in getting live serials approved. In 2016, 3 CER's ER TP executed a multi-day scenario as part of the Regimental foundation skills exercise Ex DINGO FURY which included a live fire fighting serial in a field environment. Contrary to initial perceptions, the training was not overly difficult to organise and the training value was immense, with all TP participants stating that it was the first time they had participated in a serial of the kind. The purpose of this article is two-fold; first to assure Army ER personnel that this training is possible and second to provide exercise planners with a framework that supports ER task specific planning and execution.

The Scenario

The overarching exercise narrative for 25 SPT SQN was centred on a semi-permissive environment supporting the local authorities of a territory recently liberated from MAF occupation. Specific to ER TP, they were to provide the emergency response capability via a field fire station for the designated AO over a 72 hour period while the local authorities conducted a refit of their capabilities. This meant the TP was responsible for military and civilian first response which expanded the range of serials which could be injected to the overall scenario. Some of the serials included responding to a civilian medical emergency, providing ground based Tactical Recovery of Aircraft and Personnel to friendly aircraft and a snap task to conduct personnel rescue from a toxic environment caused by a venting battery in an enclosed space. The highlight, and focus of this article, was to respond to a vehicle accident which would require a live vehicle fire to be extinguished; a secondary outcome of this serial was that it allowed the RECONNO to achieve a lifetime goal of setting a car on fire.

"I love it, but High Range in the summer is a dry place – let's not burn it all down." – SQN OC

The serial itself was relatively simple – a single vehicle accident adjacent to the AO's MSR, observed by an aerial platform and reported to ER TP through the SQN CP for action. On the ground this looked like a car body procured from the training area's UOTF (with the cooperation of Range Control) ignited with two trip flares and a quantity of ULP.

Overcoming Resistance

When the concept of this serial was proposed, the first response was often focused on why the serial could not be conducted, rather than how it could (at least that is how it seemed at the time to a RECONNO who wanted to burn a car). Upon reflection, this feedback was not so much resistance as input from professionals to ensure that the training was rigorously planned. To support other exercise planners this article will step through some of these first responses to first responder training and the procedures implemented as a result. I have taken some liberties with my paraphrasing of the questions, but ultimately it was the combined support of all of these personnel that saw the training executed.

To prevent the fire from spreading an area of level ground adjacent to one of the main roads in the sector was identified. The area was free from surrounding trees (so none needed to be felled) and a dozer from Plant TP was used to clear a 40 x 40m area to bare earth. An additional fire tender separate from the scenario was on site, prepared and running prior to the fire being ignited. This would allow the fire to be extinguished if it began to spread before the arrival of the participants, or if the participating vehicle failed for any reason. The MERO was in command of this vehicle and provided the Safety Officer for the activity. It was also stipulated that the serial would be postponed or cancelled in the event of high winds.

The car body was confirmed as being free from POL and glass by the SQN FRT. The Risk assessment and Environmental Clearance Certificate stipulated that only the minimum amount of accelerant (ULP) would be used based on the weather conditions. This provided flexibility to use more or less ULP if it was a clear/raining day. The accelerant was only to be applied to the vehicle seats/cushions as soon as practicable prior to ignition to ensure that it would not be spilled/leak into the soil and that it would be consumed during combustion.

"You want to burn a car – what about the environmental impact?"
– BDE Environmental Compliance Officer

"Your Brigade has a fire training ground, can't you just use that?"
– Range Control Officer

The topsoil from the scrape was used to establish bunds at the scrape edges and reinstated by Plant TP after the exercise. As part of DAMCON the car body and any debris was to be removed by Plant TP and disposed of appropriately.

Water was stipulated as the only medium to be used to fight the fire. The Environmental Compliance Officer was walked through the procedure for using AFFF from the fire fighting vehicles and was satisfied that the risk of accidental employment of AFFF was minimal.

The combustion products (smoke, particulates, etc.) cannot be contained and will cause some environmental impact – this is an unavoidable consequence of live fire fighting training. By removing all POL from the vehicle, inspecting the vehicle for hazardous substances and only using the minimum accelerant this impact is made as low as reasonably practical. Dousing the vehicle in water to extinguish the fire will result in a small amount of runoff which may also cause an impact to the environment. This will be contained in the cleared area minimising the impact to surrounding environments. The training area was sited over 500m from the nearest watercourse.

The first training ground had been out of service for years. Even if it had been functional, the repeated use of a sterile training area without diverse 'targets does not provide stimulating training. The difference between using the fire training ground and a serial such as this is analogous to an infantryman performing LF6 on a CAT A Range and conducting a live fire platoon attack on a CAT C Range. The additional training value justifies the use of the field training area.

While the serial does have an inherent degree of danger, it will be executed in a controlled environment to provide the firefighters with

SPRs Benc and Domrow attack a burning car on Ex DINGO FURY under the supervision of WO2 Behan

Isn't this just a bit too dangerous, what about the risk to ER TP personnel? – S35

exposure to a challenging and realistic serial. ER TP personnel are deemed competent through their trade training and are appropriately equipped to deal with more complex tasks.

Live fire fighting will always carry a degree of danger but the training value will outweigh this; indeed exposure to quality training will lower the risk when the TP needs to respond to a real emergency in an uncontrolled situation. Again, the level of danger balanced against the training value is comparable to a live fire combined arms practice.

Using similar controls to a demolition range is a useful litmus test for safety and best practice. An OIC (RECONNO) and Safety Officer (MERO) were appointed and on site. Access to the danger area was controlled by blocking the track with vehicles and sentries. The training serial was included in the TASMIS booking and Range Control were contacted on the Range Safety net for permission to commence the serial similar to opening a trace. The participants were under the supervision of the MERO and their section commanders just like a target supervisor. First aid equipment was on site in the participating vehicles and the safety vehicle on site was also capable of extinguishing the fire. The exercise was also supported by the Regimental Medical Plan which included a dedicated ambulance and medic.

Physically setting up the target vehicle was conducted in a deliberately sequenced manner which ensured certainty of firing. Two trip flares on command pull were secured into the vehicle where they would ignite the accelerant and seats – this provided dual non-electrical initiation. The command wires provided a sufficient stand-off distance for the firing party, and once laid out, were staked and marked to prevent personnel from walking across them. Immediately prior to initiating the scenario, the safety fire fighting vehicle was run up and the accelerant was applied to the vehicle from the opposite side to the trip flares. Once ER TP had departed the SQN location (a known distance away) the two flares were initiated and the command wires retrieved to remove a trip hazard.

OK, maybe you can do it, but have you thought of all of the necessary controls? – OPSO

"Make sure all of this is written down!"
– SQN 2IC

In the event that the serial had to be aborted, the command wires would have been clipped from the arming pin and the flares removed, rendering the target safe. A soak time would then be observed to allow the accelerant to evaporate.

All of the above controls and procedures were included in the key exercise documents, specifically the Risk Assessment, Health Support Plan, TASMIS booking, Environmental Clearance Certificate, Exercise Order and Safety Brief.

The most effective means of overcoming resistance was early engagement by the exercise planners with key personnel to explain not only the controls and mitigations, but most importantly to demonstrate the increased value of the training over more conventional options. The experience in 2016 highlighted understanding the quality and importance of the training and how it offset the risks or impacts was the most effective tool to turn personnel form resistant to supportive.

Training Enhancements

High impact training serials such as this are few and far between, so it is important to make the most of them. The 2016 serial was recorded by the RECONNO with a video camera to provide an accurate AAR tool. An unintended but particularly useful feature of the video was the Combat Net Radio soundtrack – having a radio on squawk mounted on the cameraman's armour behind the camera added this layer in real time. The video footage was then used that evening in the SQN CP for the OC to debrief the TP COMD and subsequently by the TP COMD to debrief their team.

"Really, all of this just so the RECONNO can burn a car?" – CO

The complexity of the scenario can be gradually increased to ensure continuously progressive training, mitigating skill stagnation. Multiple vehicles can be used, and these can be forced together, or rolled over, with plant equipment to realistically simulate a vehicle accident. Role players can be included for personnel of the TP not directly involved in fighting the fire to simulate crash survivors with various injuries. Vehicle hulks not on fire can have dummies inside to allow ER TP to practice their extraction techniques. Depending on the appetite for realism, animal carcasses can be strapped into the vehicle prior to ignition to demonstrate the effects of a vehicle fire and also provide body recovery training to ER TP. While this may seem unpalatable, it will provide realistic training for Army ER personnel's role in the battlefield clearance team.

Summary

The response from participants was that this serial was some of the best training in their trade they had experienced, and none had ever fought a live fire as part of an exercise before. Adhering to the controls ensured that the scenario was executed safely and as realistically as possible resulting in the value to ER TP far outweighing the effort expended in planning the serial – indeed, the achievement of a long term personal goal to burn a car was also immensely satisfying. The experience of 25 SPT SQN in 2016 proves that training like this is possible and I am optimistic that this article will reach some squadron and unit operations personnel and encourage them to plan and execute similar training. It should also show our ER Sappers that we can deliver them realistic, demanding and interesting training in our Regiments.

Armoured fighting vehicles

MAJ Ryan Orders

The JAB launching its bridge.

The enhancement of engineer capability through the armoured fighting vehicle program continues to be progressed at Army Headquarters. This year has seen the release of the Request for Tender to industry for project Land 400-3 Mounted Close Combat as well as vehicle testing conducted for project Land 8160-1 Under Armour Bridging and Breaching. Land 400-3 will assess industry responses next year and shortlist two offerings for test and evaluation activities.

Initial testing of Land 8160-1 vehicles occurred this year with support of soldiers and officers from across Forces Command. This testing occurred over a six week period at Aberdeen Test Centre in the USA. Two vehicles were put through their paces in some difficult muddy terrain; the Assault Breacher Vehicle and Joint Assault Bridge. The testing aimed to demonstrate the capability of the vehicles in providing mobility support (i.e. obstacle breaching) as well as the potential to conduct survivability and counter mobility works.

The types of tests included breaches of doctrinal obstacles such as anti-tank ditches, log cribs, tetrahedrons, hedgehogs, minefields, abatis and urban rubble. Whilst demonstrating the capability of the vehicles, it was also a valuable learning activity for Sappers to understand how tactical obstacle construction can be utilised to slow or stop an armoured vehicle. Survivability and counter mobility support focused on assessing the ability of the Assault Breacher Vehicle to conduct earthworks. The testing was highly successful and even exposed the Americans to some capabilities of the vehicle they had not previously considered.

The final days at Aberdeen saw the live fire of two Mine Clearing Line Charges. At almost 800kg of explosive per charge, the 100m long explosion was an awesome sight to see. Army Headquarters will continue with a second serial of testing in October 2018 where the Assault Breacher Vehicle will conduct mobility tasks under remote control operation. Seeing the vehicles in action was a great opportunity for selected Sappers to express their opinions, understand the capability and shape the introduction of an armoured capability to the corps.

Top: The ABV with grapple arm reduces a car ostacle.

Middle: The Assault Breacher Vehicle (ABV) in four configurations that were tested in the US this year. (left to right) ABV fitted with bridge, ABV fitted with mine plough, ABV fitted with dozer blade, ABV fitted with excavator arm

Bottom: ADF personnel observe the ABV with dozer blade reduce an anti-tank ditch.

Land Engineer Modernisation

MAJ Alexander Buenen

The ten-year vision of new and upgraded engineer equipment continues. In 2018 one major system reached Final Operational Capability – the Striker XC Fire Truck – with another due to reach this milestone by mid-2019 – the Dry Support Bridge. In 2019 the Engineer Systems Cell, Combat Support Program, will grow to include responsibility for Chemical, Biological, Radiological and Nuclear Defence projects. Other cells within Land Capability Division will continue to oversee improved new and capability for Counter-IED, Route Clearance, and a range of vehicles that will contribute to Engineer tasks – reconnaissance, manoeuvre, breaching and logistics.

Projects in delivery:

LAND 988 – Replacement Aviation Fire Trucks. All 28 Striker XC Oshkosh Fire Trucks have been delivered to Army and Air Force, and are fully operational. Final Operational Capability (FOC) was declared in June 2018, with outstanding infrastructure works to be completed by November 2018. In future, LAND 8180 – Aviation and Field Fire fighting Trucks will address future combat rescue requirements in the Battlefield Clearance Zone with an FOC of 2028.

LAND 155 – Enhanced Gap Crossing Capability. The Project is delivering four bridge types:

- **Improved Ribbon Bridge (IRB**) replaces the Floating Support Bridge (FSB) with an improved carrying capacity of MLC100. SME and the CERs have received one complete set each, as well as upgraded Bridge Erection Propulsion Boats (BEPB) mark II.
- **Foot Bridge** enables rapid dismounted gap crossing up to 100m. Each Cbt Bde has received four sets, with two each at SME and SOI. Training is complete, and further analysis on footbridge training and doctrine will be conducted in conjunction with CATC over the next 12 months.
- **Dry Support Bridge (DSB)** offers an expedient 46m gap crossing capability or two 22m Bridges, at MLC 90, constructed by an Engineer section. Each CER will receive two, with one at SME. Final delivery to units is expected early 2019.
- **Enhanced Medium Girder Bridge (MGB).** Each CER will receive one 22-Bay double-story set and one 5-Bay overbridge. A portion of the legacy MGB fleet will be reconstituted for use

The 3 CER bridging team conducting training on the Dry Support Bridge at Holsworthy in September 2018, as part of L155.

as a training fleet at SME. Final delivery to all units is expected early 2019.

From January 2019, two Bridging NCO positions will be established at each CER and at SME in perpetuity. For 2019 only, the six CER NCO positions will belong to CERs, but be posted to and commanded by SME – their p riority will be DSB training and training development in order to ensure capability maturity in 2019.

Projects in development:

Land 8120 Phase 1 – Engineer Support Platforms. Delivers a complete replacement of all C Vehicles (earthmoving equipment) and off-pavement D Vehicles (material handling equipment) for Army, Navy and Air Force. This is the first time the entire fleet has been addressed by a single project, as opposed to individual platforms being replaced on an as-needed basis. The Project is on track for tendering in early 2019, meaning new equipment is expected to be delivered by 2021. Initial priority will be given to replacing obsolete platforms, allowing the Corps to maintain the required level of capability while ensuring appropriate employment of the extant fleet.

The Project has observed several innovative proposals from industry, including examples of teleoperation kits; the aim of which is to remove Sappers from hazards by employing plant remotely. The significant advances in plant and material handling technology since the current fleet was procured means that the new fleet will be more powerful, efficient and capable. Equipment will not be limited to Support and Construction squadrons – both motorised and mechanised Combat Engineers are slated to received new and improved light plant assets. This will enhance our forward-most battlefield capabilities, working in concert with the armoured engineer vehicles to be procured under L400 and L8160.

The Improved Ribbon Bridge is tested in the 7 Bay Raft configuration (100t capacity) during introduction into service testing November 2018, as part of L155.

LAND 2110 Phase 1B – Chemical, Biological, Radiological and Nuclear Defence. Provides a significant increase in CBRND capability for the ADF, including an electronic Warning and Reporting system, new protective ensembles and a suite of decontamination systems. A prime contract has been signed and will start delivering from mid-2019 with the readying Brigade and training institutions afforded priority.

The CBRND training continuum will be refreshed and additional training requirements which is expected that RAE will assume some responsibility for Army CBRND training. An increased level of CBRND training has already started with 1 RTB commencing the CBRND Basic course for all ARA soldiers. FOC for L2110-1B will be reached in 2023.

LAND 154 Phase 2 – Weapons Technical Intelligence. Provides a Level Two exploitation laboratory, to be located with 1 Int Bn, providing Defence with the ability to conduct higher-level exploitation activities. Initial Operational Capability (IOC) will occur in 2021.

LAND 154 Phase 4 – Joint Counter Improvised Explosive Device Capability. Upgrades Force Protection Electronic Counter Measure (FPECM) systems, delivers an enhanced route clearance capability, and replaces exploitation and neutralisation (IEDD/EOD) equipment. This Project is in its capability development phase and will be considered for Government First Pass approval in mid-2019. IOC for the first tranche is scheduled for 2022.

Exciting new equipment and capabilities continue to be planned and introduced, requiring continuous assessment and balancing of how the RAE trains, fights, and is organised. As AHQ continues to oversee these projects, open communication remains important to ensure success. Innovation and leadership from all levels of the Corps is sought and encouraged.

Directorate of Officer Career Management – Army

MAJ Gregory Jones

The Corps of Royal Australian Engineers is currently well positioned for current and future challenges. This is not due to equipment, material resources or infrastructure. We are well positioned because we have highly intelligent, professional, driven Officers and Soldiers who are dedicated to the Corps and able to adapt to the many challenges we face. You may wonder how I can say this after only recently stepping into the role of Career Advisor, however the thorough handover and detailed appraisal of the Corps provided by Lieutenant Colonel Davis made the Corps' strength abundantly clear. We are well positioned, and I am confident that we will rise to, adapt for and overcome future challenges, whatever they may be.

Underpinning the talent of the individuals within our Corps are some key factors that strengthen us as a whole. The Corps of Royal Australian Engineers has continued to develop and foster a diverse workforce. This requires excellence across specialisations in Construction, Combat and Special Operations. We have fostered diverse skill-sets such as project management, force protection, dive, search, explosive ordnance disposal, exploitation and chemical, biological, radiological and nuclear defence, just to name a few, all of which strengthen and diversify the exposure and employability of the Corps as a whole. Few Corps have to maintain the breadth of talent and skills that we have to, yet I have already seen that we are not simply maintaining, we are developing and evolving these skills. The passion and efforts of individuals continue to strengthen the Corps from the bottom up, meeting the intent provided from the top down. That said, there have been some challenges faced by the Corps in 2018. This year has seen the final break-up of the Force Engineer Branch and redistribution of tasks across the Corps. It has also seen the transfer of Geospatial Officers to the Australian Intelligence Corps. Despite these two rather large muscle movements, we have handled the changes without turmoil, supporting both transitions and continuing to provide effects to Army as directed. Both decisions have there benefits, as I'm sure we will see in the years to come.

When we look at 2019 and beyond, there is definitely some good news for the Corps. Strong representation from within the Corps resulted in an excellent cohort attending Command and Staff College next year, and equally experienced and competitive candidates have dominated both the Corps and non-Corps plots for Sub-Unit Command next year as well. We have continued to recruit the best and brightest from Duntroon, and will once again see a very dynamic group embark on Regimental Officer's Basic Course in January 2019. Competition at the rank of Captain is increasing, with consistent high performance required for promotion to Major. This can only be a good thing for the Corps. While we are currently under-subscribed for Captains, we will see this hollowness gradually filled through recruitment, with an expectation that the Corps will be at capacity by 2021. We are in a very healthy position, and the future is filled with opportunities, especially as we compete strongly against other Corps for exciting and challenging positions both at home and abroad.

As I stated at the outset, the Corps is well positioned for the future. Our manning levels are healthier than many other Corps, we have recruited talented and driven individuals, and we are competing well at all levels. With the raft of capabilities that are expected within the next decade, and the challenge of current and future operations to support and enable, we should all expect to be busy. However, despite these challenges and the fulfilling work that we do, my final word as Career Advisor is to ask that we all take the time to step back, appreciate our friends, families and loved ones, and ensure that we are balancing life, not simply chasing the next work milestone. Thank you, I look forward to seeing many of you early in 2019.

Soldier Career Management Agency – RAE CMC18

CAPT Ben Turner

A successful Career Management Cycle 2018 came to a close with the release of Second Round posting orders on 20 Sep 18 and the commencement of the Target Rank Personnel Advisory Committees (PAC). The RAE Team would like to take the opportunity to 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 2018 and for their professionalism in taking an active role in the management of their careers.

WO2 Portfolio

CAPT Ben Turner

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 2019 SSM appointments:

1 CER
1 FD SQN – WO2 Joseph Macklin
23 SPT SQN – WO2 Matthew Tanner

2 CER
2 CE SQN – WO2 Clinton Rowe
7 CE SQN– WO2 Adam Keys
OSS – WO2 David Squires

3 CER
18 CE SQN – WO2 Thomas Jesser
25 SPT SQN – WO2 Daniel Thorne
OSS – WO2 Beau Simpson

Additionally, congratulations to the below 2019 overseas appointments:

UK RSME – WO2 Matthew Wilson
IPDIV Timor Leste – WO2 Colin Walker
IPDIV PNG – WO2 Greg Wright
IPDIV PNG – SGT Matthew Tritton

Combat Engineers

WO1 Scott Middlemis

2018 promotions:
LCPL – 31, CPL – 23, SGT – 8, WO2 – 15

CMC 20 PAC:
ECN 096 TR SGT – 21, ECN 432 TR SGT – 14, ECN 096 TR WO2 – 15, ECN 432 TR WO2 – 5

The pressures at the different ranks are the same as last year, with sufficient asset at the SPR rank the Units have managed the LCP/CPL vacancies by identifying worthy SPR/LCPLs to promote.

Vacancies remain at all units at the SGT rank for ECN 096 and ECN 432, however, changes to the ECN 432 policy has enabled up-skilling of EOD Tech CPLs (ECN 432-2) to cover some of the SGT EOD deficiencies.

In the short term, changes will be made to the Manual of Army Employment for all RAE trades. Once they are complete, any impacts relating to career management will be communicated through the CoC to those affected.

Construction Trades

WO1 Darren Parsons

SGT PAC
ECN 270 – 4 Mbrs
ECN 374 – 6 Mbrs
ECN 385 – Plumber(2), Electrician(2)

WO2 PAC
ECN 270 – 3 Mbrs
ECN 374 – 2 Mbrs
ECN 385 – 1 Mbr

Substantive Promotions in 2018
ECN 072 – 1 x CPL, 2 x LCPL
ECN 101 – 1 x LCPL
ECN 125 – 1 x CPL

ECN 314 – 2 x CPL, 1 x LCPL
ECN 270 – 8 x CPL, 6 x LCPL
ECN 374 – 2 x SGT, 1 x WO2
ECN 385 – 2 x WO2, 2 x SGT

Construction Trades

Following on from the Forces Command Modernisation Directive in 2017 (Plan Keogh), the Corps successfully presented its future structure, including the construction trades, to the Employment Category Review Endorsement Meeting (ECREM) this year. In mid-2019 the revised ECREM outcomes will be presented to the Defence Force Remuneration Tribunal (DFRT) for acceptance and ratification. This will see a new structure, providing substantial changes to the construction trades across the Corps.

Despite the hollowness and criticality of some of the Employment Categories, the future of the Corps construction assets is shaping to be one of positive change. Larger directed training numbers have been implemented, seeing a future throughput that should see us with a sustainable vertical trade model well into the future. With support from all RAE units, the training and sustainment of our horizontal construction capability will be enhanced; paving the way for our future acceptance of our armoured engineering equipment.

The ADF's transfer of the Geospatial Technician employment category to the Intelligence Corps has seen some high level and robust negotiation and dealing to retain the Surveyor capability within the RAE. A future amalgamation with the Drafting employment category; combining their data management skill set, will enhance our RAE capability well into the data centric future. While we have some way to go with the trade model the future prognosis looks good for this capability.

Future opportunities for our trades are being explored outside of the Land Series of exercises (Ex HAMEL and TALISMAN SABRE) and the yearly Army Aboriginal Community Assistance Programme (AACAP). Recently there has been consideration for future off shore projects, which will allow the Corps construction trades to augment whole of government efforts, within our regional sphere of influence. Whilst this increases our operational tempo, the opportunities that may present to the Corps should be seen as a great opportunity to gain skills and experiences that won't be readily available to others within the ADF.

To everyone moving on posting and those that have earned a promotion, I offer my congratulations and look forward to catching up with you when the career guidance tour gets to your unit. For those that have chosen to move on from the ADF, I wish you good luck for whatever your future endeavours might be, however, remember you have earned the right to be called - SAPPER.

Emergency Response, Geospatial and Multimedia Technician

WO1 Lee Palfrey

On 01 July 2018 the ECN 423 Geospatial Technicians and the ECN 180 Multimedia Technicians formally transferred from RAE to AUSTINT. This brought to an end 22 years within the RAE family and the end of a relationship that extended as far back as 1910.

The ECN 141 Emergency Responder trade has had an interesting year as it shapes to be presented to the Defence Force Remuneration Tribunal (DFRT) for acceptance and ratification, following the ECREM earlier this year. A likely restructure of the trade for CMC 2020 has necessitated a year of minimal movement, with a limited number of postings being promulgated. The trade has healthy numbers with most Units containing ECN 141 Sappers above the establishment asset. This should ensure the continued health of the trade as those members progress through the ranks.

School of Military Engineering

LTCOL Dave Evans

2018 has seen another busy year for the School of Military Engineering – "The Engineering Centre of Excellence". The New Command Team of LTCOL Dave Evans and WO1 Glen Donaldson quickly set about establishing themselves at the helm and started the year with an SME Open Day, to showcase the School and the Corps Museum to all of our families and friends. The event was very well received and will be an annual event going forth.

Up front I would like to thank all the RAE Unit Command Teams and their personnel that have supported SME throughout the year. Without this ongoing support many of the achievements that the School is charged with could not be realised, and I have enjoyed the opportunities to meet so many of our Sappers from each and every Unit. While I acknowledge that this need competes with the many demands back in their Units, we have tried hard to ensure that they gain the most from this experience and at times we have been able to return them to you with additional skills and qualifications. With some of the increasing numbers that we have coming through the Training pipeline, I assess that this need will continue in 2019, and can I take the opportunity to thank you in advance for your ongoing support.

Within the first quarter of the year the School had received a number of visitors, including COMD 1 BDE, COMD FORCOMD and the Force Engineer who continued to demonstrate their ongoing support to the important role that we perform not only to the Corps, but also to the ADF Engineer Community. The steady rate of visitors continued throughout the year and saw us continuing to engage and showcase the Corps' School to numerous International partners and delegations which remain a valuable opportunity to maintain our extensive and collaborative networks.

The flexibility and resilience of the School was tested early in the year when a Bushfire swept through Holsworthy Barracks creating some tense moments as the flames cut the power and communication across the base. Fanned by high winds and hot conditions the fire moved through the Barracks at a rapid rate, however, I am pleased to report that no personnel or facilities were hurt or damaged and hats off to our NSW Fire and Rescue and Rural Fire Service Teams who did a fantastic job. Further proving that "every cloud has a silver lining", the fires provided one our IET Troops a fantastic task of tree felling and restoring a WWI railway line in vicinity of the Holsworthy Centre At the end of June the School formally farewelled our Geospatial Engineering Wing out of the Corps and across to the Australian Intelligence Corps as the last element to affect this directed change. The newly named Geospatial

Intelligence Wing now sits under the Command and Control of the Defence Force School of Intelligence (DFSI), although remains in the Steele Lines precinct at Holsworthy Barracks.

In addition to delivering on our Directed Training Requirement (DTR) suite of course the School bore witness to the role out of the Dry Support Bridge as part of its ongoing support to the Modernisation Line of Effort. All three Combat Engineer Regiments as well as select School Staff have now had personnel undertake the Training as part of the Initial Operating Concept and the School will continue to deliver on this in 2019 as the L155 CIT is rerolled back after their hard work of getting the capability into the Corps.

2018 saw a number of the SME Team deploy or return from Operations, and this experience was well invested back into the Corps. MAJ Dave Carew-Reid returned from being embedded with US Forces as the CJENG, TAAC-S, CPL Hall fulfilled a successful deployment to JTF 633 AMAB in the Q Store, Mr Jason Lilley also deployed to AMAB as the JTF633 philanthropic, and both CAPT Dylan Storrie and the RSM, WO1 Glen Donaldson remain deployed, and will be until well into 2019.

As the 2018 year comes to a close the School will represent the Corps on 04 Nov 18 in exercising its Freedom of Entry to the City of Liverpool, some 60 years since it was granted to the Royal Australian Engineers. While the drafting of this article pre-dates the event, it is assessed that this will mark a significant milestone for both the Corps and the Community that we serve and will be a fitting way to round out another busy but successful year at SME.

Finally, I would like to take the opportunity to thank the entire SME Team for their tireless and selfless efforts throughout 2018. All should feel very proud of their various contributions to the Corps, and for those that will be moving on to other Units, I wish you all the very best and trust that you will continue to remain in contact and engaged with the School. Those of us that are continuing in 2019 are charged with one of the most important roles and that is to impart our knowledge and experience on to the next generation of Sappers. It has been an honour to be at the helm and serve with so many of our finest Engineers and I look forward to continuing to deliver on our vitally important Mission in 2019.

Geospatial and Multimedia Techs on parade, to transition across to Australian Intelligence Corps.

Special Engineer Wing

MAJ Geoff Small

Special Engineer Wing (SEW) has continued to provide the Corps with updated and innovative training in a number of key Corps capabilities. 2018 has seen the Introduction Into Service (IIS) of key land projects within the Wing as well as the continual review of LMP's and doctrinal publications. Below is a brief description of what each cell within SEW has conducted throughout the year.

Demolitions

SEW Demolitions cell have run a number of courses throughout the year, as well as handing over OIC Demolitions to the current QMSI WO2 J Draunidalo (UK). 2018 has also seen the release of the new LWP-G 3-6-6 Demolitions and LWP-G 7-3-5 Demolitions and Mines: Range Practices and Non-operational Tasks.

A reminder that the Demolitions Supervisor Requalification course is now live on CAMPUS for those that need to requalify and are inside their five years.

There is ongoing research continuing into new and emerging suites of explosives to bring the Corps demolitions capability into the future. Concepts continue to be discussed and examined and will be looked at in more detail in 2019 including new preformed breaching charges and upgrades to the Family of Military Explosives (FAME).

Search

Search cell has been busy running the SUBJ 4 for CPL (S4CC) & SGT (S4SC) search & Explosive Hazard Reduction phases for the Corps. The SUBJ 4 CPL course encompasses Search Team Commander & Explosive Hazard Reduction during a five-week course that teaches SPR's to perform the duties of a Combat Engineer Section Commander in an explosive hazardous environment.

The SUBJ 4 SGT course provides the students the qualification of Search Advisor with the students performing multiple reconnaissance & planning of all search operations.

In addition, we have also conducted the Search Advisor package to the RAE Regimental Officers Basic Course (ROBC). Search cell continues to provide external support to the School of Infantry (SOI), DEOTS and AHQ.

Watermanship and Bridging (WAB)

During the last year WAB has seen the development of the WAB yard with two new buildings to house Bridge Erection Prolusion Boat Mark II (BEPB MkII) and the Dry Support Bridge (DSB). It has also seen the completion of a storage yard for Improved Ribbon Bridge (IRB) at Camp Sapper. WAB was also provided a Medium Girder Bridge (MGB), which consist of two refurbished bridge set, two Portable Pier sets and one Link Reinforcement set.

With the IIS of the Evinrude 55 OBM MFE (Multi Fuel Engine), members from SEW were sent up to Townsville to conduct training with 2 RAR at Ross Island Barracks. In July, the first of the new OBMs arrived at SME with a further 5 OBMs to be delivered in early 2019. These new OBMs will be introduced into the IET courses once they arrive.

With the commencement of the Dry Support Bridge (DSB) training (being run by L155 CIT) comes a new and exciting time for the WAB Cell. This will see the DSB equipment being housed within the WAB yard in early December and WAB staff to take over training of the DSB at SME early 2019.

Chemical, Biological, Radiological, Nuclear Defence Cell (CBRND)

The CBRND Cell has had an extremely busy year conducting 15 Tri-Service CBRND related specialist courses including SUB4 CPL & SGT (S4CC and S4SC) promotion phases. The cell has taken the lead roll with the rollout of new CBRND equipment under the CBRN Remediation program. This has seen the introduction of new Tier 1 and Tier 2 detectors chemical and radiation detectors, CBRN Individual Protective Ensemble (IPE) and a host of CBRND ancillary equipment including light to medium scale personnel and equipment decontamination.

Additionally, staff of the CBRND Cell have provided instructor support to a host of units across all three services. Instruction on force preparation and continuation training being the main focus of the support. And finally, one member of the cell has travelled overseas to participate in a combined military exercise to test CBRND Advisory skills and warning and reporting procedures at the strategic level.

The Explosive Detection Dog (EDD) Cell

The EDD Cell had yet another busy but productive year. The Cell was well supported by external instructor support from 3 CER, 1 CER

and SOER. This enabled the Cell to effectively deliver the EDD Supervisor Course (EDDSCC) and the Basic Dog Handler Course (BDHC).

12 dogs were qualified as newly trained EDD, and four ARA members and one RAAF member were certified as EDD Trainers. The BDHC is currently on track to qualify 5 x ARA students and 4 x RAAF students as certified EDD Teams.

The cell had numerous visits from external agencies during the year IOT observe the EDD training at the kennels. These agencies included members from RAAF, VICPOL, SA USAR and Taronga Zoo staff.

The kennel staff would like to thank the assistance provided by the numerous personnel within the LMA that have participated in the Explosive Detection Training Dog Program (EDTD). The program has proven to be highly valuable for the dogs and will be continued into the future.

The EDD Cell has been proactive WRT sourcing high quality dogs for service in the ADF and has achieved this by travelling twice to Australian Border Force. Later in the year, 2 x handlers will travel to NZ IOT establish an ongoing business relationship with several breeders to supply quality dogs for further training at SME in the future.

Also, a special mention to George Hulse (LTCOL retired) for the donation of 2 x EDD pictures depicting SPR D Smith and EDD Herbie to the SME Museum. 2019 will also see the EDD Capability Manager (WO2 J Cannon) step away from the EDD Trade, after 16 years of service and welcome back WO2 Cameron Elliott. The EDD Cell wishes both soldiers all the best in their future careers.

Countermine

Countermine cell is responsible for running the Australian Protected Route Clearance Capability (APRCC) suite of courses for SME including Commanders course and Husky operator course.

The Husky Operators course is a three-week course that teaches those who already have MR2/PMV Driver qualification how to operate and maintain the Husky multiplatform protected vehicle, operate the PI metal detector and GPR Panels, and operate the Interrogator Arm (IA).

The APRCC Commanders course is a two-week course that instructs Search Advisor qualified personnel on how to conduct Route Clearance operations using the APRCC in the VBS3 Simulated Environment that we have here at SME.

SEW is not responsible for running the Self-Protective Adaptive Roller Kit (SPARK II) or the High Mobility Engineer Excavator (HMEE) courses but are available to assist units in running their training if they are unable to do so.

Mine Warfare (MWF)

The MWF Cell has provided instruction on the SUBJ 4 CPL & SUBJ 4 SGT suite of courses. In addition to the training provided, the MWF cell has developed a FORCOMD Innovation Proposal: Electronic WG103 Minefield Record Application to which was successful resulting in a letter from the Director General Training and Doctrine Command, commending & endorsing the submission.

MWF Cell is also providing support to DSTG on the Hyper Spectral Drone Program assisting with identification of Nuisance Minefields utilising the UAS system. The MWF cell has also created a revised LMP for the PELCC & VMR3G ahead of schedule exceeding CATC timelines. In addition, MWF Cell is providing Capability-Development of new Mines and Delivery Systems, including tactical employment. MWF is currently reviewing and enhancing the ADF & RAE capabilities by assisting with a revised 21st Century MWF program.

Combat Engineer Wing

LTCOL Bill Love (USA)

2018 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 New Zealand Defence Force, His Majesty's Armed Forces of Tonga 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 the Officer Commanding position; filled by a United States Army Engineer (USAE) Lieutenant Colonel/Major and an Initial Employment Training (IET) TPCOMD being filled by a Captain from the Papua New Guinean Defence Force.

Throughout the training year the ARA and Part-time 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 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 Troops back into Intermediate Tree Felling with our ongoing arrangement with the Majura Training Area continuing to develop. The result being 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.

The wing has also been fortunate enough to link in with the 6th Aviation Regiment (6 AVN) giving trainees an exposure to airmobile operations as well as enhancing the training opportunities for both SME and 6 AVN. This opportunity was open to the IET and ROBC courses giving

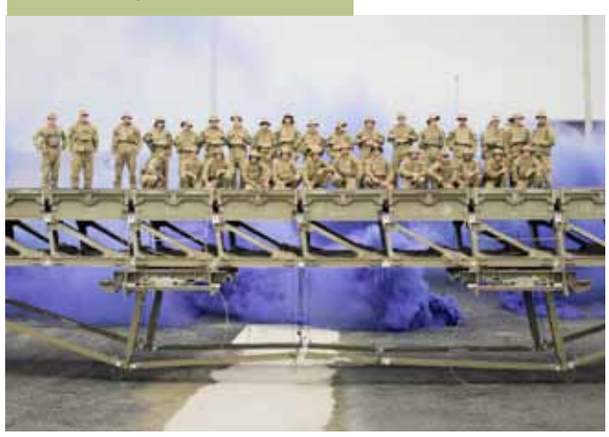
CEW on the SME parade ground.

the staff an appreciation for the planning and preparation involved in airmobile operations, further enhancing individual and collective skills to take forward into a combined arms environment.

Within the CEW Promotions Cell the 2018 delivery of the ROBC was refocused 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 in to more contemporary examples of military engineering. 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 Regiments.

Again in the Officer training space, the three week Engineer Operations Officer Course (EOC); also run out of the CEW Promotions Cell, aims to prepare senior RAE LTs and Junior CAPTs for employment as an Engineer Squadron or Regiment Operations Officer. 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. Furthermore, components of the EOOC were moved to Blended Learning using the Australian Defence Electronic and Learning Environment (ADELE), used widely throughout training and education institutions. This system caters for how younger trainees approach learning; self-paced and through maximum use of technology. These major changes have received positive feedback and have significantly improved the training opportunities and development within Officer training.

IET Course 0089 during their bridging serial of their final field activity, Ex BARDIA.



As 2018 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.

Construction wing

MAJ Simon Neilsen

Construction Wing (CW) has been dynamically working within both the training delivery and training development space for 2018. The Wing has surged effort toward the development and delivery of several pilot courses, in particular; Subject 4 WO2 Construction, Subject 4 WO1 Construction and Weapon Effects and Force Protection Course (WEFPEC). Further, it has continually sought out improvements and training efficiencies within existing curriculum, such as with the Civil Construction Plant Course (CCPC).

Trade Training Troop (TTTP) has continued to perform well. This has seen the management of Defence Construction Trade Trainees improve with a continued stream of new tradesmen and women completing their apprenticeships before posting onto both our Army as well as RAAF units.

The decision to adopt a Joint training model with combined RAAF and Army personnel at CW has proven successful, ensuring consistency in training across the services. This has shown excellent potential within the Joint operating sphere and will continue to improve.

In addition to delivery of training the Wing has been able to provide support to 17 Construction Squadron in its delivery of AACAP, 1st Combat Engineer

Regiment whilst participating on Exercise HARRI HAMUTUK 18, as well as other driver and C Vehicle training being held external to the School.

In 2019 it is expected that the Wing will continue to improve the delivery of training and maintain its focus on ensuring courses delivered meet the capability requirements of both Services. The continuation of the new model for SNCO Subject courses has also created a benchmark for future course delivery to our senior tradesmen and junior officers alike.

The adoption of the WEFPEC has seen SME try to close the knowledge gap within the services regarding Force Protection and its application. This is particularly important to wider ADF, since there is only a finite amount of training currently available that specialises in weapon effects and force protection. This course provides supplementation to the more specialised course, allowing more technically qualified members to receive training which will provide benefit to their Commanders into the future.

Overall 2018 has been a rewarding year for CW which has seen some excellent training delivered, but more importantly the continued development of training to ensure Corps capability requirements are met. It is envisaged that this will continue into the future, which provides excellent scope for the Corps, especially within the Construction Trades.

Civil Training Troop

LT Jacob Frahn

Civil Training Troop has maintained a high tempo of course delivery in this year. We have evolved our existing courses and incorporated ongoing changes to be more up to date.

Civil Training Troop has seen the delivery of one Civil Construction Plant Courses (CCPC), four Crane Courses, one Soils Technician Course, one Geo Technician Course and two Promotional Courses – Subj 4 CPL Civil and Subj 4 SGT Civil. This is consistent with annual course delivery trends.

Civil Troop has also seen the cancellation of several courses as availability of members has been low, which is mainly due to a variety of factors including operational tempo and the FORGEN Cycle.

Specialist courses are crucial to the capability the Corps provides, along with providing sappers relevant training that will keep their trade skills up to date with industry practice. There is also a general shortage of Plant Operators with units holding maintaining vacancies across the board. Noting this shortage, of particular concern is the cancellation of CCPC due to minimum panel size not being met. If the Corps continues the trend of not releasing personnel to attend these courses and places unit needs above that of the Corps the issue will exacerbate.

The troop provided significant support to external agencies and groups in the past year - one of which is LAND 8120, where the troop provided the AHQ team with subject matter expertise on several occasions and even facilitated a visit to the school for the project team. Another field of development has been the continued improvement of the CCPC LMP which has resulted in enhanced training that accurately targets the requirements of the employment specification and most importantly delivers better capability to Army.

Following on from last year's major review of the CCPC, the final changes have been made and we look forward to the program going live for next year's courses. This will result in training that is more aligned with current industry best practice and the needs of our supported units.

The Civil Circle newsletter has continued with great success this year attributable to the efforts of WO2 Moore and his innovation. I hope to see this excellent practice continue past his tenure. The Troop has worked extremely hard through several difficulties this year to deliver a successful training calendar and I look forward to seeing this success continued into the next training year.

AFENG course completed the pavement phase.

Plant operating at SME.

Trade Training Troop

LT Brendan Walker

Trade Training Troop has continued to focus on providing diverse training with staff constantly managing and sourcing contractors to provide on the job training for over 75 trainees. As well as keeping current with frequently changing construction industry standards and trends. The current military training continuum has been further developed over monthly training blocks focusing on foundation skills concluding with EX TRADIE ASSAULT in Majura. Ensuring the trade trainees maintain a base level of soldiering while undergoing up to 3 years technical trade training.

The troop deployed numerous small teams of trainees to support AACAP, OP APEC ASSIST in PNG and Ex HARII HAMUTUK in Timor-Lesté. This year also provided the opportunity for several members of the troop to represent Army in sport with CPL Chapman and SPR Luafutu selected for the Army Rugby side touring Fiji and SPR's Emond and Monahan playing in the W-AFL competition.

By the end of the year the troop will have successfully graduated 10 Carpenters, 5 Plumbers and 6 Electricians who will be subsequently posted to units in the wider ARMY and RAAF with more to follow in the first few months of 2019.

Construction Management Troop

AFENG Training – FLTLT Emily McSkimming

Airfield engineering training for Air Force was integrated into SME in 2016. This was a successful endeavour and a large amount of courses for Officers and Airmen/Airwomen are now delivered at the school in a joint-training environment.

The 2018 AFENG Officer training continuum was delivered to four trainees who all graduated successfully and delivered fantastic results. The training delivered to the trainees captured the diverse and technical skill requirements of Airfield Engineering Officers. The trainees were taught about their airside role within the wider Air Force. There was a focus on the airworthiness of our airfields which are used as a platform to launch air power. The

Members of the Engineer Survey Cse collecting survey data

trainees were successfully able to conduct Airfield Surveys which is the core skill of the specialisation and allows them to determine whether an uncertified airfield can land a range of different aircraft.

The students also learnt about the landside responsibilities of the AFENG Officer. There was a strong emphasis on construction management and project management. The students also participated in the WEFPEC which was delivered successfully for the second time.

A key highlight of the AFENG training continuum was the successful delivery of the pilot AFENG Pavements course. This course was implemented as technical continuation training in the design of airfield pavements. There was also a practical component where students were able to conduct simulated airfield damage repair on a number of different surfaces. This included patch repairs on asphalt, using cold and hot mix. It also included concrete repairs including crack repair, patch repair and the placement of new tie bars for slab extension.

Subject 4 Construction Core

SGT Craig Ward

2018 has seen three CPL Construction Core Courses with 30 trainees qualified as Construction Foreman, and one SGT Construction core Course with 12 trainees qualified as Construction Works Supervisors. These Courses have provided a good mix of Army and RAAF with a variety of Vertical and Horizontal trades as well as two members from Fiji.

CMTP continually strive to ensure that Trainees are up to date with current policy's, which is exercised at the end of CSE when trainees are taken on a site visit with the support of the NSW Roads and Maritime Services. This gives the trainees the opportunity to ask questions and see firsthand how their newly taught skills are put into practice on a live task.

Subject 4 WO1 and WO2 Construction Management Courses

FSGT Owen Brooks

In line with the first principles review, the SME is undertaking a deliberate re-development of the entire RAE/AFENG Engineer Individual Training Continuum (EITC) with a capability and training efficiency focus. Its aim is to optimise training delivery and provide a simplified, holistic, adaptive and capability-focused training continuum. This optimised effort reflects the One Defence approach; and on delivering a more dedicated approach to managing 'joint' capabilities.

Developments to the RAE/AFENG EITC have historically been completed in isolation, resulting in duplication and inconsistency. The training continuum was found to be overly complex and subsequently restricted our ability to effectively manage quality and change. As a result, training delivery was inefficient and did not achieve its full potential in meeting Employment Specifications (ES) and capability requirements.

As part of this redevelopment of the EITC the SUBJ4 WO2 and WO1 Construction courses have been reviewed and are being transformed into ADF Construction Management Courses better meeting individual and unit capability demands.

These ADF Construction Management Courses seek to prepare trainees to conduct construction management tasks both domestically and overseas. Using the three Project Management Lifecycle phases as a framework, the courses have been developed using both civilian and military examples to provide the underpinning knowledge to effectively manage projects.

The courses have been developed to align with national Units of Competence (UoC) to ensure that ADF Project Managers have the required knowledge to effectively develop and deliver projects in the ADF. Through the conduct of

the course, trainees will also complete the requirements for the Consolidated Complex Procurement and Contract Management UoC with the additional benefits of using existing ADF systems with construction examples.

Works Supervisors operate as the interface between Defence and civilian organisations (industry, other Government agencies), and therefore industry credibility is an important reputation and project quality risk control.

These courses are moving our engineers into the 21st century and preparing them for success within a One Defence management framework to deliver the best capability to the ADF.

Engineer Survey Course

CPL Glen Piper

CW delivered the Engineer Survey Course to 3 trainees from 19 Feb to 18 May 18. The course articulates the standards and training requirements to upskill soldiers to perform the duties of an Army Surveyor. The training provides them with the knowledge and skills required to undertake a range of survey tasks related to our workplace.

During the course, the trainees conducted a range of tasks, from collecting basic feature survey data collection to completing a road and a building set out ready for construction. Trainees also had the opportunity to gain civilian skills in the use of Computer Aided Drawings (CAD) and post processing data, Trimble Business Centre (TBC).

The course was well received, with all 3 trainees gaining valuable knowledge and skills, and building confidence to conduct simple and complex survey tasks within the ADF.

ROBC Module 2

WO2 Brett Matthews

The ROBC's Module 2 (Construction) was delivered by the wing to 36 trainees through the period 12 Feb – 09 Mar, with the emphasis on Construction Management for TP Commanders and FLG Officers. The course focused on the management of Military construction operations, together with an appreciation of the CPL and SGT's roles within a Troop/Flight and the theory of structural and civil engineering.

The course trainees conducted a range of construction training from survey tasks to placing and finishing a concrete pathway adjacent to the wing. Additionally, they produced and delivered a range of associated management documents, with commendable results. The conclusion of the course involved a NSW RMS site visit to compare and associate the civilian equivalent of construction management. Training concluded by applying theory concepts to practical tasks in the final culminating exercise (EX KOKODA), when trainees designed, planned, constructed maintained and defended a FOB.

The course was received very well by the trainees, who embraced the opportunity to learn new skills and talents that can be applied within their new appointments and careers, post-graduation.

Trainee Rehabilitation Wing

LT Maximilian Peek

The Trainee Rehabilitation Wing (TRW) facilitates the rehabilitation of Initial Employment Trainees (IET) suffering musculoskeletal injuries from every school in Army. From as far north as the Defence School of Intelligence in Queensland and as far south as the School of Catering in Victoria, TRW takes them all.

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 dollar facility was built adjacent to the Holsworthy Health Centre (HHC).

Due to the physical nature of musculoskeletal injuries the School of Infantry (SOI) has been TRW's largest user to date. However, as SOI is running below half strength, 2018 has been a low capacity year for TRW. From holding 78 trainees in November 2017 TRW is currently at 31, as at November 2018. This vast decrease that has allowed TRW staff to trial and implement several new procedures.

With a combination of military lessons, daily physiotherapy classes, twice daily PT and psychosocial activities TRW tries to balance physical and mental wellbeing of trainees. The staff experienced that due to the catastrophic thinking common to those suffering from physical

injury, mental injury was a frequent follower. 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 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. Additionally TRW ties in closely with SME and SOER to facilitate training. From daily socialising the Explosive Detection Dogs, supporting Catafalque parties to providing CBRNE medical role players, TRW trainees are kept quite busy amid their rehabilitation program.

So far 64 trainees have left TRW in 2018, 34 leaving to return to their original trade, 15 finding another trade and unfortunately, 15 being medically discharged.

With increasing knowledge of proper training techniques, pre-rehabilitation and a low capacity year from the Training Establishments the TRW staff, comprised of RAAMC, RAINF, RAOOC, RAEME and RAA foresee another year of continual refinement of trainee rehabilitation.

Littoral and Riverine Survey Squadron

MAJ Greg Spencer

2018 was a busy year for LRSS with a variety of Task Orders and support activities as well as farewelling two members who each gave 40 years of service.

Hydrographic and land survey work for the Amphibious Task Group

In December 2017 LRSS was tasked to undertake rapid environmental assessment of several ocean beaches south of Townshend Island at Shoalwater Bay. This task had to be completed no later than end of February 2018, in order to allow the Landing Helicopter Dock (LHD) HMAS Canberra to conduct amphibious landings in mid 2018.

35 Water Transport Squadron from the 10th Force Support Battalion Townsville, provided an LCM8 that LRSS utilised as a sea base for the task. The work was completed in less than a week, with the environmental conditions at Shoalwater Bay proving a noteworthy test for the squadron.

Equipment Trials

LRSS completed trials of an autonomous and remotely operated survey craft, procured under Army Innovation Day 2016. The craft is fitted with a multibeam echosounder and topographic LIDAR and is capable of mapping shallow water and the near-shore with centimetre accuracy. Trials have included surveys by day and night and launch and recovery from an LCM8. This capability was demonstrated at Autonomous Warrior 2018.

A high resolution portable multibeam echosounder, purchased by Army Headquarters as a capability development and risk reduction activity to support project LAND 1771, was also trialed. The multibeam echosounder is fitted to the current 7.5m survey vessels and greatly increases the productivity and efficiency of hydrographic data collection.

Support to Defence Science and Technology Group

LRSS was tasked to support Defence Science and Technology Group in the development of hyperspectral technology. In May, the Sqn deployed to the Wide Bay Training Area and in September to HMAS Creswell to geo-reference targets on land and in the water.

WBTA was chosen due to the difficult estuarine and foliage cover. In both activities the sqn proved its ability to adapt and deliver results in unique and technically challenging environments.

Fleet Base East berthing assessment for the LHDs

LRSS was asked to assist Fleet Base East in resolving the berthing of LHDs at berths 4 & 5. A team was deployed to collect data which allowed for the successful outcome of the wharf being certified for berthing of the LHDs.

Support to the NSW Australian Army Cadet Brigade

LRSS was asked to provide a military experience to 1,500 Cadets through a watermanship activity. The location was Lake St Clair 40km north of Singleton and the activity was conducted over a 6 day period, with support from elements of 5ER.

Rear: SPR Sangston, SPR Gilan, SPR Twiss, LCPL Odell, LCPL Doherty; 3rd row: CPL Mc Ewan, SPR Quinn, LCPL Anderson; 2nd row: CPL Childs, SPR Laxton, SPR Shipper, SGT Baker, CPL Eilerson; Front: WO1 Van Etten, WO2 Keays, MAJ Spencer, CAPT Riley, SGT Capaldi.

The response from Cadets identified this experience as resounding success and the response from adult staff brought many positive comments about Cadets overcoming physical and social challenges as well as complimenting the ADF members conducting the activity.

Retiring members 40 years for both

This year LRSS farewelled CAPT Tony Nusco Army's most senior hydrographer and WO1 Adrian Markson a senior surveyor. These two stalwarts of the unit, each with over 40 years' experience, served with distinction throughout their careers in the ARES.

They remain an inspiration to many who followed in their footsteps. Both Tony and Adrian were, for many years, the back bone of LRSS. Without their drive, determination, technical skills and leadership the unit may not have survived.

Over the years they passed on their knowledge and grew the experience of the next generation of hydrographic and land surveyors. LRSS can now, move with confidence into a new era of littoral geospatial information and engineer intelligence.

This may be the last contribution LRSS makes to the Sapper Magazine as a sub unit of the School of Military Engineering, is at is probable that 2019 will generate a change of command, with a move to the Amphibious Task Group. Our time at the School of Military Engineering has proven to be a noteworthy chapter in the history of the Squadron with the broader engineer community expanding their understanding of littoral geospatial information and littoral engineer intelligence. On behalf of Squadron I would like to thank the School of Military Engineering for the support over the past 3 years.

Royal Australian Engineers Freedom of Entry Parade - Liverpool City

LT Jacob Nicholson

On Sunday, 04 Nov 18, the City of Liverpool re-affirmed Freedom of Entry for the Royal Australian Engineers, which was originally granted to the Corps in 1959, in recognition of the long relationship between Liverpool and RAE.

Led by CO/CI SME, LTCOL Dave Evans, around 150 soldiers formed up at Bigge Park Parade Ground – watched by a large crowd of family, friends and local community members – to be bestowed the historic honour by the Mayor of the Liverpool City Council, Councillor Wendy Waller.

Councillor Waller spoke of the privilege of bestowing the award in the light of the Centenary of Armistice, and that her community welcomes Army today, and in to the future.

Right page: CO/CI SME leading the Freedom of Entry parade through the streets of Liverpool

Below: CO/CI SME, COFS HQFORCOMD and Councillor Wendy Waller

"The Royal Australian Engineers, or Sappers as we are colloquially known, have a long standing relationship with the City of Liverpool" LTCOL Evans said.

"Having first established a footprint in the area in 1939 and raising the School of Military Engineering on its former site on Moorebank Avenue, Casula in 1940... Over the past 78 years the School has been charged with Training and Educating our young Engineer Officers and Soldiers prior to them joining an Engineer Unit. As a result every serving Sapper has called SME, and thus in turn Liverpool, Home for a period of their careers. Whether that period was a few months or a few years, we and our families have always been warmly welcomed into the local Schools and Community... This is truly a unique privilege to be afforded to RAE and one that I believe recognises the close relationship the Army has enjoyed with the Liverpool community since our arrival in 1959."

Chief of Staff Headquarters Forces Command, Brig John Carey CSC, hosted the parade and the official guest was Brig Michael Bond CSC and bar, Commander 5th Brigade.

Councillor Waller joined Brig Bond and Brig Carey to inspect the parade before the soldiers began the march through the streets of Liverpool to exercise their right of Freedom of Entry.

Supported by members of the Local NSW Police Service and members of the Australian Army Band Sydney, the soldiers marched from Bigge Park along Bigge Street and George Street, where a large crowd lined the street to witness the Challenge to be conducted on the steps of the Liverpool Court House. Superintendent Allan Whyle of the NSW Police provided the traditional Freedom of Entry Challenge, before granting the parade symbolic access to the city for the second time in 60 years.

The Freedom of Entry was also part of the 'Liverpool Remembers' celebration held throughout November in honor of the Centenary of Armistice. SME, and members of 5 Brigade provided a catafalque party to the memorial service held at the Bigge Park Memorial, as well as maintaining an ongoing community engagement.

[**RAE Exercises**]

Army Aboriginal Community Assistance Program (AACAP)

LT Nicholas Bunting

The Army Aboriginal Community Assistance Program (AACAP) provides an excellent training platform to prepare for an extended deployment of a task-organised Squadron Group. The technical complexity and remoteness is representative of likely construction tasks to be undertaken on operations, such as construction of an intermediate staging base or other nodal infrastructure.

Above: The Yalata boomerang at the entrance to the township for AACAP 2018.

Below: The Yalata community staff house was constructed by the Construction Troop Trade Section. The construction task was also supported by members of SME and the Tongan Contingent.

AACAP 2018 took place in the Aboriginal Community of Yalata, approximately 250km west of Ceduna in South Australia. Along with support from 2 GHB, 9 FSB, 10 FSB, SME and 2 DIV units, the 17th Construction Squadron delivered construction, training and health effects to the community over the four month exercise. During this time, the contingent was also supported by military engineers from Papua New Guinea and Tonga.

At the start of May 2018, the Advance Party deployed for three weeks and established a 150 man camp to accommodate the contingent for the duration of the exercise. This phase of the exercise provided critical training and experience in establishing the tactical infrastructure required to support the lodgement of a force into an operational environment.

The construction line of effort consisted primarily of three scope items:

- a 1.2km sealed road
- community staff house
- enhancement of the local caravan park.

Each of these scope items was individually commanded by a JNCO Foreman, requiring strong leadership and technical competence to ensure successful completion. The three sites were managed under the single Construction Troop Headquarters.

Above: SPR Dayman from Resources Troop screeding the new footpath that now provides access to the local medical facility.

Below: The 17th Construction Squadron took delivery of two new MAN dump trucks whilst on AACAP 2018. The new vehicles offer greater capability including increased pay load, additional comfort, increased speed and ease of operation.

The sealed road was constructed from locally won material and underwent extensive quality control testing implemented by the Squadron Works Office and Soils Technician. The road construction was an excellent demonstration of the type of theatre mobility support that 6 ESR can provide. Similarly, the caravan park construction works illustrates the methods in which essential services would be installed and integrated into semi-permanent infrastructure such as within an FOB or FSG on operations.

The construction of the staff house was a significant achievement for the tradesman who displayed admirable initiative and flexibility to ensure that the construction timeline was met without compromising quality. This project exercised the full range of trades within the Squadron, providing effective training for the construction of permanent infrastructure likely to be executed in the final phases of an operational campaign.

Across all lines of effort, AACAP 2018 was a great success for the 17th Construction Squadron, its supporting attachments and the local community of Yalata. It reinforced the skills in planning and execution that enable 6 ESR to provide theatre level engineering support and highlighted the capability that is generated through the strong leadership and technical proficiency of our Junior Leaders.

[**RAE Exercises**]

Ex PUKPUK 18
25 Support Squadron

CAPT Joseph Colley

2018 saw 25 SPT SQN and PNGDF Engineer BN form PUKPUK SQN and once again journey to the North Coast of Papua New Guinea in support of 3 BDE's EX OLGETTA WARRIOR, where the heat, humidity and beauty all rival a glorious Townsville summer. This year the SQN saw attachments from both the RAAF and Navy as well as our reservist brethren fall under the command of the OC MAJ Chris Kukas. The contingent included a total of 103 personnel from four brigades, with 23 different ECNs working to make such a complex Exercise so successful. A total of 131 PNGDF participated in the activity including engineers from 3 CER's PNG counterparts; Engineer Battalion, a small contingent from the Force Support Battalion and our generous hosts at Moem Barracks, the 2nd Battalion, Royal Pacific Islands Regiment.

On 15 August 2018, 21 personnel deployed as an advance party to set the conditions for the main body's arrival. This included the installation of a demountable kitchen, laundry and ablutions, installation of underground electrical and plumbing services, establishment of the camp mess hall tent as well as the construction of the contingent's sleeping accommodation. The advance party was also responsible for receiving eight shipping containers of specialist stores and equipment and multiple vehicles required to conduct the exercise. Unfortunately for the advance party Murphy's Law was against them, with barges scheduled to deliver the equipment falling victim to break-downs and engine fires resulting in a delayed barge arriving a total of 13 days late. This forced the team to revert to old school construction methods including levelling formwork using string lines and digging footings through rock using crow bars and shovels. The team faced multiple complexities ranging from improvised plumbing and bathing solutions when Wewak's town water supply dried up, to a severe lack of specialist tooling as they were all located "in the container". As a testament to the soldiers of 3 CER, the advance party overcame many odds through 'Sappernuity', hard work and a fantastic attitude to achieve all the required tasks on time and enable the main body's insertion into PNG.

Following delays due to mechanical faults of the aircraft, the main body departed Australia and immediately commenced works. Now that the shipping containers had arrived, key construction elements could commence work under the guidance of the Project Management Team, consisting of the Construction Officer CAPT Callum Johnston (PUKPUK 18 Lead Planner) and Works Supervisor WO2 Daniel 'Chook' George. One of the key scope items was the construction of a 120-pers camp, 'Camp Hero' which was constructed to enable friendly units to lodge within Moem Barracks with minimal reliance on constricted logistics support. This camp consists of 13 powered accommodation rooms, two powered offices, an enclosed Q-store with armoury, a gym, fully functioning ablutions and laundry facility, enclosed kitchen with storage and an open dining facility. The camp included additional lockable storage for items such as tools and camp stores. The accommodation was constructed under the leadership and supervision of SPR Dale Johnston, whilst the dining facility was constructed under the supervision of CPL Jae Druett who was also the Advance Party senior foreman.

An Urban Operations Training Facility (UOTF) was constructed consisting of 18 modified shipping containers transformed into a complex urban village and market place. The village was enhanced through extensive paint, signage and fencing works as well as

PUK PUK Sqn 2018

the emplacement of abandoned cars within the area to add complexity. The UOTF was designed as a complex multi-user, multi-purpose facility not only to be used for kinetic operations but to facilitate engineer search and partnered RPNGC stability operations. The detail in design and quality of construction resulted in the UOTF offering a huge training benefit and opportunities to the PNGDF. The UOTF project was led by the site foreman LCPL Gavin Lawson who had a huge impact on the overall site layout and presentation.

In addition to the large infrastructure effort, a number of mentoring teams were deployed in order to achieve the main effort of the exercise, partnered generation of engineer capability. This saw the conduct of search training packages for 21 Assault Pioneers from 2 RPIR, led by Australian Combat Engineers and supported by the PNGDF Engineer Battalion. Further to this, watermanship and basic construction (refurbishment of the base obstacle course) were conducted with a combined workforce including 27 PNGDF personnel.

In Lae, a working group was headed by 3 CER, with support from BDE, developing a contingency force element to enable a structured response to natural disasters that occur regularly within the country. Further support saw three personnel from 3 CER assist Defence Cooperation Program staff deliver the first Engineer SUB4 SGT course in 12 years, rectifying a critical shortage of SNCOs within the PNG Engineer Corps.

Whilst 3 CER's primary focus is the generation of partnered Engineer capability, PUKPUK SQN also facilitated a number of courses for key support staff, including:

- the delivery of small engines operator maintenance training to 19 PNGDF members
- the delivery of outboard motor technical maintenance training to 14 PNGDF staff
- the delivery of multiple medical training programs to 71 PNGDF infantry staff.

This training was critical to ensuring the PNGDF can sustain themselves in isolation either deployed on operations along the PNG boarder or at home.

The Exercise concluded after eight weeks in country with the official opening of the facilities and a traditional Papua New Guinean "mumu" to accompany the formalities on Family Beach. Whilst the physical prowess of the facilities speak for themselves, when it comes to success of the exercise, no structure could truly reflect the hard work, commitment, positivity, banter and brilliant attitudes of the men and women who comprised PUKPUK SQN. The amount of blood (28 stitches worth), sweat (so much sweat) and (lack of) tears is a true testament to the character and high quality of our soldiers, from both within the Regiment and those key supporting elements.

Ex PUKPUK builds on the enduring relationship 3 CER and the Corps has established with our PNGDF ENG BN counterparts. The objectives of Ex PUKPUK were based around small teams aimed at growing the PNGDF ENG BN capability across a broad spectrum of ubiquitous engineer roles. These small teams were led by some of 3 CER's and 3 BDE's best leaders who delivered world class training while achieving numerous refurbishment and construction tasks. Ex PUKPUK represents a continuous investment in the training and development of partner capability within our region. It will continue to be one of the cornerstone exercises for 3 CER and 3 BDE into the future.

Below: PUK PUK Sqn FRT at the completion of a small engines course with the PNGDF

Bottom: Const troop and PNGDF integrating trade skills to construct a 100 man camp in WEWAK.

[**Sapper SITREP**]

1st Combat Engineer Regiment

LTCOL Barry Mulligan

The 1st Combat Engineer Regiment provides Combat Engineer, and limited specialist engineer support, to the 1st Brigade in order to meet Army's capability and preparedness requirements and protect Australia and our national interests. The Regiment is an important part of the 1st Combat Brigade and is based at Robertson Barracks, Darwin. The Regiment is currently in the Readying phase of the Force Generation Cycle (FGC) and is preparing to assume Ready commitments from Oct 2019. The Regiment is underpinned by the support of our families, friends, supporters and logistic and administrative staff and we appreciate their continuing support.

Regimental HQ (RHQ)

CAPT Lisa Garfield

The RHQ, inclusive of the Regimental Signals and Reconnaissance Sections, has been busy throughout 2018. RHQ coordinated mandatory training and EX GOANNA READY in Jan-Feb prior to the arrival of Tropical Cyclone Marcus (TC MARCUS) in mid-March which caused significant disruption to Darwin. Subsequently, 1 CER provided support to the local government during the response to TC MARCUS and, under direction from Bde HQ, all Squadrons deployed across Darwin and the suburbs to clear roads, clear debris from schools and public buildings and support the local councils. During the response to TC MARCUS RHQ provided control and coordination of the multiple tasks and ensured the squadrons received the logistical and planning support required to deal with their ever expanding list of tasks. It was a busy but rewarding time for the Regiment.

Throughout the year RHQ have participated in various internal and external exercises including EX HAMEL, EX CARBON PREDATOR and EX PRED RUN. During EX HAMEL RHQ provided engineer planning to the Divisional simulation activity, Observer Trainer support to 2 CER's Blue Forces Engineers and Logistics personnel and white role support to enable a wide variety of Brigade or exercise echelon functions. During EX CARBON PREDATOR RHQ participated in refresher training on the Staff Military Appreciation (SMAP) process as part of build-up training in preparation for readiness activities in 2019. RHQ coordinated the movement of the Regiment to the Cultana Training Area (CUTA) near Adelaide during EX PREDATOR RUN, supported Brigade command and control functions and a gap crossing scenario-training-exercise (STX).

The Regimental admin section, Unit welfare team and training staff have supported all Regimental activities throughout 2018. Routinely operating at short-notice the admin team make sure we are payed and administrated effectively, book travel and do a range of tasks which are critical to the success of the Regiment and our people. The unit welfare team protect the centre of gravity of our unit by promoting the morale and espirit de corps of our unit and the well-being of our families. The training team coordinate the development of individual and collective skills and develop the effectiveness of the Regiment. The efforts of these often unsung heroes are appreciated.

The Regimental Signals Section (RSS) is a critical part of the Regiment. The Combat Engineer Regiment operates across a dispersed battlespace and communications are critical to mission success. The RSS is currently being revitalised in order to more appropriately meet the current and future demands of the Regiment. Consequently, the RSS took part in a wide array of variety of activities in 2018 including Communications courses, a High-Frequency (HF) Training activity and communications support to Regt and Bde Military Skills competitions.

The RSS conducted a HF training activity in April at RAAF TINDAL where they established different types of antennas, and conducted HF calls during different times of the day using the Army's HF radio, the AN/PRC-150. The activity was a great success giving participants a better understanding of the Army's HF capability. The activity also reinforced the importance of this capability to the often dispersed CER and provided insights into the type of problems regularly encountered in the field environment. The standard of food at the RAAF TINDAL mess was also exceptional and, consequently, it is highly likely this event will be replicated at RAAF TINDAL again! The RSS sponsored a Specialist Combat Communication Course (SCCC) in May 2018 which provided formal and in-depth training on the in-service radio suite and in managing COMSEC material. The course panel was maximised

RHQ planning the Regiment's next operation

to permit the RSS, plus a few from the Regiment and Recon Section to attend the training. CAPT Wotton and CPL Ward's efforts sponsoring this course have greatly enhanced the Regiment's communications capability and subsequent SCCC will provide a basis for the generation and sustainment of the Regt communication capability into the future.

The RSS supported both the Brigade Military Skills Competition and the CO's challenge in August. The RSS supported the establishment of participant's radios, command posts and stand locationas and supported communications over a significant distance. The RSS efforts underpinned the success of the activity.

The Regimental Reconnaissance Section (RRS) are another important capability in the contested, dispersed and congested battlespace. Consequently, the RRS is also the focus of the Regiment's modernisation and revitalisation efforts. The RRS ensures our limited Engineer capabilities are employed at the right place, at the right time and to achieve the best effect.

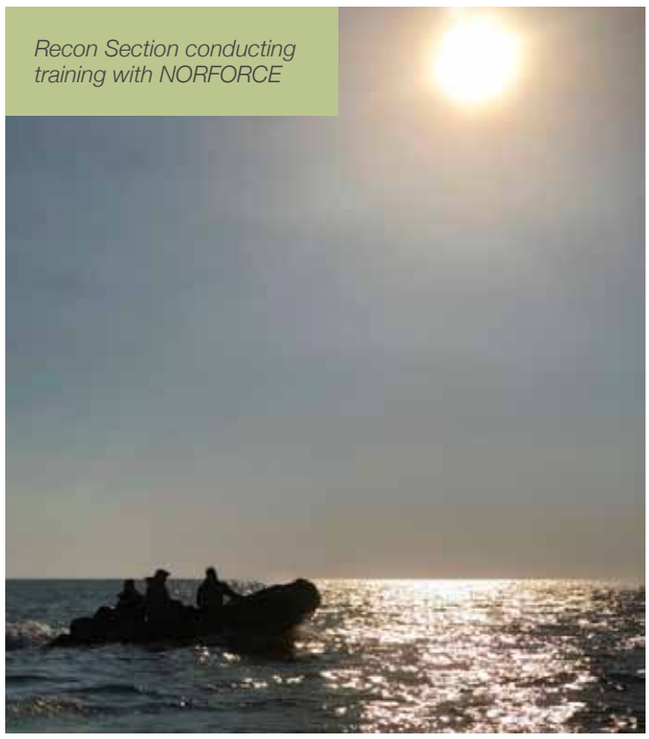
The RRS has had a busy year of emergency response, training and exercises. The RRS reinforced the Regiment during EX GOANNA READY, the response to TC MARCUS and during Brigade training activities. Furthermore, the RRS deployed to Arnhem Land with Darwin Squadron North-West Mobile Force (NORFORCE) in June to conduct community engagement in the Coburg region. The RRS provided mobility support to Darwin Squadron by clearing tracks and fire lanes and by transportation of troops across the Arafura Sea via Zodiacs to a variety of remote island communities. This exercise was but one of many exercises conducted with NORFORCE this year and strengthens the relationship between the Northern Territory based Regional Force Surveillance Unit (RFSU). The RRS is constantly developing its skills, modernising and seeking to improve its ability to support the Brigade and Regiment. The RRS is an important capability at it will also be a focus of unit operations in 2019.

Finally, the Transport Warrant, Section and Transport SGT have all been busy building the Regiment's driving capabilities in 2018 and the Regiment is well postured to support the introduction of the L121 fleet of vehicles.

1st Field Squadron (Motorised)

CAPT Timothy Potter

The 1st Field Squadron traces its lineage to the origins of the Australian Army. The Squadron continues to be custodians of the profession. The Squadron started 2018 as the Brigade and regions Emergency Support Force and almost made it through the cyclone season without a call out; however, this record was broken with the arrival of TC MARCUS in March 2018. Subsequently, the Squadron and the Squadron's junior leaders were at the forefront of the Regiment's response. The Squadron worked very hard during the response to TC MARCUS and, after a solid few weeks of restoring Darwin and surrounds to their pre-cyclone state, the Squadron switched targets to EX PREDATOR WALK 2018 which was conducted at



Recon Section conducting training with NORFORCE

the Mount Bundy Training Area (MBTA) approximately 2 hours from Darwin. During EX PRED WALK the Squadron embedded Combat Engineers into the Rifle Companies of the 5th Battalion, Royal Australian Regiment and administratively and logistically supported both live-fire and engineer specific training. The Squadron conducted bridging, chemical-nuclear and biological response and search training during EX PRED RUN.

1 Field Squadron underwent a significant transformation in July when 3 Troop was transferred to 9 Squadron in order to weight the Regiment's efforts supporting the Ready Battalion Group (RBG), prepare for the introduction of L8160 and to set conditions for the transformation of the Regiment's armoured capabilities linked to L400. 3 Troop has previously served within 9 Squadron and the change has been effective.

1 Field Squadron has championed the Regiment's efforts to integrate the Marine Rotational Force Darwin (MRF-D) throughout 2018. MRF-D personnel have been integrated into the majority of Squadron exercises, participated in the unit ANZAC Day celebrations and participated in unit sports. We have developed strong friendships which will last a lifetime.

1 Field Squadron has been at the forefront of the Brigade's chemical-nuclear and biological training in 2018. The Squadron has conducted revision training, integrated new equipment, supported Company level CBRND exercises and led Brigade revision packages. The Squadron is now trained in the light decontamination system and this has greatly enhanced the Brigade and Regiment's CBRND capability.

The Squadron capitalised on the 'dry season' by conducting a variety of local training activities including a tour of some adjacent units. Furthermore, several members of the Squadron have supported international-engagement and training activities in Timor, Indonesia and Bangladesh.

1 Fd Squadron is supporting EX PRED RUN at the time of writing. The Squadron is supporting the operations of motorised Combat Teams and executing CBRND training for approximately 600 members of the Brigade. Post EX PRED RUN the Squadron will return to Darwin and commence preparations for the handover of key appointments and equipment in Nov 18.

It has been a busy but rewarding year for the Squadron. However, the Squadron is proud to wear the Unit Citation for Gallantry, which was issued to recognise the actions of the Sappers at the Battle of Coral and Balmoral Fire Support Bases in 1968, and continue the Squadron's proud history.

9th Field Squadron (Mechanised)

MAJ Mike Smith

The 9th Field Squadron is the driving force behind the Regiment's efforts to support PLAN KEOGH, the Ready Battalion Group and the Regiment's contribution to the ADF's amphibious future. Consequently, the Squadron has been focussed on mechanisation, the remediation of the unit's dive capability and support to the 7th Battalion, The Royal Australian Regiment throughout 2018. The Squadron started the year in earnest with support to EX READY GOANNA and GOANNA SHOOT prior to transitioning our focus to a series of non-platform support tasks. The aforementioned tasks have been useful in they have supported the development of our individual and collective skills.

9 Squadron was heavily involved in the Regiment response to TC MARCUS and, with attached plant and RAAF personnel, conducted a wide array of chainsaw and debris removal tasks. The Squadron's efforts during this period were especially noteworthy as they were significantly understrength due to competing non-platform support tasks. The Squadron focussed their efforts on the suburbs surrounding

Left page: 1 Fd Sqn personnel during Tropical Cyclone Marcus cleanup.

This page from top: 5 Tp conducting MGB training; 9 Fd personnel during Ex PREDATOR ADVENTURE; 1 Fd Sqn personnel leading 1 Bde CBRN training during Ex PRED RUN.

Palmerston and the outskirts of Darwin and their efforts were appreciated by both the local residents and local councils.

During early March the Squadron participated in BOARS CRAWL in Cultana, South Australia. This exercise provided the squadron with their first opportunity to re-familiarise themselves with, train and fight from the M113 AS4. The Squadron capitalised on the skills and experience of the previously trained mechanised crews during this training. Concurrently, the Squadron training conducted CBRND and demolitions refresher training.

The Squadron returned to Darwin in April to participate in ANZAC day ceremonies, rest and undertake important maintenance efforts prior to returning to South Australia for EX PREDATOR WALK and PREDATOR ADVENTURE. EX PREDATORS WALK gave 5 TP the opportunity to operate mechanised in the field conducting construction tasks, demolitions in the preparation of a Battle Outpost, NEB construction and explosive breaching of protective obstacles in support of infantry platoons.

EX PREDATOR ADVENTURE allowed the Squadron to conduct roping adventure training. The activity was a welcome respite from the demands of Squadron training and provides participants with the opportunity to conduct activities which were unusual or outside the comfort zone of many.

The Squadron has championed the development of the Dive capability throughout 2018. Consequently, the Squadron has coordinated dive operations in the close-training area quarry, Darwin harbour and local waterways. Furthermore, the Squadron coordinated underwater demolitions training this year which was the first time this type of training had been conducted for several years. The training has set conditions for the Corps diving exercise which will be conducted in Nov 18. The development of the dive capability has been underpinned by the passion of our dive officer, dive teams and logistic staff who support our equipment.

The Squadron supported EX HAMEL with individual reinforcements and support staff in June-Jul 18. Subsequently, the Squadron was able to conduct Section and Troop training. The Squadron completed important Explosive Breaching, Shooting, MGB Build, watermanship and Dive activities during this period which all support the provision of engineer support to the Brigade.

The Squadron welcomed 3 Troop back in July 18 to ensure the Regiment is postured to support the Ready Battalion Group in 2019-20 and provide sufficient Armoured and Mechanised engineers in support of the Brigade's Battle Groups following the introduction of L8160 and L400. 3 Troop has a proud history in 9 Squadron, having served in the Squadron for several years during the 2000's, and it is pleasing to have 3 Troop back in the Squadron.

It was another significant year for the Squadron. However, a wide array of non platforms support requests, Combat Team training, engineer training and mechanised operations all served to rehearse the squadron in the essential basics prior to moving into the readying year.

The tyranny of distance has meant the Squadron has spent a lot of time away from home in 2018 and the support of our families is appreciated. We are looking forward to the challenges of 2019 and the assumption of Ready Battalion Group responsibilities.

23 Support Squadron

CAPT Jonathan Glover

23 Support Squadron (23 Spt Sqn) returned in Jan 18, having implemented it new structure to accommodate the introduction of new capabilities, to complete the final six months of the RESET Phase. The Squadron is now organised along trade lines to create efficiencies in individual & collective training and deliver an effective means to Raise, Train and Sustain capability bricks. The Squadron now has all Construction Trades (plant op, electrician, plumber and carpenter) in E31 Construction Troop; all Combat Engineers inclusive of Explosive Detection Dog Handlers in E32 Specialist Troop; and all Army Emergency Responders (AER) in E33 AER Tp. 23 Spt Sqn intended to start the year with EX GOANNA READY in order to focus on individual foundation war-fighting skills; however, those plans were quickly scrapped when TC MARCUS (category 2) passed directly over Darwin on 17 Mar 18. Subsequently, despite most buildings and infrastructure remaining undamaged; the Squadron spent the next few weeks clearing fallen and damaged trees from a number of regional schools. The Squadron, keen to assist the local community, took to this task with urgency and vigour that rapidly proved unsustainable, requiring the implementation of work/rest plans due to the wet season humidity and heat. It was a task well suited to

SGT Sharp and CPL Littleboy clearing up at Casuarina Secondary College

23 Support Squadron, given the Squadron's assets, including plant, tradespersons, combat engineers and emergency responders. The task took approximately two weeks and was an excellent chance to refresh and gain experience in chainsaw and tree felling operations as well as giving the plant operators plenty of work to do.

Throughout April-May the Squadron supported OP ATLAS – ADF's support to the Gold Coast Commonwealth Games. The Squadron provided several EDD teams who were attached to Brisbane's 2 CER where they conducted a number of security tasks including manning 24-hour vehicle search points at secure areas as well as helping QLD Police conduct venue searches prior to their use in the games. It was a great training opportunity and great opportunity to reinforce the Queensland and Federal Police.

The AER Troop, home to the newly categorised Combat Rescuers, has been busy throughout 2018 supporting the 1st Aviation Regiment and Brigade. The Troop routinely provides crash rescue support to Aviation operations and road crash rescue to the Brigade. The Emergency Responders are a critical and unique capability in the Brigade. The Troop introduced the new Stryker response vehicles this year and continues to develop its relationship with the NT Fire, Rescue and Emergency Services (NT FRES).

The Squadron has supported an array of plant and construction tasks throughout 2018. Plant operators have conducted road repair and damage control across both Mount Bundy and Cultana and the tradesmen have built and

expediently repaired a lot of vertical assets. The 'planties' constructed ~2000 metres of Anti-Tank Ditch in Sep 18 during EX PRED RUN and they have dug a multitude of defensive positions throughout 2018. It is envisaged, pending confirmation of secondment administration, the plant and vertical trades will gain training benefit from localised range developments in 2019.

The Squadron introduced the L155 Enhanced Bridging Capability in 2018 specifically focussed on the Dry Support Bridge (DSB). Consequently, 2 x Sections of engineers have now been trained in this capability and the Squadron is set to use the DSB during the READYING exercises in 2019.

The Squadron's main effort for 2018 has been EX HARI'I HAMUTUK 2018 (EX HH 18). EX HARI'I HAMUTUK is a multinational engineering exercise held in Timor Leste which is planned and executed annually by 1 CER. The Squadron conducted conduct reconnaissance, planning and construction material procurement for the exercise between Feb-Jul 18 resulting in 5 shipping containers of construction materials arriving into Timor Leste in Aug. The major construction task is a steel frame classroom located on Hera Naval Base which is being delivered in support of Government efforts to gift two Guardian Patrol Boats to the East Timorese Defence Force (F-FDTL).

EX HH 18 commenced in late August and all elements will return to Darwin and home-station locations in early October. 23 Spt Sqn (-) is deployed to EX HH and enabled by attachments including a Role 1 from 8 CHC, signallers from 1 CSR, caterers from 10 FSB and reinforcing tradespersons from

AER Tp assists NTFRS in Jun 18 by patrolling backburn perimeter

Spec Tp receiving DSB training

22 ER and SME. Additionally, the ADF contingent is reinforced by international participants from the Timorese forces (F-FDTL), US Marine Corps, US Navy and the Japanese Ground Self Defence Force. The major construction task is supported by Subject Matter Expertise Exchanges in plant operation, basic soils analysis, physical training, small engine maintenance, plant maintenance and surveying. EX HH will deliver infrastructure to the F-FDTL, enable skills & knowledge transfer and increase interoperability between nations.

The Squadron is well postured to head into the READYING phase of exercises in 2018 and remains poised to respond to contingencies within our primary operating environment.

Operational Support Squadron

LT Nigel Kent

The Operational Support Squadron (OSS) has seen some busy times throughout the "Reset" phase on the Road to Ready with some unexpected weather events to top it off.

OSS has facilitated the continued drawdown and receipt of LAND 121 MAN vehicles throughout the year at the same time supporting the transfer and disposal of equipment, primarily through PLAN KEOGH. As the SQN was gaining momentum towards conducting its initial shakeout exercise, it was interrupted by the arrival of TC Marcus in March.

TC Marcus saw OSS step up to ensure that Regiment's efforts to support the ESF and NT Government in returning Darwin to normality,

was done as effectively as possible. As would be expected following a Tropical Cyclone, resources and equipment were immediately put under strain whilst the entirety of the Regiment were working tirelessly towards cleaning up Darwin. Tech Support Troop's Fitters were suddenly inundated by a vast amount of unscheduled maintenance on chainsaws whilst Log Tp were busy sourcing stores and supplies to ensure that the Regiment and its equipment were sustained. During this time, some operator maintenance lessons were learnt by the Regiment, with the cleanest of chainsaws not necessarily correlating to the most serviceable in the long run.

The Squadron has been at the forefront of reformation and maintenance support within the Brigade this year. The Q store team has worked tirelessly to ensure the Regiment's maintenance and ammunition needs are met while concurrently supporting the introduction or removal of significant amounts of equipment. The workshops team has worked tirelessly to ensure our vehicle and equipment fleets are operational and met the requirement of every external audit conducted by independent assessors. The transport Section has supported the introduction of the L121 fleet and is now responsible for providing technical support to one of the largest fleets in the Brigade.

As 1 BDE begins its transition into the "Readying" phase, this has seen yet another flood of maintenance and supply requests as the Regiment prepares to deploy south to Cultana Training Area. The new MAN vehicles have brought significant challenge in the Road to Ready, with significant efforts placed on building the capability and skillset of SQN and Regiment members. Countless driving and maintenance courses were attended and supported by SQN members, ensuring that not just the Regiment but also other Units were ready for exercises in the future.

Overall it has been a busy year with a number of competing priorities always pulling staff in multiple directions with workloads for the SQN never diminishing throughout the year. The committed group of seniors and committed soldiers of the Squadron have been at the crux of ensuring that capability of the 1st CERt has been consistently maintained the through effective support of OSS.

Building relationships between ADF, US, JSDF and F-FDTL during Ex HARI'I HAMUTUK

[**Sapper SITREP**]

2nd Combat Engineer Regiment

LTCOL Rob Haertsch

Regimental Headquarters

LT Duane

After a busy start to 2018, 2 CER has continued to provide support to the 7th Combat Brigade (7 Cbt Bde) across a number of lines of effort. The Regiment commenced the year by mounting the Task Group 637.1 Headquarters element in support of the Commonwealth Games (Op ATLAS). During the middle of this year, the Regiment transitioned from the Readying to Ready Phase of the Force Generation Cycle. The Regiment actively participated in and provided engineer support to a number of key exercises culminating in Exercise HAMEL. 2 CER is set to maintain its high tempo into the first half of 2019 with the preparation for and support to both known and unknown operations. The remainder of the Ready Phase will be an exciting period prior to transitioning to the Reset Phase in July 2019.

2nd Combat Engineer Squadron

CAPT B Xenos

In 2018, 2 CE Sqn continued to focus on the generation of directed Contingency Force Elements (CONFE) in order to provide engineer enabling effects to the 7 Cbt Bde Ready Deployment Group (RDG). 2 CE Sqn was faced with the challenge of meeting the require Force Generation requirements for RDG, while concurrently tasked to generate a Combat Engineer Squadron for Op ATLAS, the ADF contribution to the Commonwealth Games 2018.

This duality of effort required the Sappers to transition from searching for simulated Anti-personnel mines in the challenging terrain of Canungra, to conducting Technical Low-Risk Search in Commonwealth Games venues. The Sqn supported the Queensland Police Service to conduct deliberate searches of the Games

venues in the Brisbane area. The operation proved to be an excellent opportunity to conduct multi-agency missions and gave the Sappers an opportunity to use technical search equipment to support their domestic search procedures. At the conclusion of Op ATLAS 2 CE Sqn switched its effort back to its Road to War in preparation for SEA SERIES and EXERCISE HAMEL.

2 CE Sqn has provided dedicated support to the 8/9 RAR Ready Battle Group (RBG) – Battle Group Ram. This has included forming the first rotational Ground Combat Element (GCE) with the Australian Amphibious Capability. 2 CE Sqn generated a Motorised and Airmobile Troop capability to integrate with 8/9 RAR's Combat Teams for the conduct of SEA SERIES 18. This saw the Sqn progress through a number of individual and collective Force Generation activities to realise its certification as an amphibious capable Force Element. The Sappers conducted Helicopter Underwater Escape Training, integrated onto the Landing Helicopter Dock (LHD) and participated in Wet and Dry Environmental Rehearsals (WADER) with Landing Craft and Helicopters. SEA SERIES culminated with the Battle Group Deploying ashore and conducting land operations supported by the LHD before transitioning to EXERCISE HAMEL.

The Sqn provided Mobility and Survivability Support to Battle Group Ram though EX HAMEL. This gave the Sqn an opportunity to put its CBRN capability to the test as 7 Cbt Bde faced a Chemical Munition threat. 2 CE Sqn employed Chemical Survey teams and the Light Weight Personnel Decontamination Station – Interim (LPDS) in support of an EOD Team tasked to Seal and Package a leaking Mustard artillery round. At the conclusion of EX HAMEL, 2 CE Sqn was certified as the Ready Engineer Force Element.

The Sqn has established the directed CONFE and has conducted further training exercises in particular training with the Improved Ribbon Bridge and BEPB Mk 2 at Wide Bay Training Area as these systems are introduced into service. The Sqn also facilitated Troop level exercises focusing on CBRN, Search and Infantry Minor Tactics while incorporating complex human terrain which generated an interactive scenario for the Troop Commanders to plan with and challenged the Sappers to not only focus on their individual skills but engage with an unconventional stakeholder group.

As 2018 draws to a close the Sqn has commenced OPGEN activities to prepare a High Risk Search Troop to Support Op APEC ASSIST, The Australian Government Support to the Asia-Pacific Economic Cooperation (APEC) Leaders Meeting, which is to be conducted in Papua New Guinea. This has given the Sqn an opportunity to combine the skills learnt through Op ATLAS and SEA SERIES. Concurrently, the Sqn will maintain other directed CONFE commitments into the Christmas Period and into 2019.

7 Combat Engineer Squadron

MAJ Matt Pesce

7 CE Sqn commenced 2018 with the challenge of generating a Combat Engineer Squadron in support of Op ATLAS whilst concurrently preparing to support 2/14 Light Horse Regiment as part of its road to war in preparation for EXERCISE HAMEL.

7 CE Sqn was tasked to provide a Low Risk Search capability to the Commonwealth games in support of the Queensland Police Service. The operation provided an excellent opportunity to conduct multi-agency mission sets and enhanced the Sappers ability

to utilise technical search equipment in support of domestic search procedures.

The Sqn quickly established within its forward staging area at Southport, and began search operations at the Athletes Village on the evening of 9 March and concluded its final search task on 19 April. During this time, 12 individual locations were searched, including a number of planned tasks requiring several days to complete.

Several dignitaries attended the Southport depot but the most notable and memorable would be the visit by The Governor General, His Excellency General Sir Peter Cosgrove. Op ATLAS provided valuable experience and exposure to domestic search activities that developed the Sqn and its interoperability with interagency stakeholders. The operation also allowed the younger Sappers of the Sqn to integrate into their respective Sections and commence battle procedure in preparation for EX Diamond Strike at Shoalwater Bay Training Area.

After a short but well deserved break it was straight into EX DIAMOND STRIKE in preparation for EXERCISE HAMEL. The culmination activity for EX DIAMOND STRIKE in support of 2/14 LHR was a complex LFX involving multiple platforms, often firing simultaneously and included a US Marine Coy comprising over 200 marines supported by a heavy weapons Platoon.

7 CE Sqn supported the LFX with BNS serials which took three days to prepare at three separate locations, and resulted in 204 individual charges including two mini nukes being fired over a seven hour period. This activity alone provided a worthwhile technical and logistical challenge for the Sqn.

On completion of EX DIAMOND STRIKE, the Sqn was advised of its commitment to support Op AUGURY until December 2018. This would involve three distinct deployments of 16 personnel per rotation. The initial training team was heavily involved in training the Soldiers and Marines of the Armed Forces of the Philippines (AFoP) in Search and Urban breaching techniques.

Training techniques would focus on various methods of explosive entry (MoE) on a wide variety of targets from hollow doors to solid walls. The work was extremely interesting and largely focused at the JNCO level. During the first training team rotation, the Sqn training team noticed several AFoP Infantry Battalions were required to grow their own rice in order to sustain their soldiers. For those who desire an OP AUGURY rotation, learn to love singing Karaoke in public, dancing strangely (Peter Garret style is highly acceptable) and eating strange and exotic foods not limited to roast dog, deep fried frogs and Balute eggs.

Overall, Op AUGURY provided an excellent opportunity to train with a foreign military whilst providing a platform in which to develop our own soldiers and JNCOs in ways not possible within the confines of Australia. It also served a wider purpose by exposing the hardships of service experienced by other nations to the junior members of the Sqn.

Whilst 13 Troop deployed on Op AUGURY Rotation 1, the remainder of the Sqn deployed to Wide Bay Training Area as part of EX SAPPERS BRIDGE. As part of the Exercise, the Sqn was tasked to plan and execute watermanship training for both CE SQNs over a 2 week period. This provided an excellent opportunity for the Sappers of the Regt to conduct watermanship activities at section level utilizing zodiac boats in a tactical situation whilst enabling combat support rafting operations. Overall, the 2 week training exercise was well received. The Sqn was afforded the opportunity to develop and further enhance basic individual soldier skills in preparation for future combined arms training activities.

Finally, the 7 BDE Military Skills competition better known as ‘EX HYDRA’ comprised several international teams competing from a number of nations such as France, the US and PNG. 7 SQN provided the lion share of the Regt team and finished a very respectful 2nd overall position behind the 6 RAR team. The effort and professionalism of the SQN’s junior Sappers

and JNCOs was highlighted by a number of the international teams bringing great credit on 2 CER

24 Support Squadron

CAPT S Sheldon

In 2018, 24 Support Squadron (24 SPT SQN) focused on two key actions, the generation and preparedness of 7 Cbt Bde Contingency Force Elements and support to operations. Key highlights include, but are not limited to: the development and integration of CBRN and All Corp Search training to over 2,000 solders to meet training shortfalls for the Ready Deployment Group and OP ATLAS respectively; deployment of a Specialist Engineer Section to RCB 123 and Trade Support to OP APEC ASSIST and TAJI. A more detail description of key contributions are outlined in the TP SITREPs provided below.

Construction Troop

Construction Troop started the year with support to OP ATLAS enabling camp setup, additionally the plant operators provided support to the EDD teams as No. 2 searchers. A quick transition saw the troop orientate to IJLS where plant took to both the ocean and land in support of the 7 BDE certification exercise. This saw the development of an FOB with services proving the capability that a combined Construction TP bring to the Combat BDE.

EX HAMEL then saw the devious side of the troop come out in the execution of deception measures where CSSB tried to draw water from a deception Water Point and our dummy tanks secured the flanks. CONST Sect touched up on its Combat Engineer skills supporting the REGT reserve. Plant assets provided the much needed support to the Combat BDE providing SURV, MOB and CMOB support, where it was most needed, demonstrating the capabilities the Troop brings to the Combat BDE.

Upon conclusion of EX HAMEL, eager members of the troop deployed on RCB123 in support of 8/9 RAR to improve their infantry skills and learn urban combat techniques. Carpenters and an electrician provided support to 6 ESR as part of the OP APEC ASSIST contingent constructing a HQ in PNG; the soldiers involved with support the month long retrofit of an existing building and construction of ablution block. The Troop assisted Navy's effort to provide construction support to PNG as a part of local partnerships, providing essential subject matter expertise through a recon and advisory team.

Nearer to home, we continue to develop our Plant Training Area, foster better relations with our partner units providing trade support, where possible and develop ourselves through tough training. As the year draws to a close, we remain ready to support the RDG and HRWS, providing plant and trade effects at short notice where it really matters. Construction Troop will continue to embrace the challenges which next year will bring with the restructure of the Troop and the support to 2 CER's operational Tempo.

Specialist Engineer Troop

The road to ready marked a big year for Specialist Troop (SPEC TP). In late 2017, the Route Clearance Package (RCP) joined the WPDS and EDD Section bringing the total specialist engineer tasks that SPEC TP maintain to three. Comprising of three individual specialist engineer tasks SPEC TP was called on to provide support to a number of operational and training activities in line with 2 CER becoming the 'Ready' Engineer Regiment. The start of the year saw the conduct of OP ATLAS ISO of the Government contribution to the 2018 Commonwealth Games, SPEC TP provided two key functions consisting of the training of 380 All Corps Searchers from across the ADF. The EDD section provided a number of EDD teams (EDDTs) that supported the conduct of venue searches, as well as Vehicle Search Points. At the height of the Commonwealth Games, 18 EDDTs from RAE, the RAAF and NZDF supported the conduct of low risk search during the period of the games. These two roles were critical for the conduct of OP ATLAS as it provided the essential capability to enable the safe conduct of the commonwealth games.

2 section at Shoalwater Bay, Glenn Airfield.

After the conclusion of OP ATLAS, SPEC TP stepped straight into training for the 'Integrated Joint Land Series' (IJLS). This saw the EDD Section split into four separate EDDT's to provide an additional layer of search capability to the four CE TPs. The RCP Section conducted mounted route search with SPT from 5 ER dismounted searchers IOT develop functional TTPs prior to EX HAMEL 18. Resources (RES) section provided sustainability support through the production and distribution of potable water to the 7th Combat Bde (7 Cbt Bde). This exercise provided an excellent opportunity to refine SOP's within the TP and enable effective integration for future training activities.

EX HAMEL 18 saw the implementation of the refined SOPs and TTPs for SPEC TP, RES Section and RCP Section became part of the REGT Engineer Reserve enabling the conduct of short notice tasks ISO the Bde scheme manoeuvre. RES Section provided the reserve section to 2 CER providing responsive engineer capability to the battlespace. RCP provided mobility support to the 7th Combat Bde during large logistic moves as well as being re-rolled to conduct low risk search.

Overall 2018 has been a very busy and productive year for SPEC TP with a wide variety of roles and tasks being conducted ISO 2 CER and 7 Cbt Bde.

Emergency Responder Troop

2018 has been a very busy year for the Emergency Response Troop (ER TP) at 2 CER.

The year kicked off rapidly with the Emergency Response Troop transitioning into a dedicated QRF Search Troop in support of the 2018 Commonwealth Games, on the Gold Coast. The Troop provided all corps search skills, in addition to working at heights and confined space rescue, IOT ensure the safe conduct of the games.

Upon conclusion of the games, there was a rapid shift IOT get the Troop back into a field mindset with the road to HAMEL fast approaching. An ER Det was detached ISO BG Pegasus on HMAS Adelaide, operating 24HR flying ops and the remainder of the Troop deployed into Shoalwater Bay Training Area for the IJLS and EX HAMEL. This was the first time in 2 CER ER Troops history that an entire Troop would be deployed into the field environment supporting a single activity. It was an excellent test of our equipment, personnel, and training.

Emergency Response Troop's 2 Section spent June positioned at Shoalwater Bay's 'Glenn Airfield' supporting the 1st and 5th Aviation Regiments. 2 Section were tasked with providing category 4 airfield coverage to the aerodrome; providing response to any crashed air frames, bushfires, fuel engulfment, hazardous material spills, road accidents and aero medical evacuations of the local area.

With 'Plan Beersheba' coming to effect throughout the 7 Cbt Bde, Exercise Hamel brought new challenges; in particular the way in which hard targets still required the dependable soft extrication of allied personnel. To counter this new test of SOP's, 2 CER's Emergency Responders were supplied with 'K950 demolition saws' which were repurposed to expose vulnerabilities in armoured door hinges and hatches enabling extraction of entrapped or unconscious casualties.

Emergency Response Troop.

This Exercise was a welcome chance to familiarise and train with the new Multi Roll Helicopter (MRH-90) and Army Reconnaissance Helicopter (ARH) and we took the opportunity to train with 5 AVN to practice winching, AME scenarios, response drills to the local Kurbside Refuel Point (KRP) as well as daily timed reactions around the aerodrome.

1 Section operated as part of the Engineer Reserve creating a rescue capability to be utilised by 7 Cbt Bde ISO land forces and integrated into the Battlefield Clearance Team (BCT).

With no casualties reported and quality time spent training on airframes, Exercise Hamel 2018 marked as a success for Emergency Response Troop and delivered a chance to further develop an armoured extraction capability for Forces Command.

Operational Support Squadron

CAPT S Liowillie

Integral logistic support to 2 CER for 2018 commenced well before the New Year firework display had even been lit. This saw the Operational Support Squadron, 2 CER's integral logistic squadron, supporting readiness activities in the lead up to the road to EX HAMEL as well as running the CSST for TG637.1 for OP ATLAS concurrently.

OSS staffed the CSST HQ for OP ATLAS which supported six company sized Task Elements as well as additional FEs scattered across SE QLD. OSS generated the CSST with attachments from 7 CSSB, 10 FSB and 2 GHB to provide logistic support to over 900 personnel and 16 Explosive Detection Dogs, from four staging bases, to over 15 games venues on 24 hour operations. The CSST was pivotal in TG637's mission success as the synchronisation of stores and equipment, transport, catering and health functions for such a complex scheme of manoeuvre in a Joint-Interagency environment. The team gelled immediately, working well to allow for a smooth execution of logistic and life support functions to meet the intent of CO TG637.1 in supporting Queensland Police Service and provide a safe environment the Gold Coast Commonwealth Games 2018. All those involved in the supporting OP ATLAS excelled, showing true grit and dedication to serve on this domestic operation. In particular LT Faulder, the Logistic Troop Commander admirably stepped up as the QRF Commander for the entire JTF.

Whilst drawing down from Op ATLAS, OSS maintained the pedal to the metal and swerving hard right into the ISLS 18 starting with EX DIAMOND STORM. With minimal time to prepare, the Regt was all hands on deck with understaffed Main-Q and TST being tested to breaking point attempting to concurrently demount from OP ATLAS, conduct unit battle procedure for foundation warfighting and prepare our own equipment. Credit to the TQ, WO2 Andy Crompton who enabled the Main-Q to meet the requirements of enabling 2 CER to deploy to SWBTA with all the bells and whistles. Having the majority of the Main-Q staff being junior ranks with little experience in the field, it was a great team effort by Logistic Troop to bring the Sqn, let alone the entire Regt, up to scratch for certification on the ISLS 18 and HAMEL 18 exercises.

Whilst on the IJLS 18, TST deployed the entire workshop and were able to test the flexibility and capability of their new Protected Mobility General Maintenance Vehicle (PMGMV) and Medium Workshop Shelters on the back of the new 40M MAN vehicles. Having the entire workshop deployed in the field for IJLS 18 and HAMEL 18, allowed for the rapid maintenance and repair of 2 CER equipment, a large number of which were also on the Bde MEEL. Not only did they overcome a number of hurdles dealing with the new fleet as well as the legacy fleet, they were also integral in providing SME advice regarding the broad holding of specialty equipment.

Having successfully supported the unit through OP ATLAS and into READY, OSS has been busy running driver courses, maintaining unit equipment and organising the vast amounts of equipment needed to support the Engineering Task Group and the various operations for the remainder of 2018.

As the end of the year fast approaches, the workload remains constant. OSS will see a large number of key appointment changes coming into the new year and will look to farewell those posting out of 2 CER OSS. OSS has been a great example of 'logistics just happens' this year, with the number of different exercises and operations that 2 CER has been on the hook for, the forever changing plans to adapt to the complex environments, OSS has always delivered the goods to empower the Sappers to lead the way.

[**Sapper SITREP**]

3rd Combat Engineer Regiment

LTCOL Jennifer Harris, CSC
WO1 Damien Woolfe

As another year comes to a close and the men and women of the premier Engineer Regiment prepare for a well earned rest, it is prudent to reflect on the year that has been.... 2018 has seen the Regiment transition from a high tempo READY cycle to the RESET, providing us the opportunity to invest in our military engineer foundation. As I assumed command in 2017 I challenged the Regiment to lead the Corps in consolidating our intellectual foundation (CMETL and SOP), and as we handed the baton to the 2 CER in August I am confident our Army's Combat Engineer Regiments, and indeed the wider Corps are well placed to drive forward into an exciting future.

The year began with, the now regular, preparation for high risk weather events in Australia and our region. Multiple planning cycles culminated in the provision of engineering support to OP PACIFIC ASSIST in PNG. The group who deployed can be justly proud of their efforts and support to the humanitarian assistance and disaster relief (HADR) operation.

16 CE SQN lead Army's investment in the development of the Philippines Combat Engineer Capability. This has been essential to enabling the Armed Forces of the Philippines in countering extremist threat. Superior teamwork and interpersonal skills seem to make up the fabric of our people, without exception. This ability to build relationships, across boundaries, languages and cultures was further evident in the SQN's participation in Ex CROIX DU SUD supporting the French lead joint exercise of 11 nations in New Caledonia. As an asymmetric enemy 16 CE SQN challenged the READYING 7th Brigade on Ex HAMEL 18, exposing important lessons, that as an Army we must learn to succeed in the complex, contested battle space of the future.

Our support to Queensland Police Service and Gold Coast 2018 Commonwealth Games Corporation (GOLDOC), providing a safe and secure Commonwealth Games in North Queensland exemplified our collegiate approach to interagency operations. 18 CE SQN seamlessly integrated into the GOLDOC Team enabling the Games in the North Queensland region. The SQN demonstrated the adaptability of the Regiment with their rapid transition from technical search operations to combined arms manoeuvre. Testament to their efforts is the robust relationship now established with the 3rd Battalion as part of Battle Group KAPYONG. Showcased in the catastrophic success they orchestrated as the OPFOR Battle Group on Ex HAMEL 18. In parallel they have restructured welcoming 17 TP, now 21 TP, back into the SQN, setting the foundation for mechanisation in anticipation of L400-3 and L8160.

The custodians of Brigade level engineering effects, 25 SQN, have balanced restructures, new capabilities and the evolution of Ex PUKPUK, the largest IE activity conducted by the 3rd Brigade in 2018. Supported by teams from across the Regiment, Brigade and FORCOMD they continue to build our relationship with the PNGDF Engineer Battalion. In addition I challenged them with establishing the 3rd Battle Group Engineer node in support of 2 CAV's Battle Group EAGLE. They have embraced this challenge and are well poised to test this partnership in the next READYING Cycle.

OSS has worked tirelessly in a year characterised by high tempo, competing priorities and staff absences. They have embraced technology to better enable CSS across the Regiment. They have been integral to the intense period of modernisation currently underway, integrating 3 new fleets, whilst simultaneously enabling our legacy vehicles. We are truly blessed with the caliber of our CSS specialists they have been fundamental to every success achieved by our team this year.

CPL Brien mentoring a trainee from 500th Engineers, AFoP during a route search task on Ex CARABAROO

16 Combat Engineer Squadron

CAPT Matthew Jones

2018 has been a high tempo, challenging and rewarding year for 16th Combat Engineering SQN. The SQN has had achieved success across a significant number of lines of effort throughout the calendar year. The SQN has had significant commitments to the Ready Battle Group (RBG), Ready Combat Team (RCT), Op AUGURY, Ex SSANGYONG, Ex CRUIX DE SUD (CDS), Ex CARABAROO and specific Engineer training throughout the year.

The RBG and RCT are the contingency force elements provided by the Ready Combat Brigade. 16 CES's commitment saw the entirety of the SQN on leave restrictions over the last Christmas and stand down period. Despite a number of periods on reduced NTM the soldiers of the SQN maintained a professional attitude towards this commitment. They exemplify the readiness culture of the 3rd Combat Engineer Regiment.

LCPL Namoa and his team of trainees from 500th Engineers, AFoP are pretty chuffed with the result of their breach on OP AUGURY

Op AUGURY commenced in the latter half of 2017 with the commitment from 16 CES continuing until July 2018. The operation was based in the Philippines and involved the deployment of Mobile Training Teams to facilitate specialised training of the Armed Forces of the Philippines (AFoP) in the wake of the Marawi siege. The Engineer commitment to the operation involved the running of a three week Urban Search and Breaching course that taught the basic search, EHAPT and demolitions principles. The relationships made during the operation were invaluable, so much so that the AFoP sent a contingent of soldiers over for the inaugural Ex CARABAROO.

Ex CARABAROO was a Tri-lateral exercise conducted in conjunction with 1 RAR. The exercise saw 3 CER train members of the 500th Engineers, AFoP in search and demolitions prior to integrating into a CT field exercise. The exercise was particularly valuable for 16 CE SQN and the AFoP contingent as we were able to extend and further progress the training in urban mobility they received on Op AUGURY.

16 CES contributed to a number of international engagement activities during the year. This included Ex SSANGYONG and Ex CRUIX DE SUD. Participation in these activities provided an excellent training opportunity for members of 16 CES to integrate their combat engineer skills with regional partners and gain exposure to foreign forces, how they train and operate.

2018 has seen the SQN downsize to the two TP CE SQN as part of Plan KEOGH. This marks an exciting time for the Regiment as it is the first step to developing an armoured engineer capability. Sadly this meant handing over command of 17 TP who will be missed as their contributions to the SQN were significant throughout the year. We wish them the best luck with their new identity as 21 TP at 18 CES.

This year has been busy yet rewarding for 16 CES both as a collective and individually. As the SQN transitions through the RESET and READYING phases of the FORGEN cycle next year it will continue to remain a lynchpin for 3 CER, providing world class Combat Engineering support to the Combat Brigade and Joint Force.

18 Combat Engineer Squadron

MAJ Orry Kirkham

2018 has been a high tempo and challenging year for 18 CE SQN, characterised by activities across the spectrum of operations, and capability development. The year commenced with Op ATLAS, the ADF's contribution to supporting the 2018 Commonwealth Games conducted primarily on the Gold Coast, but with events also occurring in Brisbane, Townsville and Cairns. 18 CE SQN constituted Task Group 637.2, and deployed elements in support of the Queensland Police Service in both Townsville and Cairns. Our work in conducting searches of competition venues and athlete accommodation was a crucial aspect of ensuring a safe and secure environment for the games to be conducted in.

With minimal time to rest and refit, the SQN deployed on Ex DINGO FURY in April, demonstrating its ability to rapidly transition from Defence Aid to the Civilian Community (DACC) to conventional warfighting operations. Here, the SQN practiced and confirmed its ubiquitous Combat Engineer skills; breaching, route search, tactical obstacle emplacement and vital asset protection, ensuring we were well prepared for the fast approaching Integrated Sea and Land Series.

The year continued to move at a rapid rate, and before we knew it, 22 CE TP was deploying on Ex SILICON DIAMOND as a part of Combat Team – Alpha, 3 RAR. This was a milestone moment, marking the commencement of the SQN's journey to mechanisation in M113AS4 APCs under Plan KEOGH. 22 CE TP provided exemplary support to CT-A in their role as the OPFOR CT for 7 Bde. Their focus was predominantly counter-mobility, establishing minefields to shape and inflict delay on the 7 Bde, and demonstrate the value of true combined arms integration.

LT Joseph Huston, 17 Troop coordinates an obstacle breach

Combat Engineer Divers practicing surface swimming and insertion techniques on Ex THUNDER RANGER

In June and July, all attention was focused on preparing for a complete SQN deployment on Ex HAMEL 18 in OPFOR roles. SHQ and 22 CE TP attached to BG KAPYONG, 3 RAR, and continued to build on the relationships established earlier in the year, providing conventional combat engineer support across mobility, counter-mobility and survivability tasks. 23 CE TP constituted an element of the Hybrid Force Combat Team ISO 16 CES providing an irregular and asymmetric training aid to challenge 7 Bde. The SQN's performance throughout this entirety of the Joint Warfighting Series was exceptional, and ensured valuable and realistic training could be delivered to our fellow sappers at 2 CER.

After a well-earnt period of leave, the SQN returned in August and got straight into receiving our first tranche of our own M113AS4 APC's, modernising the antiquated Army Work Diving (AWD) capability. We welcomed 17 TP, now 21 TP permanently into the SQN from 16 CE SQN. Ex THUNDER WARRIOR was the SQN's first opportunity to practice its specialist skills; 22 CE TP roamed around Townsville

SPRs from 17 Troop, 3 CER exploiting a find during Ex DINGO FURY, TFTA

Field Training Area in their new carriers, 23 CE TP practised new dive techniques and procedures, and 21 CE TP honed its support to dismounted infantry.

Back in barracks, the SQN Q-Store and Forward Repair Team (FRT) were busy managing the induction and maintenance requirements of the APC's and the new L121 vehicle suite. At the same time, the SQN's junior and senior NCO's were providing a constant flow of instructor support to SME, RMC-D and the Army Dive Wing. Less experienced soldiers ably stepped up in their absence, planning and conducting small team training into September and October. The exercise period culminated with 21 CE TP integrating a section into Combat Team – Bravo, 3 RAR, for their road to mechanisation and Ex GAUNTLET WARRIOR.

The SQN is well placed to continue the RESET phase of the FORGEN cycle into 2019. Providing combat engineer support to 3 RAR, mechanising and modernising the AWD capability will remain the SQN's main priorities when it returns from the stand down period.

As OC, I have asked a lot of 18 CE SQN in 2018. New roles, new supporting relationships, new equipment and new vehicles. In most cases, the corporate knowledge for new equipment and vehicles has not previously existed within 3 CER, and soldiers have been challenged to learn and develop their understanding in the absence of formal training or qualifications. Soldiers and officers have willingly stepped up without hesitation to achieve what I have asked.

25 Support Squadron

LT Jade Pregelj

25 SPT SQN has seen many people, equipment and capabilities come and go – it is an ever evolving SQN, and this year has seen the most momentous change in recent times. 2018 started like any other year for 25 SPT SQN with a changing of the guard and the start of a new era. The SQN has been quick to adapt with a new icon which will carry it forward into the future.

As is custom, the new-year saw new bright-eyed TP commanders front loaded with the traditional scramble in support of multiple HADR events. Cyclone Gita kept the SQN on its toes primed at the start line, while the earthquake that struck Papua New Guinea on 26 February triggered LT Newland and SGT Thomas to lead a combined 25 SPT SQN TP into the PNG Highlands on Op PNG ASSIST.

Back in Townsville, SPEC TP battled to get one WPDS unit working, CONST TP remodeled a vehicle hanger using a PC50 and ER TP were stretched thin supporting 16 CE SQN in reinstituting the BDE's literacy in CBRN. Concurrently, planning for Op ATLAS was well underway. 25 SPT SQN provided all EDD Teams, to assist 18 CE SQN in their mission to support the 2018 Commonwealth Games events in North Queensland.

Ex DINGO FURY was looming on the horizon post OP ATLAS and Easter RTP. A little something different this year for 25 as the SQN focused on their individual TP capabilities, ensuring the execution of specialist skills early in the year in order to guarantee and increase individual and team competencies.

25 SPT SQN was vital to the execution of Ex SOUTHERN JACKAROO in May this year. Ex SOUTHERN JACKAROO, a multinational exercise saw 25 SPT SQN coordinate a Combat Team Defensive STX LANE at TFTA. SHQ conducted

The newly constructed EDD training facility at MSTA, a key achievement of CONST TP this year.

the planning and coordination while LT Pregelj commanded the 'Peer Adversary Party' as part of the four stand exercise which culminated in a live fire component. Over a four day period, Combat Teams from the Japanese Ground Self Defence Force, US Marines, US Army (supported by 2 CAV) and 1 RAR rotated through the defensive position dug by Construction TP's finest.

2018 was a demanding and productive year for a niche capability, the Explosive Detection Dogs. The EDD Teams support to OP ATLAS was followed by the 2018 EDD Integration Trial, where EDD Teams were attached to 16 and 18 CE SQNs and then consolidated under SPEC TP 25 SPT SQN in an effort to assess various integration methods. The trial served to inform the future structures and integration opportunities that will be essential to development of the specialist EDD capability.

The most exciting news for the EDD Section this year was the greatly anticipated completion of the EDD Buried Hide Facility infrastructure at MSTA. This is the most significant milestone to date in the long history of the project. A solid effort by CPL Wrigley and his team from CONST TP and ER TP enabled the works which built on the solid foundations set by previous SQN staff.

In September, CPL Ian Moss headed the EDD MTT to Malaysia focusing on specialist search and EDD training with the Malaysian Army Dog Wing in Pulada, strengthening the Malaysian Armed Forces specialist capability and building partner capacity in this important capability.

Ex PUK PUK 18, the 3rd Brigade's largest International Engagement Exercise is traditionally identified as the annual main event for 25 SPT SQN due to the relentless planning, coordinating, liaising and resourcing, this year led by CAPT Johnston and SGT Harris. The exercise, conducted from September to October on Moem Barracks, Wewak, Papua New Guinea, was an undisputed success.

CONST TP has evolved into a combined horizontal and vertical construction TP under Plan KEOGH which has seen the reduction of the vertical trade elements within the CER structure. The TP has embraced this challenge including the upskilling of a hybrid, vertical and horizontal construction capability to maintain support to the Combat BDE.

SPEC TP also led the IIS of the Land 155 Dry Support Bridge (DSB) with a number of members conducting the suite of courses required to operate this new capability during Army Land Trial 2 2018 . In 2019 SPEC TP will continue to maintain their essential specialist capabilities with the newest toy in the toy box which will undoubtedly be a focal point in coming Bde exercises.

The Phillipine Army welcomes members of 3 CER, OP AUGURY.

ER TP has not escaped the intense period of change upon the SQN. As the future of the Emergency Responder role is explored and refined, the operators and sharp personalities up the hill remain poised to adapt. ER TP's continued relationship with 5 AVN saw the team move forward together, developing an Aero-Medical capability with the Chinooks during Ex DINGO FURY 18. In line with this, and as ER is transitioning towards the new Combat Rescue Fire fighting role. The TP have been in deep planning and preparation for imminent tasks to support 5 AVN in 2019. The conduct of specialist rescue courses through civilian agencies and the acquisition of an MRH frame mockup have enhanced the TP's opportunities for capability development.

Operational Support Squadron

CAPT Ben Carruthers
CAPT Alexander Johnston

The 'Ready' phase of the FGC has been a busy one and after the initial yearly induction training the SQN soon deployed on EX DINGO FURY to conduct a SQN shakeout exercise with RHQ oversight. For many within OSS this was the first time in a field environment but they soon managed to get into the routine and provide much needed logistic support to the other SQNs.

This year has seen the start of the Introduction into service of the LAND 121 Phase 3B Fleet of Vehicles (FOV). The Main Q yard has now turned into a vehicle park as they manage the receipt of new vehicles and equipment into the Regiment whilst trying to manage the disposals of legacy vehicles and equipment.

Whilst this has been occurring the SSM/ TOCWO is trying to meet the driver training requirements of both the new and old fleets. Those members that have managed to conduct conversion training at RAAF Amberley have been really impressed with the capability of the new fleet. Next year will see the SQN deploy into a field environment with the new fleet of vehicles which will allow us to test and adjust our TTPs.

One of the main highlights this year was EX ATLAS WARRIOR, a section based exercise over five days that allowed the SQN to bond across its functional areas and built on small team cohesion. Another major milestone this year was the successful completion of an ACAU inspection. All functional areas were inspected and although the unit incurred some CARs, as expected, we can all walk tall and proud that the logistic support provided to 3 CER has been both professional and effective throughout 2018.

'Reset' within the FGC does not mean that we can relax and enjoy the niceties of FNQ. Conversely as the High Risk Weather Season approaches, CO HO/ TO stock takes, LAND Trials, and continued issue of L121 FOV and equipment OSS cannot afford to take our collective foot off the gas! Safe soldiering and remember logistics just happens!

Conclusion

2018 has also seen a number of the Regiment's stand out members recognised for their actions and achievements through awards and commendations. Of particular note are the recipients of the 2018 RAE Excellence in Military Engineering awards, SPR Ryan Roach (now LCPL) and CPL Thomas Mondzheyovsky who were selected as the best SPR and JNCO from across the RAE. The Regiment would also like to take this opportunity to acknowledge the hard work and individual performances of CAPT Nick Price and SPR Dylan Booth for their commendations on OP AUGURY and LCPL Peter Gross, LCPL James Korosec and SPR Thomas Page for their soldier's medallions.

To all of you, congratulations. You are deserving of the accolades and be in no doubt that you have gone 'above and beyond' the conduct expected of your rank and/or position.

As a Regiment we have embraced 2018, the transition into RESET and the commencement of this intense period of modernisation. As the Corps looks forward to the future, we should all be excited about the opportunities and challenges ahead.

[**Sapper SITREP**]

5th Engineer Regiment

LTCOL Renée Kidson

IDP Holding Facility, Singleton Range

2018 afforded ample opportunity for 5ER to achieve our mission: to prepare Engineer capability for warfighting in defence of Australia & its national interests. The year launched with the arrival of a new command team. LTCOL Renée Kidson assumed command from LTCOL Andrew Johnson and WO1 Bill Lynch was posted to replace WO1 Russ Peel as RSM. Other notable arrivals included a new Unit Chaplain, Padre Kene Onwukwe; British Army lateral transfer and LT Phillippa Batchelor.

The new command team's first challenge was to consolidate the amalgamated regiment. 8ER and 5ER amalgamated in Nov 2017 to form what is now the largest Engineer Regiment in the Australian Army (posted strength); and the only GRES engineer regiment in Eastern Region. 14 Sqn (Adamstown and Dundas) became the 4th sub-unit of the Regiment while 102 Construction Sqn became a troop of 101 Construction Sqn and 6 Sqn scaled to a troop under 14 Sqn. With all of this reorganisation 5ER's footprint now stretches from Canberra (4 Sqn) to Orchard Hills and Dundas (5 Sqn), Singleton (101 Sqn), Adamstown (14 Sqn) and Holsworthy (RHQ, 101 Sqn, 2Tp 5 Sqn).

Our new regiment hit the ground running, as 5BDE transitioned to 'Ready' in support of 7BDE under the BEERSHEBA FORGEN cycle this year, with all 5ER's activities supporting that main effort. Our first was EX Clive Steel, the CO's planning retreat for the regiment leadership team of officers and senior NCOs conducted at HMAS Penguin early in February. This was followed closely by EX GREEN SAPPER also in February that included Infantry Minor Tactics and Force Preservation Training. These activities prepared the unit for participation in EX TELOPEA RUN, a battlegroup exercise conducted on Singleton Range and Holsworthy close training area as a Force Assurance Point in readiness for EX HAMEL.

5ER's contribution to 5BDE's Reinforcing Battlegroup (BG Waratah) was the Waratah Engineer Sqn, a composite squadron providing combat and construction engineer effects, ably commanded throughout by OC 4 SQN, MAJ Chris Conwell. At EX TELOPEA RUN, combat engineer effects provided to BG Waratah in Singleton included assisting and advising on Company level MDP development, green role search and construction of an IDP holding facility. Sappernuity was the order of the day for completion

of the IDP holding facility due to a shortage of construction stores through the BG Waratah supply chain. In true 'Ubique' style, simultaneous horizontal and vertical construction effects at Holsworthy were delivered by 101 Sqn, under command of MAJ Thomas Bielenberg. Tasks included cutting & grading a high quality fire trail on Holsworthy Range (Photo – Fire Trail Clearance) to Rural Fire Service standards.

This trail not only substantially aids bushfire risk reduction and management (already tested in the early commencement of the bushfire season with an April blaze in Holsworthy); it will assist Range Control with repair and maintenance of other tracks and trails with the Holsworthy Training Area.

On return from EX TELOPEA RUN the Regiment began the preparations for EX WARFIGHTER and EX HAMEL. Squadrons worked hard to 'Refit to Fight' and pre-position stores and equipment in Rockhampton ahead of EX WARFIGHTER commencement in May.

Two sections deployed on EX WARFIGHTER and successfully integrated with 2 CER, tasked with water-point and low-risk search. Our sappers received their (for some first) exposure to the Husky Route Clearance Package and had a thorough introduction to the full capabilities of the CER. WARFIGHTER proved to be a valuable networking and inter-operability experience; and enabled the Waratah Engineer Squadron to integrate smoothly with 2 CER on EX HAMEL.

The Waratah Engineering Squadron following exercise Hamel.

HAMEL was a busy and educational event for the Regiment. The Waratah Engineer Squadron deployed as a Sqn (-) with an SHQ and two troops. The Rockhampton insertion was completed by RAAF lift using KC-30, the first service air experience for many.

BG Waratah was first in the OOM out the gate for HAMEL, immediately following RSO&I in Camp Rocky. The Sqn was privileged to attach to the US 'Nightfighter' BG (1/293 National Guard, Indiana), and quickly found itself in the tactical fight immediately following on-time deployment to the field in SWBTA.

The first task was a route search to support 7BDE's move out of Sam Hill. With the two troops split between two US Companies and SHQ at Sam Hill, communications became a significant issue. This became apparent when E41 (Engr Tp 1) and Bravo platoon suffered an exercise mass casualty from an enemy rocket attack. E42 (Engr Tp 2) and SHQ then carried the (marsupial) lion's share of the workload. For the remainder of the exercise the Engineers were attached to BG Warhorse clearing Raspberry Creek, nuisance minefields and laying a few minefields. E42, mostly staffed by 14 Sqn, had an excellent (if tiring) Exercise. E41, staffed by 4 and 5 Sqn, was allocated the Route Clearance Package and received good field planning and execution experience.

On return from EX HAMEL, the Regiment caught its breath with stores refurb and return prior to preparation for EX JOHN MUIR, the unit mil skills section competition. A chance to get back to ENGR basics, EX JOHN MUIR was a highly successful round robin consisting of building search, bridging, section attack, WTTs, PT and navigation stands. Our Annual 'John Muir Trophy' was proudly heaved aloft by CPL Duncan-Watt (14 Sqn).

The Regiment has punched above its weight in 2018 in meeting support requests. A highlight was deployment of three 5ER members to AACAP18 in Yalata, SA over June-July. SPRs O'Reilly, Wilson and Laxton (101 Sqn) ably supported 6 ESR & and 17 Const Sqn with plant works.

5BDE's catch-cry in the 2018-19 Ready Year is: '5BDE: Now Ready; Now Deploying'; and the BDE seized its first opportunity to command a JTF (domestic) Operation in our BDE AO in October. JTF646 OP INVINCIBLE was a privileged opportunity for members of 5ER to deploy in support of 500

Sapper Lyndsey Cannel preparing for a route search

Wounded, Injured and Ill veterans competing from around the world in the Sydney Invictus Games. While we were honoured by the attendance of HRH Prince Harry, Duke of Sussex, HRH Meghan, Duchess of Sussex; and His Excellency the Governor General, General the Honourable Sir Peter Cosgrove AK MC (Retd), the veterans fittingly stole the show and captured the nation's heart, mind and pride with their inspiring stories of courage and personal resilience. Driven by the spirit of their examples, no less than five 5ER members were awarded a Commander JTF award for excellence in recognition of their outstanding operational service:

- CPL Cameron Amri (5 Sqn)
- LCPL Boyd Chatillon (5 Sqn)
- PTE Michael Green (5 Sqn)
- PTE Andrew Tonkih (4 Sqn)
- PTE Rowan Ziesing (4 Sqn)

5ER exercised the '5 P's' in practising likely ENGR tasks in preparation for OP INVINCIBLE, with both 4 and 5 Sqn planning and executing white role search activities at Parramatta Stadium and the Australian Institute of Sport Arena as lead-up Tuesday night training. This high-quality training attracted strong Sapper participation; it also built inter-Unit interoperability with our 1/19 RNSWR infantry colleagues, as well as reinforcing positive civ-mil relationships with the hosting organisations.

While the search activities were happening, Resources troop (101 Sqn) were assisting Plant and Construction Troops with horizontal and vertical construction tasks. Through mentoring the resources troop sappers learned new skills and gained a better understanding of the constraints involved in construction. They soon had a DIY front-yard landscaping opportunity to 'win (Quarry) engineer resources' and exercise RAE stonemasonry by adorning our RHQ Bailey Bridge entrance with beautiful local sandstone coping.

Above: 5ER Bailey Bridge outside RHQ.

Below: Sapper Christian O'Shea conducting White Role search training at the AIS Arena

2018 has also been an active Ceremonial Year. ANZAC Day saw us providing no less than eight Catafalque Parties, ranging across the state from Charlestown to Bega, & more than 74 unit members serving on these, laying wreaths and delivering guest speeches. Our Parade Card culminates on Sunday 11th November, when 5ER will exercise the right of Freedom of Entry into the City of Penrith as part of the Penrith Council's Remembrance Day event to commemorate the Centenary of WW1 Armistice. This very special FoE is also the first such right granted to our new regiment; and recognises our proud founding units' history of long, strong presence in and service to the Western Sydney Community. RAE Representative Colonel-Commandant MAJGEN Stephen Day, DSC, AM will take time out of his busy national Coordinator-General (Drought) role for the federal Government to honour us as the Parade Host Officer. The Parade will be followed by a demonstration MGB build to a packed Penrith City Paceway.

Our year is appropriately abutted by preparations to serve our community. In late 2017 OC 14 Sqn MAJ Bob Ellison commanded our elements aboard HMAS Canberra undertaking DISFOR (Domestic Incident Security Force) training; and we end 2018 in readying our Squadrons for the high-risk weather season and possible summer DACC tasking.

5ER prides itself on forging enduring relationships; and the NSW Sapper's Association is amongst our strongest HOLDFAST supporters in the community. In 2018 we co-hosted not one, but three Regimental Dinners, celebrating our connections with the Canberra, Sydney and Newcastle communities respectively. The Association has again generously sponsored the highly-prized Sapper Excellence Award. The 2018 Winner was awarded at our Sydney Dinner: Congratulations SGT Sebastian La Rosa (5 Sqn) other noteworthy individual achievements include two Prince of Wales Award recipients: RHQ's CAPT Andrew Hargreaves (also COAC GRES Student of Merit) and CPL Phil Malligan (101 Sqn).

We commenced with our Hails; and we'll close with our Farewells. During 2018 the Regiment bid farewell to a number of long servings members. WO2 Shane Kay and WO2 Pete Sherwood took discharge in April while Sappers Jeff Gill, Al Giddings and Wayne Clouten all discharged through the year.

Cpl Joe Zivkovic being presented with the sixth clasp to his Defence Long Service Medal by CO LTCOL R Kidson

CPL Joe Zivkovic being presented the sixth clasp to his Defence Long Service Medal, recognising 45 years of service, by the Commanding Officer. Joe is a carpenter and has served on more than 10 AACAPs and been awarded the Jonathan Church Ethical soldier award. CPL Zivkovic is a shining example to us all of how to Get Involved, Grow & Give Back.

CO's Corner: Eyes Up & Out for 2019

CO 5ER Command Philosophy is 3G:
Get Involved; Grow; & Give Back

There have been plenty of opportunities for all of us to go 3G in 2018! This has been a year of focused investment in consolidating our Regiment post-amalgamation, & building Combined-Arms Interoperability in support of the Ready 5BDE Reinforcing Battlegroup. 5ER has built a strong reputation with our Arms Corps colleagues as a combat multiplier in the battlespace. In 2019, we will seek to cement our habitual in-service relationship with 2 CER and deploy on EX BG Warfighter19. We will return to a focus on RAE skills; & on creating quality opportunities (Operations and Exercises) to apply both our combat and construction capability. We will reinforce our Social Media presence and solidify our relationships with the communities that we serve & represent. We will continue to manage our diverse workforce flexibly under TWM and seek ways to harness your skills – whether from your military or civilian backgrounds, so that you can give your best. So in 2019, let's Stay Involved, Sustain our Growth, and Surpass expectations to Give Back to the ADF, Army and our community.

[**Sapper SITREP**]

6th Engineer Support Regiment

LTCOL Nicholas Bosio CSC

This year saw the consolidation of the Regiment as the theatre engineering Unit, with a diverse deployable capability that supported domestic and international exercises and operations. In the previous two years, the 6th Engineer Support Regiment (6 ESR) has seen a significant shift in its preparedness culture. An agile, short notice response element is prepared and rehearsed to respond via sea, air or land into semi-permissive environments within the region. This element is task-organised with an organic logistic and maintenance capability, and can be reinforced up to a Squadron group. The Regimental Headquarters is also well postured to constitute an Engineer Task Group and integrate attachments and coalition assets.

Above: 21CS Beach Access Ramp.

Below: 21CS dumping material on One Mile Beach.

21st Construction Squadron

CAPT Jack Lush

On the back of completing the largest Army Aboriginal Community Assistance Program (AACAP) in 2017, the 21st Construction Squadron shifted its focus to collective training and support to operations in 2018. These activities commenced with readying a Force Element to support Fiji and Tonga in the wake of Tropical Cyclone Gita. After enabling and participating in Ex HAMEL 18, the Squadron led the planning and construction of infrastructure for Operation APEC 18 ASSIST – Papua New Guinea, in support of Headquarters 1st Division.

The yearly training cycle saw the execution of graduated training from Section, Troop and Squadron level activities, operating in dispersed and complex environments. The Squadron learnt to operate effectively with the L121 vehicles, utilising the full spectrum of military communications equipment. The culmination of this training saw the Squadron conduct dispersed tasks, whilst maintaining effective command and control over hundreds of kilometres between Fraser Island, Wide Bay and Shoalwater Bay, which included participation on Ex HAMEL.

During the Regiment's training continuum and participation on Ex HAMEL, the Squadron was also able to execute outstanding amphibious and littoral training. This was conducted in support of the National Parks and Wildlife Service on Fraser Island, where a Section executed advanced combat engineering skills with the construction of a timber roadway and demolition of a dilapidated bridge. Simultaneously, another Section conducted pre-works for Ex HAMEL with the enhancement of the One Mile Beach loading ramp, being one of the primary amphibious lodgement points for the exercise.

Separate to Ex HAMEL, 6 ESR was tasked to provide sustainability and survivability support to Operation APEC 18 ASSIST in Port Moresby, Papua New Guinea. This deployment signified the first consolidated overseas deployment for the Squadron since RTF4 in 2008.The Squadron deployed by C-17, taking just 24 hours to commence construction works. The JTF HQ and camp were built at Murray Barracks, and provided an excellent platform for the JTF to conduct partnered operations with the PNGDF and PNG Police Services.

Operational Support Squadron

MAJ Matthew Gilson

In response to the evolving Regimental Concept of Operations, Operational Support Squadron (OSS) continued to grow and develop in 2018, with plenty of opportunities to test new ideas, processes, and equipment. Several Operational Support Troops (OSTs) were attached to the Squadrons for major activities, including AACAP, Ex HAMEL and Operation APEC 18 ASSIST, as well as maintaining support to directed preparedness tasks. As part of the major exercise period, the 21st Construction Squadron deployed with an organic OST before the remainder of OSS stepped up and established an Engineer Logistic Park that provided support to the dispersed engineering operations in Wide Bay, Shoalwater Bay and Fraser Island. This was a significant development in the establishment of OSS as a deployable Regiment logistic capability and a test of the concepts for a Theatre Level Engineer Logistic Node.

The Land 121 Phase 3B fleet variant rollout has also had a significant impact, with the transition from legacy fleet almost complete. This change has brought about many challenges, but also significant opportunities to increase our capacity and to evolve the way distribution functions in the field. This has been led by a Transport Cell made up of Assistant Driving Instructors from throughout the Regiment who have been consolidated in OSS to achieve a significant driver training effect for the unit. The requirement to transition a large number of staff through our legacy fleet and onto the new MAN truck fleet has taken considerable focus and effort throughout the year, and has been one of the Squadron's standout achievements in 2018.

OSS PMV GMV.

20th Explosive Ordnance Disposal Squadron

CAPT Josh Watson

Member of 20EOD honing his skills.

2018 was an extremely busy year for the 20th Explosive Ordnance Disposal Squadron (20 EOD), not only due to training and operational commitments, but also as the Squadron commenced preparation to raise the third EOD Troop from 2020. The year commenced with the Wallaby Training Series at Canungra Field Training Area and Wide Bay Training Area. Here the EOD Teams practiced and honed their skills alongside other 6 BDE enablers, RAAF EOD and Australian Federal Police elements. The Wallaby Training Series also included the Squadron Open Day at Canungra, which was not only attended by the Squadron's families and friends, but also by the Tunnel Rats and RAE Vietnam Vets Associations, making the Open Day a memorable occasion for all Squadron members.

The middle of the year saw the Squadron support Ex HAMEL, with both the Squadron Headquarters and the online EOD Troop providing support to the 1st Division and the 7th Brigade. Not only did the members of 20 EOD Squadron provide excellent support to various organisations, but the relationships built at all levels will ensure that 20 EOD will continue to positively affect the battlespace into the future.

The end of the exercise period saw the highlight of 20 EOD's social calendar, as the Squadron hosted the inaugural EOD Dinner. The dinner received large support from the Redcliffe RSL and was attended not only by current Squadron members, but also

past members and those associated with RAE and RE Bomb Disposal. It was wonderful to see how the camaraderie and experiences of past RAE EOD Technicians continues to inspire and strengthen the serving members in today's 20 EOD Squadron.

The last half of the year saw 20 EOD Squadron conducting the EOD MOD 2 course on behalf of Defence. Thanks to admirable support from other RAE and RAAOC units, 20 EOD Squadron were able to conduct the largest EOD course ever run in Australia. Simultaneously, the Squadron deployed personnel on overseas operations and also continued our community engagement activities with various charity organisations (Stand Tall for PTS) and schools throughout the Greater Brisbane area.

WO2 Ian Ratcliffe being presented the Federation Star by Commander 6th Brigade, Brigadier Susan Coyle, CSC, DSM, at Enoggera Barracks on 15 Oct 18.

WO2 Ian 'Ratty' Ratcliffe joined the Australian Regular Army on 24 May 1977. He was allocated to the Royal Australian Engineers after good advice from a Special Air Service SNCO, at Kapooka, who convinced WO2 Ratcliffe that service in an arms corps would be more interesting than becoming a storeman.

A plant operator, he has served in many engineer units during his career including 20 DIV ESS, 2/3 FER, 19 CE WKS, SME, 8 CER and 8 ER, and currently he is serving with 6 ESR. WO2 Ratcliffe has served operationally in East Timor.

Ian is known to many in the corps and we congratulate him on over 40 years service with the Regular and Reserve engineer units.

[**Sapper SITREP**]

11th Engineer Regiment

LTCOL John Anderson

11 ER commenced 2018 at a gallop, with the regimental headquarters focused on its main effort of mounting the 11th Brigade's All Corps Search Company Force Element to OP ATLAS in support of the 2018 Commonwealth Games.

Transitioning into RESET, 11ER's tempo has remained high with the opportunity to improve its individual soldier and sapper skill-sets for the first time in many years. 11ER's Regimental shooting and demolitions weekends were well resourced, highly successful and enjoyed by all. The conduct of 11 ER's first courses camp also increased the regiment's capacity and has set the conditions for a successful road to Hamel 2020 collective training program.

The requirement to support operations has continued with 11 ER Army Reserve sappers providing individual reinforcements to Op ACCORDION, Op RESOLUTE, Ex PUK PUK in Papua New Guinea, EX SAUNDERS in regional SA and instructor support to the School of Military Engineering.

Congratulations also go to 11 ER's RSM, WO1 Robert Clarke, who has been selected as RSM 2 CER for 2019.

11th Combat Engineer Squadron

11 CES enjoyed a busy start to 2018, providing the OC and SHQ staff, a troop of combat engineers and Search Advisors to OP ATLAS. During the Commonwealth Games, 11 CES provided support to the QLD Police Service conducting low risk search tasks.

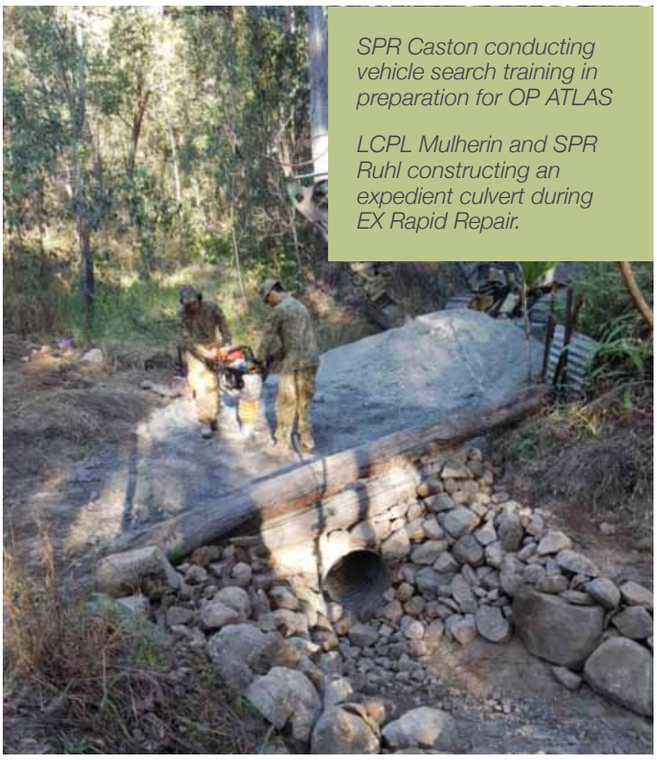
Now in RESET, 11 CES has shifted focus to individual and small group training. Two week long training blocks in 2018 has allowed 11 CES sappers to regain competence and confidence across a variety of skills including chainsaw and portable sawmill operation, tree felling, plant and vehicle operations, combat shooting, first aid and more.

11 CES Ex Rapid Repair weekend provided the opportunity for the sappers to get on the tools and hone their skills, with the Section Commanders and junior leaders practicing their combat engineering planning and orders skill-sets. Concurrent section level tasks where conducted across a number of sites, including road repair, culvert construction and PMV obstacle design and construction.

35th Combat Engineer Squadron

35 CES has enjoyed a busy and rewarding 2018. In Townsville and Rockhampton, 35 CES personnel focussed on developing their individual and collective combat engineer capability. This included combat shooting, Infantry Minor Tactics, expedient construction, mine warfare, demolitions and search. Despite the tyranny of distance, training weekends occurred at Shoalwater Bay, High Range and Mackay.

Worked closely with 3 CER and other 11 BDE units, 35 CES solidified relationships and proved capable of supporting larger activities when



SPR Caston conducting vehicle search training in preparation for OP ATLAS

LCPL Mulherin and SPR Ruhl constructing an expedient culvert during EX Rapid Repair.

From top: 35 CES sappers practicing mine warfare drills during Ex Warren.

SPR Clark and SGT Baxter conducting road improvements during Ex Rapid Repair.

MAJ Paul Randall, OPSO 11 ER proving the structural integrity of the "nail-less" NEB.

required, including three members deploying on Operation RESOLUTE as part of Transit Security Element 90. Sustained dedication and service was recognised through the presentation of numerous 11 ER Command Team coins and Spr Mason being awarded the Sappers Award for Excellence in Engineering (ARES). 35 CES TRG WO, WO2 Shane Clark was awarded a Silver Commendation. Significantly, the OC 35 CES, MAJ Peita Fraser was selected to attend the Canadian Forces Command and Staff College.

104th Construction Squadron

In 2018, 104 CS reclaimed their rightful home in the historic Milford Street Ipswich Training Depot. Planning and assessment is currently underway for a major refurbishment of the depot, expected to begin in 2019.

Recruiting and building construction capacity has been a key focus for 104 CS in 2018. 104 CS training schedule has been busy, focussing on improving the Ipswich Training Depot; providing road construction, counter-mobility and survivability support to 11 ER collective training events; constructing a series of demolitions targets for the 11 ER demolitions training weekend, including a wooden NEB; and improving their individual soldier and sapper skill sets.

An increasing theme in 2018 has been the provision of construction support to operations and exercises, with 104 CS Sappers deploying on OP ATLAS, OP RESOLUTE, EX PUK PUK, EX SAUNDERS (AACAP 2018), providing instructor support to the School of Military Engineering and conducting a unit-run single code plant operator's course.

[**Sapper SITREP**]

19th Chief Engineer Works

LTCOL Glen Billington

As a unit of just over 50 members, 2018 has been yet another year of 19 CE Works continuing to excel and demonstrate its ability to deliver solutions to real time challenges for the Australian Army.

The unit has maintained the deployment of members to the Middle East Region, supported the delivery and planning of multiple projects in support of the Army Aboriginal Community Assistance Programme (AACAP) and reinforced its role as a leader in supporting near regional international engagement activities. Such diversity is not new for this unit which celebrated its 55th birthday in 2018.

The release of the unit history 'Highlands to Desserts' commemorated this milestone and has allowed many of its colourful stories to be shared within the Corps and wider public. This significant occasion reiterated both ongoing relevance of the unit and its emphasis on the importance of its people. As an Army capability that largely rests in intellectual skills rather than equipment the importance of each and every member of the unit team cannot go understated. Without the skills and ongoing commitment of each member, the stories and projects undertaken each and every year simply would not be possible. The update and collection of stories below highlights the diverse and important roles that 19 CE Works has undertaken throughout 2018.

Operations

MAJ James Scott

19 CE Works has continued to support operations in the Middle East Region (MER) by filling key roles in the HQJTF 633 Engineer Support Element (ESE). 19 CE Works deployed Majors Michael Sipple, James Scott and Greg Barrowcliff in the roles of Senior Project Engineer, Captains Jarvis Black, Astrid Hagqvist, Tim Doust and Amrinder Singh as Project Engineers, Warrant Officer Class One Richard Hall as Works Manager, Warrant Officer Class Two Daryl Coady and Sergeant Jamie Millar as Works Supervisors and Lance Corporal Troy Roseman as Draftsman. The ESE is also made up of personnel from various RAAF units, 6 ESR and individual deployments of RAE personnel including reservists, making the team truly reflective of the joint environment.

Due to uncertainty surrounding Australia's future operational commitment in the MER, significant new infrastructure projects have been curtailed and the ESE has transitioned to a focus on the maintenance and improvement of existing infrastructure. This focus has still kept the ESE busy with work on upwards of 40 smaller projects in various stages at any one time. The ESE has managed projects over the past year worth $18.5 million with a total expenditure of $10.6 million. The minor projects across the MER aimed to ensure continued operation of aging infrastructure and improvement to existing areas functionality, capacity, security or safety.

The ESE has improved living and working conditions for deployed personnel through projects such as refurbishment of ablutions, LIA and working accommodation, workshop redevelopment, gymnasium upgrades and new living accommodation blocks. Works such as the generator replacement programs and continued support for the MER CIS Upgrade Project ensure ongoing power and communications critical for life support and operational capability.

Project Management Team Bravo have continued to support the Afghan National Officer Academy and the Australian mentoring efforts there through infrastructure projects delivered under the NATO Afghan Trust Fund. Captain Jarvis Black and Warrant Officer Daryl Coady have continued the work of Captain Dave Bellas (HQ 7 BDE) and Sergeant Gav Williams (6 ESR) in the previous rotation. The security fencing project ($867k) has provided enhanced security and amenity through compartmentalisation of the campus. The range road project ($365k) has improved safety and security in the close training area by providing safe all weather access through to sentry points, training areas and egress points. The range shelters project ($1.1m) is delivering increased training capacity through provision of range shelters across the campus and training area.

The addition of a draughtsman to the ESE has continued to yield benefits for the ESE. LCPL Troy Roseman has built upon the success of CPL Jackob Marek in establishing the deployed drafting capability in 2017. Their product development

WO2 Coady conducts an inspection of drainage works as part of the road remediation works at Field Marshal Fahin National Defence University, CTA.

has enabled understanding of project concepts by a wide range of stakeholders. Importantly, in-house designs are now being conducted for many projects to the 30% stage before being taken on by construction agencies, who are then responsible for certification. This proof of concept provides great utility for RAE in developing design capability.

Despite being spread across three countries, the ESE has continued to more closely integrate thanks to work conducted by the draughtsman. The introduction of Bluebeam into the draughting suite of software using cloud based file storage allows forward project management teams and the draftsmen to conduct real time updates to design documentation using mobile tablets on site. This enables improved design product development and management of variations/defects when employed on recons and site inspections, and facilitates an improved design process when key stakeholders are physically dislocated.

Despite the lull in major new projects, engineers across the MER are making themselves indispensable to the units they are supporting.

12 Works Section

MAJ Mick Sipple

Domestic Works Program

Domestic works included the management of the Defect Liability Period for the Helicopter Insertion and Extraction Training (HIET) facilities in Townsville, Darwin, Brisbane and Adelaide, and the Tank Integration Interim Facilities (TIIF) in Townsville and Adelaide. WO1 Richard Jones supervised the construction contractor in the rectification of any construction defect that arose during the liability period.

12 Works Section provided support to a project delivering L121 facilities at Bandiana. The team, consisting of CAPT Matthew Jetson, WO1 Richard Hall, and WO2 Michael Brescinini, conducted a Scoping Study at Bandiana and developed a comprehensive scope of works and costing for the L121 facilities. This information was then handed over to Capital Facilities and Infrastructure Branch to be delivered as part of one of their projects, an efficient delivery model.

The Section also supported a HQ FORCOMD proposal for an Urban Operations Training Facility in Townsville. HQ FORCOMD engaged 19 CE Works to develop a detailed cost estimate for the delivery of the project. 19 CE Works was able to engage a Quantity Surveyor to provide an accurate and detailed costing to support the proposal. Although 19 CE Works has passed responsibility for this project to HQ FORCOMD and Estate and Infrastructure Group, the good work undertaken by LCPL Troy Roseman was the catalyst for this project to receive the attention and focus that it needed to move forward.

International Works Program

12 Works Section has been working closely with International Policy Division (IP Div) with a focus on projects in PNG, Fiji, and Vanuatu. A major achievement for the Section was the construction and handover of a 100-person two-storey accommodation block for the PNGDF at Wewak. This included the electrical and sewage remediation of the barracks, demolition of the existing building, and the construction of the new facility. CAPT Jarvis Black and CAPT Scott Atkinson led the project team, with WO2 Daniel Thorne and SGT Jamie Millar supervising the construction. This team managed the design and construction to ensure a robust and sustainable facility was handed over to the PNGDF.

IP Div called upon the technical expertise of 19 CE Works to conduct reconnaissance of barracks infrastructure in Vanuatu and Fiji. The Vanuatu recon produced a Feasibility Study Report, which prioritised the delivery of infrastructure options

at Cook and Tiroas Barracks. The study focused on infrastructure and facilities, which designed to support the upcoming Vanuatu Military Force recruitment drive. The Fiji recon produced a Scoping Study Report on the delivery of a Humanitarian Assistance Disaster Relief facility at Black Rock Camp. The facility will provide the Royal Fiji Military Force with a facility to plan, coordinate, and launch first responder operations after a natural disaster. CAPT Matthew Jetson, WO1 Richard Hall, WO2 Michael Brescinini and SPR Andrew Davies completed these studies. The reports play an important role in providing IP Div with informed engineering solutions for the delivery of infrastructure in the near region.

Currently, the section is back in PNG to complete an Infrastructure Assessment on all PNGDF infrastructure in Port Moresby and deliver an Air Movements Facility (AMF) at Jacksons International Airport. The infrastructure assessment required the development of a framework to define, assess and report the condition of facilities and infrastructure. CAPT Scott Atkinson is the lead ably supported by WO2 Greg Buckley and SPR Tim Kesby. The AMF provides a logistics hub for ADF exercises and operations in PNG. WO2 Kit Turner, SGT Jamie Millar and CPL Jakob Marek provide the supervision of the construction.

12 Works Section has relied on ARES support to supervise the construction of works in PNG. The knowledge and experience of the ARES personnel has assisted the section in achieving its mission. Special thanks to WO1 Neil Christie and WO1 Aaron Watts for your ongoing support.

Above: ADF CDF Air Chief Marshal Mark Binskin, PNG CDF Brig Gen Gilbert Toropo attend the ribbon cutting of the 100 man LIA block for the PNGDF in Moem Barracks

Below: The completed 100 man LIA block for the PNGDF in Moem Barracks.

11 Works Section

MAJ Andrew Oxlade

Army Aboriginal Community Assistance Programme (AACAP)

Throughout 2018, 11 Works Section maintained a consistently high tempo, managing a portfolio of five AACAP projects (AACAPs 2016-20) in partnership with the Department of the Prime Minister and Cabinet. AACAP continues to provide an excellent opportunity to train and exercise Project Management Teams (PMT) in multiple disciplines across all project phases. In addition to the $7 million investment per project, Army's contribution achieves real and lasting benefits to improve infrastructure, health and living conditions in remote indigenous communities.

Closing out AACAP 2017, the team of CAPT Michael Lynch, CAPT Amrinder Ghuman and SGT Erin Moore worked diligently and with great resolve to overcome a number of design and certification challenges with the Toomelah Multi-purpose Facility (MPF). Following rectification works focused on the building fire system, certification was achieved and the MPF handed over to the Local Aboriginal Land Council on 02 July. During a large and at times, moving ceremony, the

local community spoke of making the most of the opportunities brought by AACAP and the new facilities and noted the tremendous contribution of both 6 ESR and 19 CE Works.

This year, AACAP 2018 was delivered in Yalata, South Australia, a community approximately 200km west of Ceduna on the Great Australian Bight. The team of CAPT Tim Doust, WO2 Liam Wardle, WO2 Darren King, WO1 Gary Lewis and WO2 Dan Thorne managed the planning and delivery of a challenging scope of works and the largest ever AACAP budget at $8.7M. The project was also unique with extensive collaboration between federal and state levels, including capital funds contributed by the South Australian government.

A challenging development phase, with changes in scope and budget, reinforced key project management skills across all ranks. Consistent effort over the preceding twelve months enabled construction to commence on schedule in May. Led by 17th Construction Squadron of 6 ESR, the Army delivered 'Works Package A' which consisted of a new three-bedroom house, upgrading the caravan park services and amenities, and constructing approximately 1km of sealed road between the community and the airstrip.

A construction contractor for 'Works Package B', valued at more than $4.5M, was successfully procured under the Indigenous Procurement Policy. Ballardong Pindan Pty Ltd delivered the Child and Parent Centre (CPC), the Covered Meeting Area (CMA) and managed the demolition of the old Yalata Roadhouse.

The CPC included areas for children aged 0–2 years, and 3–5 years, as well as an outdoor play area and shared offices and amenities. The team collaborated closely with community and school groups as well as the Department for Education to ensure the CPC met the required standards for early childhood facilities. The CMA is sited next to the recently completed amenities building (delivered by 19 CE Works in 2017). It is an open portal-frame structure with storage rooms, meeting the key functional requirements as an important place for community gatherings and sporting events. One of the most challenging scope items was the demolition of the heavily contaminated Yalata roadhouse. This building had historical significance to the community; originally serving as the Mess at the Maralinga test site it was relocated

Adam Billington, site manager Ballardong Pindan, Indigenous trainee, Ruban Windlass and 19 CE Works project engineer, CAPT Tim Doust

to Yalata Mission in the 1970s – asbestos and all. Following demolition, a memorial was constructed to commemorate the building's significance – described as an 'old friend' by a local elder.

While the AACAP 2018 PMT focused on works on site, the AACAP 2019 PMT of CAPT Tom Close, CAPT Amrinder Ghuman and WO2 Rod Smith was planning in earnest. In February this year, the Minister for Indigenous Affairs announced that AACAP 2019 would be delivered in Jigalong, a remote community in the Pilbara region of Western Australia. Under a compressed development timeframe, the team focused on quickly turning project scoping into functional designs. The proposed scope of works includes a community youth centre two creek crossings for a key community road, an amenities block and picnic area. For this project the PMT developed a modified medium works contract for a design and construct methodology to suit the specific requirements of AACAP 2019. Working with Parakeelya Indigenous Architects and Builders (PACM), 6 ESR and the Jigalong community, design and approvals are rapidly progressing to enable construction to commence in May 2019.

As always, AACAP involves extensive liaison and coordination with a broad range of people and agencies including Army units, multiple State and Federal government departments, consultants, contractors, utilities providers and local communities. Works Manager WO1 Baulch was instrumental to the unit's success, planning and coordinating the section's effort across the entire programme. Overall, the commitment and tireless efforts planning and building strong relationships saw each of 11 Works Section's PMTs well placed to respond to project challenges and successfully achieve AACAP objectives.

Force Protection Engineering (FPE)

CAPT Amrinder Ghuman

Force Protection Engineering remains a small, yet key capability for 19 CE Works to achieve its mission. Pursuit of technical excellence continued through participation in the Weapons Effects and Force Protection Engineering Course (WEFPEC) at SME, the Royal Engineers Force Protection Engineering Course at the Defence Academy of the United Kingdom and during multi-national collective training on Exercise KINGS RISE in the Netherlands.

Enhancing Whole of Government interoperability and coordination remained a focus throughout 2018. 19 CE Works continued its involvement in the International Physical Security Forum, this year held in Bad Reichenhall, Germany, and also participated in protective security courses delivered by ASIO's T4 branch. In October, the unit again hosted the annual Australian FPE Seminar. The two-day professional forum brought together a range of participants from Defence, Federal and State Government agencies and academia in order to improve awareness, knowledge and understanding of FPE. Lessons and planning considerations from a range of international and domestic operations were shared, as was the latest in capability development and academic research. The presentations are located on the 19 CE Works SharePoint page.

Operations Cell

The operations cell has been busy behind the scenes in 2018 making sure the wheels keep turning alongside the delivery of key infrastructure projects. The operations cell for 2018 was made up of the OPSO, CAPT James Martin, the OPSWO, WO2 Matthew Tanner, and the OPS LT, LT Jacob Palmer.

The unit maintained the delivery of technical professional development training for all unit members (project staff, draftsman, surveyors, and admin/log staff). This exposed unit members to industry best practice, technical skills and advice not found within the wider ADF, and also confirmed that the organisation's project and business processes were equivalent to current industry standards. Although this training has been fluent throughout the year, a large majority of technical training was conducted in late Feb 18 as part of the technical development week. This included briefs and training delivered by industry partners and external organisations in the areas of Quantity Surveillance, contract law, the suite of contracts available for use, construction management and contract negotiations. This was a large success and something different from previous years.

PTE Brandt, CAPT Close, MAJ Lobb, WO2 Brescianini, WO2 King, WO1 Hall durong the 19 CE Works ration pack Bushmans Masterchef competition. The purpose was to promote team work, communication, thought and time management.

Over the period 23-27 Jul 18 the unit deployed to Holsworthy and Marrangaroo training areas IOT conduct annual field and resiliency training – Exercise Green Week. This was a well-structured week of activities enjoyed by all unit members. Exercise Green Week was broken into two main phases. Phase one included the conduct of 9mm, EF88 and F89 range practices. The unit also conducted some green activities during the evenings including weapon assembly whilst blindfolded. Phase two included the deployment to Marrangaroo and the conduct of the CLC course under the guidance of the unit/BDE Padre. The unit was split into 4 even teams and conducted character building and leadership activities over a three day period. Two of the feature activities included the bushman master chef and the coin bridge challenge. Other than some cold mornings and evenings this was thoroughly enjoyed by all unit members.

Lastly, the operations cells has been making sure the daily running of the organisation continues. This has included readying personnel for deployments, conduct of the TPD process, and current/future planning. The operations cell has enjoyed the year and look forward to a steady period leading into Christmas.

Project Support - Draughtsman

The 19CE Works draughting element has had a very busy start to the year with design work being conducted for AACAP's 17 and 18 (Yalata and Toomelah) Jigalong, Vanuatu, Fiji, PNG and the MEAO. The team has been utilizing Revit 18TM,

LumionTM, CamtasiaTM drawing packages throughout the fore mentioned projects as well as the introduction of Bluebeam into the drafting suite. The purpose and benefit of these packages is to give a clear demonstration of how each component of the project will function and how it is expected to be constructed. This enables those trades erecting the projects to fully understand how the design is to be completed. With 2D, 3D and 4D capabilities making it the process easier for those on site to deliver. The draughting team have been utilising these programs to complete concept design and plans for external stake holders to both aid and communicate between project managers, designers and construction groups.

The draughting capability of 19CE Works isn't limited to sitting in front of a monitor, this first part of the year has seen members of the team conducting on site works and assisting with site supervision showing that the unique skill set and construction knowledge transfers to an onsite capability. A draughting team member has recently returned from PNG where he was conducting design recons along with supporting scope and study recons. Another has been working in Fiji and Vanuatu providing trade knowledge while supporting scope and study recons to develop concept design for external stake holders whilst also conducting multimedia support for the unit.

With current and future projects on the rise, the draughting team is continuing to develop their skills to further their knowledge. They are continually seeking to learn new skills and keep up with ever changing technology and the requirements of projects. They endeavour to ensure their capability is on par with civilian counterparts and allow Army to maintain a vital asset.

Project Support - Survey

The Survey Section has provided support to a number of projects, as well as supporting the School of Military Engineering, Construction Wing in the delivery of promotion courses and the Regimental Officers Basic Course.

The year started off with SPR Warwick Cox deployed on OP Southern Discovery 17/18, providing surveying support to the Australian Antarctic Division (AAD) in the vicinity of Davis Station and an additional surveying task at Macquarie Island. The remaining two members of the Survey Section, CPL Kelly Hall and LCPL Bradley Smart started off with providing support to the inception phase of AACAP 19 at Jigalong, and the inception and development phase of the LAND121 Bandiana Facilities project in the vicinity of Albury-Wodonga Military Area (AWMA). Data collected during these reconnaissance surveys assisted with design works and volumetrics for the projects. Throughout the year members successfully completed promotion courses and provided further support to projects and operations, such as the PNG infrastructure audit and OP Southern Discovery 18/19.

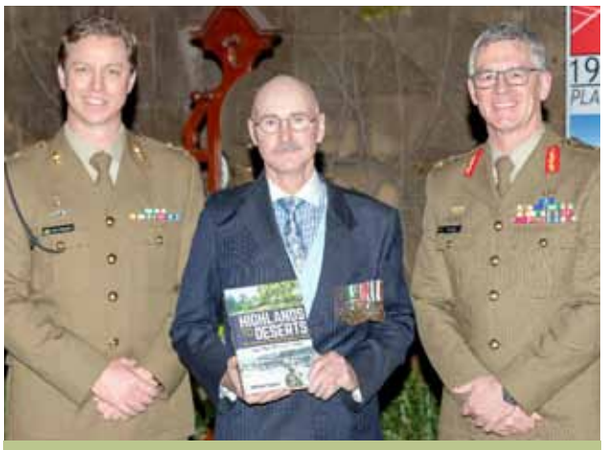
OP Southern Discovery

During the Austral Summer of 2017/18, SPR Warwick Cox and SPR Samuel Kelly (6 ESR) were tasked to provide survey data that would assist in decisions on site selection for a potential Year Round Aviation Access gravel runway near Davis Station. The 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 a gravel runway at Davis Station under the Australian Antarctic Strategy and 20 Year Action Plan.

All works for this project was conducted on the Vestfold Ridge, approximately 5km North of Davis. The equipment used was a Trimble R8 GNSS Real Time Kinematic (RTK) system. The system consisted of three Trimble R8 receivers and a TDL450 radio. RTK was utilised for all surveys, including Ski-way stake-out and the deployment of Ground Control Points for Aerial Survey.

Administration, Logistics and Financial Support

As the unit found itself conducting frequent project tasks in a domestic and international setting, the support provided by the admin, logistics and financial cell was key to achieving project success. The admin cell has been fully manned this year with the Chief Clerk, SGT Robert Lammers, carrying over from 2017. New editions to the team included PTE Paul Brandt and PTE Lidiya Tangey who is a gap year member posted to the unit IOT learn more about what Army has to offer. The admin cell have worked tirelessly to make sure member and unit administration is completed in an effective and efficient manner. The logistics cell has been equally busy with the Quartermaster, WO2 Andrew Jones, and new edition to the unit, CPL Alex Buttress, organising key resources IOT maintain project teams on AACAP and other domestic projects. They have also assisted the OPS cell in making sure that key unit tasks have been resourced effectively. Lastly, due to the large amount of external funds that come through the unit due to project expenditure, the unit would struggle to cope



Left to right: Commanding Officer 19 CE Works, LTCOL Glen Billington, the author Major Mike Tyquin, Chief of the Army, LTGEN Rick Burr at the official book launch of "Highlands to Desert"

if it wasn't for the work of Mr Mark Carolan who is designated Financial Officer. Mark has been with the team for almost 15 years now and is, and has always been, a valued member of the unit. Mark has been able to provide key strategic CFO advice to project teams IRT project expenditure and has the demanding job of overseeing that finances are used and accounted for correctly. Noting that there are multiple domestic and international projects at any one time, Mark still seems to find a smile and a laugh.

Unit History Book Launch

This year 19 CE Works celebrates its 55th year of service as a unit in the RAE. A little over a year ago the CO, LTCOL Glen Billington and the Senior Works Manager, WO1 Ian Hancock begun the planning and research of compiling all that history into a book. This task took significant effort and required input from sappers old and new. 19 CE Works was able to obtain the resources of historian and author Mr Michael Tyquin who has detailed the trials and tribulations of the unit over the 55 years. The booked, Highlands to Deserts, details the units history from its establishment in Popondetta in Papua New Guinea in 1963, service throughout the world including Vietnam, Cambodia, PNG, Fiji, Samoa, Vietnam, East Timor, Solomon Islands and more recently: Afghanistan, the Middle East and Iraq to its current commitments in 2018. The book was launched on 20 September 2018 by the Chief of the Army LTGEN Rick Burr AO, DSC, MVO. During the book launch the CA described 19 CE Works as a "great enabler of the rest of the Army's construction engineering capabilities. It's a force multiplier in every sense of the word and not just for the Australian Army or ADF"

Social Media

The 19 CE Works' Facebook and Twitter accounts have seen continual growth and are now well established on both platforms. 19 CE Works' goal on social media is to bring together construction and project management professionals in the ADF, and those working in partnership with the ADF, to promote professional discourse and knowledge sharing. Social media allows wider Defence, other government agencies, and the general public to see the outputs and understand the capability of Army's project management agency.

These platforms provide a mechanism to inform those interested in Defence engineering or project management, both domestically and abroad, as well as announcing project milestones. The use of project videos has proven successful for providing an updated summary of project progress. The videos for Halivim Poroman, Vanuatu Scoping Recon, and AACAP 2017 were all received very well by the public. Facebook and Twitter have also been used to inform followers of key unit events and activities including the Force Protection Seminar, continual professional development training, and participation in the Sydney OXFAM Trailwalker.

Social media has been used to increase engagement with the private sector through recognition of joint effort and achievement, to invite external members to unit training, and share information and ideas. 19 CE Works' social media are continuing to develop and increase its presence on Facebook and Twitter. It provides a platform for ADF engineers, wider Defence, industry, and public to engage with the Unit. You can join the community at either of the following:

Conclusion

In 2018, 19 CE Works has continued to demonstrate the versatility and adaptability that a small and highly professional engineering workforce offers to the Corps, Army and ADF. From the Middle East to our domestic barracks, near region neighbours and remote Australia the unit has continued to be the Army's premier deployed and remote infrastructure planners of choice. In the words of the Chief of Army, LTGEN Burr, "With its unique capability, and the special skills resident in its people, 19 CE Works will remain a vital element in the response to meeting the challenges of our dynamic region… There is no doubt in my mind that there is so much more to come from this unit – and more history to be made!".

[**Sapper SITREP**]

22nd Engineer Regiment

LTCOL Sharon Coates

Although a small troop, 2017-2018 was an incredibly busy time for the Sappers at Newborough and time after time they proved their dedication to the Regiment, Army and the local community. What follows is a brief overview of some of the key activities over the last year.

6TP is currently going through a rebuilding phase, with the support of the Regiment, 4BDE and Defence Force Recruiting (DFR), the Troop over the past several months has been attending a range of recruiting activities around the West Gippsland region. In late 2017 6TP setup a stand at the Federation University open day in Churchill. The troops spoke to a large range of Federation University students (and some staff!) about the benefits of the Army Reserve and about the Engineer activities at Newborough.

6TP has also been working with DFR during their Tri-Service recruitment sessions throughout the Gippsland region. Presentations were given by members from DFR at local RSL's within West Gippsland, including trips to Wonthaggi, Leongatha, Traralgon and Warragul, with support from 6TP soldiers. During these presentations the NCO's present were invited to speak about life in the Army Reserve and introduce those present to their local Army Reserve depot at Newborough and the Engineer role that they carry out. CPL Place also attended DFR sessions at local high schools within the region and spread the Army Reserve and RAE word.

6 Troop – Sappers of La Trobe Valley

CAPT Shannon Garrett

As the Troop Commander of 6 Troop as part of, 10CES, 22 ER, I have the honour of being the Officer in Charge of the Newborough depot and the current Sappers of the La Trobe Valley. The Valley, has seen a lot change and activity over the past few years. The men and women of Newborough were known in recent times for their Forestry skills, with the capability to safely clear trees of all sizes in all conditions. This was most prominently displayed during the Black Saturday bush fires in 2009, as well as the professional conduct within the coops up at the town of Shelly Victoria, where the troops from Newborough were the primary force in the reconnaissance, felling, milling and reforestation of trees to assist with the reconstruction of the High Country Rail Trail in the area.

The past 10 years has seen a lot of change Army wide, including for 22 ER, with the focus moving back to the combat engineer (CE) role for Newborough. As with any change this was the catalyst for endings and new beginnings, and resulted in a turnover of personnel and a new generation soldiers coming in to focus on the CE skills. In all these changes the pride and comradeship still remains, as well as a longing for forestry tasks, which is bought on by the rural environment and the troop's love of all things wooden!

Top: EX SPUR WINTHROP Route and Area Search – CPL Place

Below: EX SPUR RETICLE Live Fire & Battle Shooting – LCPL Farbus

One of the most important tasks for the soldiers of Newborough, is the support they provide to the local community within the La Trobe Valley region. When requested by the local RSL's and soldier support groups, they are always ready to support these organisations with activities and commemorations. In the past year the troop has supported the Longwarry Long Tan Day service, the Moe RSL's Remembrance Day ceremony, and the traditional ANZAC Day services, which sees a call on all 6 TP members to journey to over seven services across the morning, supporting the local RSL's and community. Along with supplying a catafalque party for the service the troops from Newborough are also seen leading the parades around Newborough, Moe, Morwell and Yinaar. It makes for a busy day but with great reward when the soldiers and the Regiment receive thanks and admiration of the members of the local community and especially the veterans present.

6TP also hosted a "Dining Night" at the end of 2017. The night provided many wonderful opportunities for lots of reminiscing and catching up with old friends, but also for the members of

Top: Moe RSL Remembrance Day Service – SPR Scott Marriot, PTE Mark Micallef, SPR David Newberry, SPR Ethan Fenech

Above: Yinnar veterans march ANZAC Day – SPR Mark Micallef, SPR Ethan Fenech

Above: Newborough Sappers

Bottom: LCPL Christopher White fixing demolition charges on Ex SPUR HAYRICK.

6TP to display their dedication, professionalism and skills. In preparation for the night they constructed a NEB (Non Equipment Bridge), made from timber that had been harvested and milled by the troop, which stretched across the parade ground. The building inside and out was adorned with some fancy chainsaw displays which underlined the Newborough connection and history with forestry, as well as some more traditional RAE displays throughout the grounds between the YAARC mess and the Dining Room. The Dining Room, which in its normal state is the main lecture room, was entered thru a camouflaged lit tunnel ending in a display dedicated to Sapper's forestry capabilities.

The night was an opportunity to acknowledge members who had recently retired, including the presentation of the Silver Sapper award to CPL Travis McIness for over 20 years' service to the Royal Australian Engineers.

The commitment of the troop doesn't end there, each 22 ER training weekend the soldiers from Newborough are always very well represented considering our numbers. They pile into the bus, Hilux and/or Mog to make the three and a half hour journey to Puckapunyal to participate in training to utilise and enhance their engineer skills and knowledge.

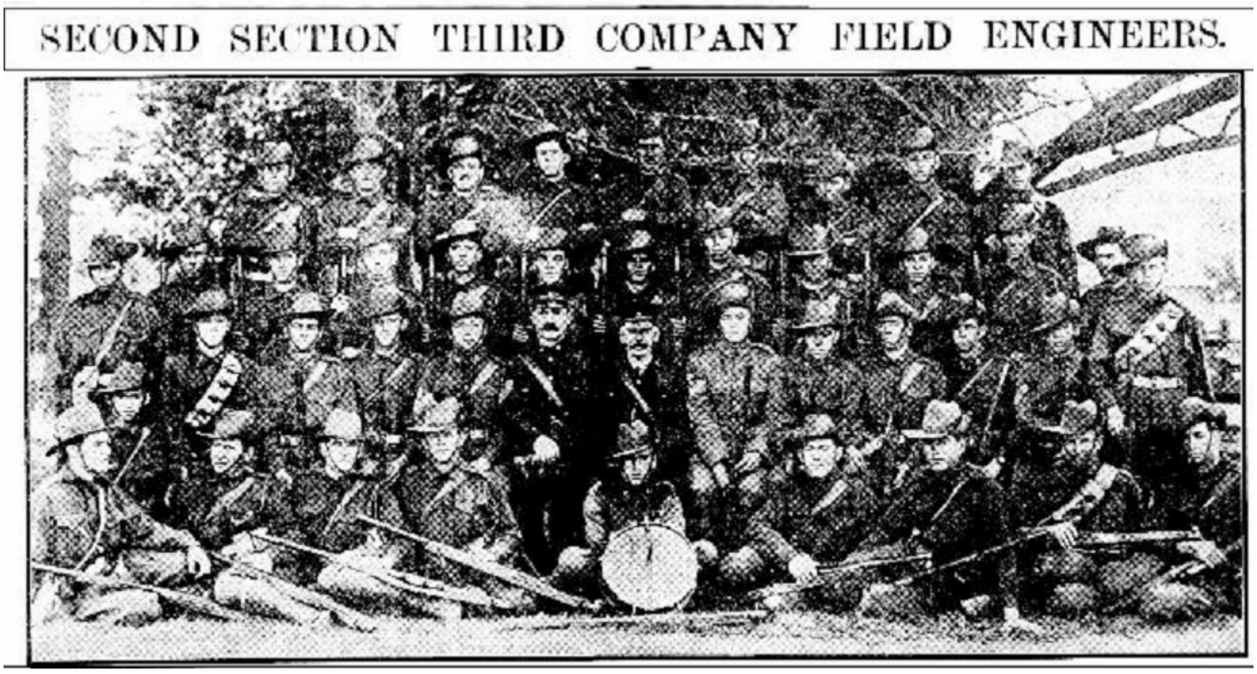
Although displaced from the rest of our call sign by a large distance, and the necessity often to travel many hours to participate in Regimental exercises and activities, the troops happily do it for the love of being a Sapper and their army family.

As I outlined earlier 6TP is going through a rebuilding phase, and although recruitment is starting to bring in new faces and characters to the team, we need the Valley family to grow, to ensure it remains viable and to further develop our 22ER's engineer capability in the La Trobe Valley Area.

[**Sapper SITREP**]

3rd Field Squadron

MAJ Patrick Trainor



3 Fd Celebrates 70 Years

This year the Unit celebrates 70 Years since the formation of 3rd Field Squadron (3 Fd Sqn), Citizen Military Forces. 3 Fd Sqn Citizen Military Forces was formed on 1st April 1948, and its first Officer-in-Command was Major RW Charlton. MAJ Charlton enlisted whilst it was still 3rd Field Company Australian Engineers and built upon the heritage established from the unit who were originally formed in September 1914 for World War 1. At that time the unit comprised of 4 Sections, with each section made up of 1 Officer and 43 men, coming from Tasmania, Queensland, South Australia and Western Australia. In a skirmish, which predated the Gallipoli landings, 3rd Field Company was the first to come under fire while developing the defences on the Suez Canal, on 13 February 1915. The unit also went on to serve at Gallipoli and other campaigns in World War 1.

As reported by CEW Bean on 03 March 1915, one British Officer comments on 3rd Field Company:

"While this Company is the only part of the Australian Force which so far has been engaged in actual work in the field of operations. A question lately arose as to whether the third company might be required elsewhere, and it was suggested that possibly another company might be substituted. The British Officer under whose command they were working once put in a strong objection "I sincerely hope you are not going to take this Company from me until the present strife is over" he wrote. "They are simply too invaluable, both officers and men and having thoroughly earned the excellent reputation they have already required everywhere they have been. They have worked until 2-30AM by moonlight. Their work has all been excellent, the men have been delighted by their work and have been exemplary in the conduct. Even if you can produce other Companies as good, I should rather be in a hole if Number 3 were to be taken away".

3 Fd Sqn became independent from 7th Field Engineer Regiment in 1991 and under command of 10/27 Royal South Australia Regiment in 2013. Seventy years on, 3 Fd Sqn Unit manning is at 100% and boasts an average attendance of 80% across the year. During 2018 the Unit commenced supporting 1 CER for the first time, and the experience has been extremely positive, with both units working hard to ensure the benefits are obtained from integration of ARES in support of ARA.

WPDS traininf during Ex PREDATORS RUN

During 2018, 3 Fd Sqn has sought to embrace the Chief of Army's direction to be brilliant at the basics, and our Corps motto of Ubique. Members of 3 Fd Sqn supported Rifle Company Butterworth 120 from December 2017 through to February 2018, where Sappers Jak and Lingood put their carpentry skills to use and built targetry whilst deployed among other Sappers within an infantry Rifle Company. The RMAF were grateful, and the targets remain in use.

In March, we deployed on Ex JACKA CRAWL and rehearsed CE section and Plant section tasks with 22 ER as part of Reinforcing BG JACKA. In April, members of 3 Fd Sqn inserted into CE Sections of 1 CER in Ex PREDATORS ADVENTURE as part of the lead up training continuum on the Road to War. We also sent WO2 Doug Royle and a couple of Sappers to support Ex PREDATORS ADVENTURE in the Flinders where WO2 Royle instructed in Adventure Training. During April we also revised engineer support to the Company in Defence and showed our RAINF cousins what engineer wiring and deception measures sappers are capable of producing to assist them.

In May and June, training commenced in support of OPLAN MAGPIE domestic security response. During July our planties supported 1 ARMD at Ex BOARS RUN. In August we trained 28 sappers in Basic and Intermediate chainsaw and tree felling.

Exercise PREDATORS RUN

During September, 3 Fd Sqn and 22 ER combined as the BG JACKA Engineer Squadron to support 1 CER at Exercise PREDATORS RUN at Cultana. Phase 1 involved plant operators establishing an anti-tank ditch as part of the overall Exercise to test Combat Team commanders in negotiating a gap crossing. The anti-tank ditch was 1.4km in length and took a team of planty's about a 1 week to prepare. Each of the mech Combat Teams

Plant Tp starts a 1.4Km tank ditch during Ex PREDATORS RUN

had an opportunity to prepare and deliver snap orders under an exercise threat environment to traverse the enormous obstacle. While Sapper Rick Hale was busy assisting with the construction of this obstacle, Sappers Matthew Lohmeyer and Michael Toubia attended a course a qualification course on operation of the Mack Dump truck.

Phase 2 of the exercise was raising, training and sustaining core Combat Engineer skills. 1 CER established some very effective training in the Water Purification and Desalination (WPDS) system. Several sappers came away with a rare qualification in setup and operation of this complicated piece of engineer equipment which is used to make drinkable water from either saline or other non-potable water sources. The WPDS can be employed during HADR response and is often used on Australian Army Capability Assistance Programs (AACAP) for producing water in remote locations.

Our Sappers also participated in some Mentoring Team Training (MTT) run by 1 CER in the Route Clearance Package (Search). They received some top-notch mentoring on route search from some very experienced and qualified NCO's.

In addition, our Sappers received capability briefings and demonstrations in Engineer Emergency Response, Engineer Detection Dog Teams, Engineer Reconnaissance, and revision in the Harris radio and communications, all in preparation to support 1 CER at Exercise Talisman Sabre in 2019.

WW1 Memorial discovered

This year while researching a speech to commemorate 70 Years since the formation of 3 Fd Sqn, I discovered a long-forgotten WW1 memorial that came about by the direct efforts of LTCOL Stanley Holm Watson CBE, DSO, MC, ED. (1887-1985). LTCOL Watson, a railway engineer, was born on 24 October 1887 at Parkside, Adelaide.

Refurbished Railway Memorial

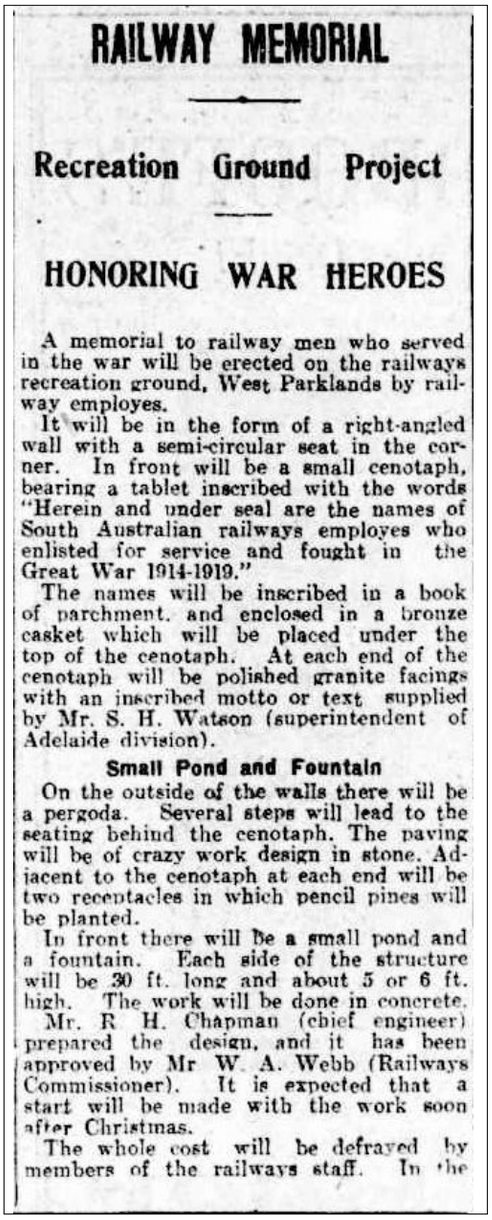
He entered WW1 as a railway draftsman, and upon return was employed in the South Australian Railways Department where he became the Deputy Commissioner of the South Australian Railways.

In the late 1920's, he was instrumental in the planning and establishment of a Memorial to remember railway workers who had served in WW1. On 4th October 1930, a memorial was unveiled by the Governor of South Australia (Sir Alexander Hore-Ruthven VC) to remember railway workers who had made the ultimate sacrifice in the Great War. The memorial was realised through the efforts of LTCOL Watson who collected donations from SA Railway employees for the monument, purchased the original bronze lettering himself, and who sealed the casket at the inaugural dedication ceremony.

The memorial is located on Park 25 in central Adelaide which was the then recreational reserve of the South Australian Railways Department. It is constructed from stone leftover from the building of original Adelaide Railway Station.

For many years following its construction, the memorial was looked after by the SA Railways RSL Sub Branch. After the closure of this branch in 2010, care of this memorial has been transferred to the City of Adelaide.

The City of Adelaide has recently been made aware of the significance of this memorial and has started to refurbish it. Ubique



RAILWAY MEMORIAL

Recreation Ground Project

HONORING WAR HEROES

A memorial to railway men who served in the war will be erected on the railways recreation ground, West Parklands by railway employes.

It will be in the form of a right-angled wall with a semi-circular seat in the corner. In front will be a small cenotaph, bearing a tablet inscribed with the words "Herein and under seal are the names of South Australian railways employes who enlisted for service and fought in the Great War 1914-1919."

The names will be inscribed in a book of parchment, and enclosed in a bronze casket which will be placed under the top of the cenotaph. At each end of the cenotaph will be polished granite facings with an inscribed motto or text supplied by Mr. S. H. Watson (superintendent of Adelaide division).

Small Pond and Fountain

On the outside of the walls there will be a pergoda. Several steps will lead to the seating behind the cenotaph. The paving will be of crazy work design in stone. Adjacent to the cenotaph at each end will be two receptacles in which pencil pines will be planted.

In front there will be a small pond and a fountain. Each side of the structure will be 30 ft. long and about 5 or 6 ft. high. The work will be done in concrete.

Mr. R H. Chapman (chief engineer) prepared the design, and it has been approved by Mr W. A. Webb (Railways Commissioner). It is expected that a start will be made with the work soon after Christmas.

The whole cost will be defrayed by members of the railways staff. In the

[**Sapper SITREP**]

13 Field Squadron

MAJ Daniel Kennedy-Stiff

Watermanship activity at Wellington dam

Just like the West Coast Eagles football team, 13 Field Squadron has had a superb 2018. Under the leadership of new OC MAJ Daniel Kennedy-Stiff and SSM WO2 Glen Donaldson the Sqn has been a hive of activity with training exercises, deployments and courses occurring throughout the year. The Sqn has continued its strong retention and recruiting rates and now has more parading members than it has had in a long time, leading to increased capability, even at a time when the Sqn is committing to a number of deployments and exercises. There were a number of well-deserved promotions of longstanding unit members including Chris Gallen to SGT and Mark Richards and Andrew Malland to CPL.

The Sqn's alignment with ARA partner unit 3 CER remains strong with a visit by 3 CER CO and staff, as well as the running of a combined training course (advanced tree felling). Planning has already begun for combined activities in 2019.

The Sqn has contributed strongly to national deployments with 5 members on the Transit Security Element for Op RESOLUTE rotation 89 as well as a number of members being deployed to Rifle Company Butterworth in Malaysia. SPR Tim Lowndes along with SPR Malcom Stewart CSM, once again deployed on the Army Aboriginal Community Assistance Programme, something Stewy has done every year for well over a decade. Various other members have supported numerous activities and courses throughout Australia including for SME and 8 Bde.

Unit training exercises focused on search, obstacle construction, engineer demolitions and watermanship. In April the unit conducted watermanship exercises with 16 RWAR at Wellington dam in the state's South West. Despite environmental and equipment challenges good training outcomes were achieved. Alternative means of propulsion (paddles) were tested in a night time boat race won by the only team lead by a Sapper – well done SPR Van Der Woude and crew. On Ex AMIENS in the middle of the year the Sqn, including plant elements operated by 3 troop, constructed obstacles which were later explosively breached. In September the Sqn conducted white role search training in a civilian aviation hanger in Jandakot. October saw the Sqn conduct a reserved demolitions exercise on the Garden Island Causeway which simultaneously tested skills in watermanship and placing, fixing and maintaining a reserved demolition.

Members of 13FDSQN and 3 CER advanced tree felling course

Advanced Tree Felling course

As the unit started to focus once again on the individual skill set the sqn set out to expand our tree felling know-how. With the assistance of 3 CER, several members braved the chilly York mornings (more so for our Townsville colleagues who enjoyed a balmy 1° start to the day) to learn the art of plunge cutting and the joys of chopping large trees into small pieces before placing them neatly in a pile. The skills learnt have provided the unit with greater capability when it comes to winning local resources and enhancing overall training objectives. The collaboration with 3 CER enabled positive outcomes for both organisations and set the scene for potential future courses. Thanks to SGT Jamie Tollan and his team for making the trek west.

Plant courses

The Sqn conducted plant courses over the period 11 – 26 Aug 18 in the Bindoon Military Training Area. The courses conducted were Excavator, Skid Steer Loader (SSL) and Dozer Operator with a total of 8 trainees spread across the three courses.

The theory phase was conducted at Irwin Barracks and the practical phase at the Bindoon Training Area. The CORE 24 Program was engaged for hire equipment which gave access to enough equipment to conduct the training and for unit members to be exposed to larger sized excavator operations and also tracked SSL operations. The courses concluded with a series of complex excavations focusing on interoperability between equipment. The trainees obtained a high level of skill due to building on skills previously gained during unit exercises and plant courses.

Bus Shelter Art Installation (Ellis)

Mr. Ramsay, former president of the Vietnam Veterans Association of WA and current president of the Friends of Anzac cottage, contacted the Sqn to request their help and support in a collaborative effort with 3rd Field Squadron, 2nd Engineer Regiment, Royal New Zealand Engineers. The aim was to create an art installation piece at two bus shelters in Mt. Hawthorn, Perth, WA to depict the battles fought in both Gallipoli during WWI as well as our involvement in the Vietnam War.

The project included materials associated with the bunkers of wartime such as sandbags, timber, and corrugated iron. Sandbags filled with concrete were used to make the base for a bench seat. Reclaimed jarrah timber was then fixed on top of the concrete sandbag blocks, creating a bench. When it came to incorporating the corrugated iron into the project, the team constructed a timber frame under the roof and attached the iron sheets to the underside. This gave the project a rustic feel, symbolising and recreating historical wartime bunkers. The final touch to the project was by artist Drew Straker's rendition of both Gallipoli and Vietnam in the form of a wall mural.

Outlook

Next year the sqn will be in reset mode which will allow the training to focus on fundamental Sapper skills. Planned training exercises include non-equipment bridging, engineer search and watermanship. Links with 3 CER will be maintained through exchange of personnel on training exercises and courses.

Art installation on bus shelters by SPR Ellis, SGT Bellis, SPR Johnson (pictured above)

[**Sapper SITREP**]

Army Dive Wing, ADF Diving School

WO2 Dave Wallace

In 2018, the Army Dive Wing focused all resources into producing the next generation of Combat Engineer Divers. This included strong support from the CERs, ERs and FD SQNs whom without their assistance the Army Dive Wing would not have been able to successfully qualify forty-three Army Work Divers and Supervisors over eight months of high tempo training.

With the intention of remembering Army diving heritage, the Army Dive Wing sought to reconnect with RAE. This began by placing course photos of sappers within prominent positions around the ADF Diving School. Other initiatives included the publishing of photos and articles of Combat Engineer Divers executing diving operations, the uncovering of the RAE Corps badge in the ADF Diving School foyer and the inclusion of the inaugural Army Dive Wing article in the Sappers Magazine.

As we move toward 2019, the Wing will continue to review course training methods in line with curriculum, to focus on flexible, robust and employable divers into the future. The Army Dive Wing will be prepared to continue to train and mentor up to 70 trainees per year, with the continued support of the Corps, the ADF Diving School and dedication from the Army Dive Wing staff.

Sapper of the 0032 Army Work Diver Course, Preparing for a contaminated water dive

[**Sapper SITREP**]

Special Operations Engineer Regiment

From the Commanding Officer

An SOE Team wait to be dispatched from the RAAF C17 over the coast of Guam.

In 2018, the Special Operations Engineer Regiment has continued on a pathway of rapid evolution and has achieved many successes. In late 2017, the Regiment restructured and adopted a new Operational Readiness Cycle (ORC). The restructure and realignment enabled SOER to create necessary efficiencies within a high tempo OPGEN/FORGEN Cycle. Of the two Special Operations Engineer Squadrons:

- Alpha Squadron (A Sqn), with threshold capability, provides dedicated support to the 2nd Commando Regiment
- Bravo Squadron (B Sqn), with enhanced capability, provides integral support to the Special Air Service Regiment and other niche missions.

Alpha Squadron

Following the Regiment re-structure, the Squadron was charged with three Lines of Operation (LOO), including Domestic Counter-Terrorism (DCT), Contingency and Campaign. Generally, this requires a Troop to be integrated with a Company from the 2nd Commando Regiment but at other times conducts exercises independently or with our international partners. A significant achievement for the Sqn this year was assuming the responsibilities associated with the LOO after the restructure. A Sqn also integrates new members who successfully complete the Reinforcement Training Cycle (RTC) into the Troops and then further develops them with specialist training aligned to their supported LOO, a key aspect of the new SOER ORC.

An SOE Operator conducts sampling of an adversary CBR production process during an International Exercise

The key operational activities for this year included continued support to Special Operations Task Group (SOTG) efforts in the Middle East, and support to DCT efforts during the 2018 Commonwealth Games and Invictus Games. International Engagement activities and exercises included the projection of the Contingency Troop to Guam, which involved a parachute insertion and airfield seizure, roping insertion aboard a Merchant Ship and subsequent recovery of a radioactive source. The Sqn also hosted members of Canadian Special Operations Command, an annual joint activity between the two Commands focussing on technical specialist search and exploitation. It has been an incredibly busy but successful year for the Sqn, and it doesn't look like tempo will slow anytime soon.

Bravo Squadron

B Sqn have also continued to reach new heights this year, conducting both technical specialist training in C-WME and providing dedicated C-CBRNE support to SASR. Similar to A Sqn, B Sqn has continued to support niche DACC tasks throughout the year, most notably support to the 2018 Commonwealth Games. B Sqn have also conducted enduring operations in the Middle East Region, by supporting the continuous rotation to the Captured Enemy Material Force Element. With one troop continuously deployed, the other troops have been busy conducting exercises and engagements with peer forces from the five eyes SOF community, in the United States and United Kingdom.

B Sqn has key personnel which sit on the Australia, New Zealand Counter Terrorism Committee (ANZCTC), focussing on CBR engagement at a state and federal level. The Sqn saw heavy involvement in the development and implementation of the Queensland based multi-national exercise this year, which included involvement from the United States, United Kingdom, and Canada. It was acknowledged on a national and global stage that the SOE Operator brings a breadth of knowledge, experience and skill sets which cover multiple disciplines, complimenting explosive, forensics and HAZMAT in support of a Joint Hazard Response Team.

A year in the life of a Special Operations Engineer Sapper

Life after Reo in a Threshold Troop

Expectations following the completion of Reinforcement Training Cycle (RTC) are highly demanding but equally rewarding, however, members are well prepared to execute their role within the Troop. Just three days after finishing the SOER RTC two members of Two Troop, A Sqn were selected to deploy on an exercise in Canada; a joint exercise with elements of the Canadian Special Forces, focusing on CBRN sampling and exploitation.

This is just a fraction of what to expect when you finish the RTC. Prior to Christmas stand-down, the same two members were also involved in two further International Engagement activities with the Indian Para Special Forces and the Indonesian Special Forces (Kopassus). Engagement with regional partners is a key ongoing SOER activity and despite only recently finishing RTC, members were able to pass on some vital skills in expedient CIED and exploitation techniques.

Following stand-down many members of the 2017 RTC conducted a sequence of operations and exercises

SOE fast rope onto a US Merchant Navy Ship off the coast of Guam, prior to recovering a live radiation source.

for Domestic Counter Terrorism support to the 2018 Commonwealth Games. The Troop had to balance component training against two Lines of Operation, Contingency and Domestic Counter Terrorism. This gave the opportunity for the Troop to further develop the team's skills and flexibility at an early stage in the year, enabling excellent integration with the Commando Company Group (CCG) from the outset.

On completion of support to the Commonwealth Games, the Troop refocussed on the requirements for Contingency operations, a challenging profile. Some of the training consisted of operating in a high CBRNE threat scenario, and also required the Troop to test their insertions skills with the Commando Company. During one of the exercises, the Troop successfully neutralised a Chemical Weapons and HME lab, prior to a rapid foot exfil in MOPP gear.

Being part of SOCOMD means also supporting large Joint Land Combat Exercises, so to support the integrated Sea Land Series the Troop had to quickly refit to fight and jump on a RAAF flight to Brisbane, staging out of Amberley. The Troop enabled deep strike and HVI mission sets, typical operations conducted by SOCOMD FE. This also consisted of vital planning and preparation to a number of complex missions conducted by the FE.

The Sea Land Series proved to be a good opportunity to practice necessary skills in preparation for future Contingency tasks. The Troop re-postured in preparation for an offshore exercise, a highlight of the year for most of the Troop. This exercise was the biennial engagement with US Navy Mobile Unit 5, in the United States territory of Guam. The exercise began with a fully enabled Squadron minus force project from Amberley to Guam by C17, followed by a parachute insertion and airfield seizure. The Troop were parachuted off the coast of Guam and finned approximately one kilometre to the RV with the MU5 platoon. From there, the Troop moved inland and completed a marry-up with a separate SF element, prior to assaulting the airfield and clearing it of explosive hazards.

The remainder of the two-week exercise in Guam consisted of a number of Full Mission Profiles and component training with MU5. Scenarios included air mobile components, fast roping, hostage recovery and the culminating activity consisted of the Troop fast-roping onto a US Merchant Navy cargo ship to neutralise a number of enemy combatants and recover a radioactive source.

To round out the year the Troop hosted elements of the Canadian Special Forces on the Australian leg of the bilateral engagement between the two Commands. The activity was conducted across Sydney and Canberra and supported by the Defence Science and Technology Group and other force enablers. This exercise was an excellent opportunity for the Troop to showcase the capability they have built together throughout the year and test it during highly complex Full Mission Profiles with a peer force.

Interested in a career in SOER?

The Special Operations Training and Education Centre (SOTEC) screens, via a diagnostic assessment, candidates to determine suitability to serve in SOER and SOCOMD. This means that suitable candidates have been psychologically, physically and mentally screened to a SOCOMD entry standard. They are then placed into an order of merit and undergo a final board, chaired by CO SOER, prior to having their names forwarded to CMA.

The screening process continues to evolve and has seen significant improvement over the last few years, with valued input from SOTEC and other parts of SOCOMD. The Reinforcement Training Cycle (RTC) has also continued to evolve from an initial six months duration in 2010, to what is now a 12 month training

An SOE practices room clearance drills, an essential skill learnt during the Tactical Integration Course during the Reinforcement Cycle.

continuum. This course not only teaches specialist C-CBRNE skills but also tactical integration, insertion and operational skills that enable a Special Operations Engineer (SOE) to integrate seamlessly into a Special Operations Joint Task Force or Group.

SOER has had reinforcement training since its inception. This has traditionally been conducted by the SOER Training Cell but in 2019 this will change. The RTC has matured to a 12 month training continuum including weapons packages, insertion skills (including parachuting and roping) and SOER specific courses (including technical search and impedance to assault reduction). As of January 2019, the RTC will be delivered from a dedicated SOE Training Wing at SOTEC; another significant indication of the Regiment's rapid evolution. The SOETW will be responsible for the annual Diagnostic Assessment process and implementation of the RTC. Those candidates who successfully complete the RTC will then post into SOER from SOTEC. Unsuccessful or unsuitable candidates may be returned to their parent unit or posted in accordance with service need.

The Diagnostic Assessment will be conducted by the SOETW and consists of both physical and aptitude testing. The assessment is conducted over one day and includes capability briefs, aptitude and physical testing. Candidates can expect to be tested continuously throughout and after the physical component as this replicates the requirement for a soldier or officer to be able to develop workable plans whilst physically degraded.

The Special Forces Entry Test (SFET) is the primary indicator of a candidate's fitness and overall preparation. The SFET consists of cadence push ups & heaves, 3.2km webbing & rifle run in boots, 5km pack march and 400m swim in cams. Maximum effort is expected with priority weighting going towards those members that have superior preparation and performance.

Applications are keenly sought as SOER is always seeking fit, motivated and intelligent candidates. If you are interested in a career as a Special Operations Engineer, you are encouraged to seek further information on the SOTEC website (from the DRN, search Special Operations Engineer Regiment).

Should you be successful in your application and the RTC, you will be exposed to a range of capabilities and opportunities only available to those within SOCOMD. You will support Lines of Operation that have strategic consequences. You will join a Regiment that is utterly unique, has a proud history and a strong sense of identity.

SOE integrated with SF FE as they conduct Maritime Counter Terrorism insertion via Ribs and S70's. Each SOE is required to maintain multiple insertion skills to integrate with the SF FE.

[**A paper**]

The Mobile Training Team Construct: An Engineer Perspective

LT Hannah Ryall - 3rd Combat Engineer Regiment

"Give a man a fish and you feed him for a day; teach a man to fish and you feed him for a lifetime" – Maimonides

Background

The Royal Australian Engineers (RAE) is a unique but beautiful beast. Both proactive and readily reactive, RAE is multi-faceted, equipped, specialised and supportive. The Corps prides itself on its broad span of capability; but more specifically, on its ability to employ that capability to effectively enable the Combat Brigade to fight and progress.

The enablement and support that the Corps provides aligns with the 2016 Defence White Paper's strategic objectives for the Australian Defence Force (ADF).[1] They are as follows:

- To deter, deny and defeat any attempt by a hostile country or non-state actor to attack, threaten or coerce Australia
- To support the security of maritime South East Asia and support the governments of Papua New Guinea, Timor-Leste and of Pacific Island countries to build and strengthen their security
- The third is to provide meaningful contributions to the global responses to address threats to the rules-based global order that threaten Australia and its interests.

With this in mind, the ADF have utilised Mobile Training Teams (MTTs) as a streamline method of training delivery and skillset development. The MTT bodes well as a support and enabling mechanism IAW aforementioned Defence strategic objectives. In recent years, the Corps have raised and deployed numerous engineer-based MTTs to deliver specialist training with favourable results.

Aim

The aim of this essay is to discuss the utilisation of the MTT construct from an engineer perspective. It will detail how engineer MTTs have recently been employed and provide recommendations to better future implementation.

Scope

This essay will first define the engineer MTT and its structure before exploring an engineer MTT case study. The essay will then extend upon engineer MTT employment opportunities and recommendations including but not limited to; the characteristics of the MTT engineer, mission command and junior leader empowerment.

The Engineer MTT

A MTT can be defined as a deliberate and continuous team effort deployed to give instruction and develop a self-training capability of a particular skillset.[2] The ADF have deployed MTTs to provide training, mentoring and instruction, particularly to the South East Asia region, for decades. MTTs can be rotational, periodic or a 'one-off' training opportunity dependent on the nature of training, reception of instruction, relevance and necessity, host-nation relationship, resource intensity and prearrangement.

Most namely, Rifle Company Butterworth (RCB) is a three-month rotational MTT of enduring nature. Since November 1970, the ADF have deployed an infantry rifle company with enabling assets to Butterworth

1 Defence White Paper, 2016 p.1.

2 John C. Morey et al., "Best Practice for Using Mobile Training Teams to Deliver Education Courses", January 2009

in Penang, Malaysia.[3] Typically, the rotation provides the rifle company exposure in the unfamiliar jungle environment. However, in recent years, the Company in country have implemented cross-training on Exercises HARINGGAROO and CHAPEL GOLD. The training program is subject to change each rotation but has recently included the instruction of Standard Operating Procedures (SOPs) prior to Australian embedment within a Malaysian company in a week-long field consolidation exercise.

RAE have significant experience in the conduct of construction based MTTs, similar in annual regularity of RCB. Exercise PUK PUK, conducted by 3 CER, has developed the capacity of the Papua New Guinea Defence Force (PNGDF) in the delivery of infrastructure support. Similarly, 1 CER develop facilities and training areas on Exercise HARII HAMUTUK in Timor Leste. The Corps have contributed to the partnered generation of engineer capability for many years with positive outcomes and skillset development. Such MTTs have forged a template for the conduct of traditional combat engineer instruction; including engineer force preparation and logistics management.

Whilst RAE have significant experience in construction based MTTs, the Corps is relatively new to the provision of combat engineer instruction through the conduct of a MTT. An engineer MTT cannot mirror the training provided by an infantry MTT due to our comprehensive capability span, specialist skillset and resource heavy nature. In essence, infantry is comparatively homogeneous, whilst we are diverse. In this regard, an engineer MTT is required to tailor a streamlined training package that aims to instruct on two to three areas of combat engineering capability and/or specialist engineering.

- An engineer MTT can deploy to develop the host-nation's basic combat engineer skillset. The combat engineer skillset is very broad and a training package could take months if not refined. As such, a review should be conducted of the host-nation's knowledge base and requirements. This will determine two to three areas of combat engineering that can be instructed upon (e.g. search and demolitions). The MTT package will model from month-long search and demolitions curriculums provided at the School of Military Engineering (SME). As such, the training package is drawn from multiple LMP's to provide appropriate and effective foundation training for the audience.
- Alternatively, the MTT can provide career course training to a host-nation. This training will span multiple realms of combat engineering whilst progressing the participant within their rank.
- An engineer MTT can be deployed to provide specialist training (dive, high-risk search, Explosive Detection Dog training, horizontal and vertical construction, explosive urban breaching). The host-nation will have a specialist wing and SOPs. The MTT will seek to progress their current training standard whilst mutually learning from the host-nation's implemented training.

The structure and size of the training team is dependent on the audience, necessitated safety ratios and training to be delivered. Commonly, an engineer MTT is of Troop-minus or section strength. A MTT of 15 personnel or less sets the conditions for intimate, targeted engineer training. An engineer MTT of this size is practical, manoeuvrable and without a significant logistic footprint.

The variation in deployable engineer MTTs generates paralleled variation in manning. At a minimum, an engineer MTT force configuration requires a Troop Commander (LT) and/or Troop Sergeant. A Troop Headquarters (TP HQ) element guides the operation and provides a mission, lines of effort, training objectives and desired outcomes. The Troop Commander constructs and coordinates the training program whilst acting as a Liaison Officer to the host-nation. The Troop Sergeant's primary role is resource management, lesson delivery and oversight of the MTT instruction.

A Junior Non-Commissioned Officer (JNCO) and a specified number of Sappers are required to man the instructional basis of the engineer MTT. Engineer instruction is arguably best delivered at the CPL-SGT level

3 The Royal Australian Regiment Association – South Australia, 2014

Case Study
Urban Search and Breach MTT – Land MTT: OP AUGURY, the Philippines

In October 2017, the Army deployed a number of MTTs to the Philippines following the Battle of Marawi. The ongoing conflict against the Islamic State of the Philippines (IS-P) saw Army force elements (FE) assigned to JTG 629 – OP AUGURY as a part of a broader joint effort.

OP AUGURY continues in the Philippine region with air, land and sea MTTs supporting the prevention and preparation against terrorist threats. It further supports the capability development of the Armed Forces of the Philippines (AFoP).

The Land MTT, in particular, aims to improve the AFoP's lethality and survivability within the urban environment. During 3rd Brigade's rotation, the Land MTT was primarily comprised of personnel from 1st Battalion, Royal Australian Regiment (1 RAR), 3rd Combat Engineer Regiment (3 CER), 1st Close Health Battalion (1 CHB) and 4th Regiment (4 REGT). The Land MTT contained the following sub-set MTTs:

- Urban Close Combat (1 RAR)
- Urban Sniping and Counter-Sniping (1 RAR)
- Urban Search and Breach (3 CER)
- Combat Trauma (1 CHB)
- Urban Joint Fires (4 REGT)

3 CER conducted the Urban Search and Breach MTT (USB MTT) from October 2017 – June 2018 prior to handing over to the 7th Brigade. The USB package was designed by the deploying Troop Commander and Troop Sergeant. They designed and conducted a three-week training program encompassing a week each of Explosive Hazard Awareness Training (EHAT), search and demolitions.

In March 2018, the inaugural USB C2 Advise package was trialled. This package was delivered concurrently to the USB Package and focussed on planning considerations and the C2 element of combat engineering. This effort was delivered to Officers and Senior Non Commissioned Officer's (SNCO's) of the AFoP who had already undertaken the standard USB MTT Package. The intent of the USB C2 Advise Package was to develop the combat engineer capability through targeted instruction to engineer commanders. In essence, the USB MTT was the "how to" and the C2 Advise was the "how to employ".

The USB MTT was stark in contrast to other MTTs of the Land MTT because of the baseline knowledge of the USB AFoP audience. The USB MTT are not refining a force with an established training foundation alike Urban Close Combat (infantry) or Combat Trauma (medics). The AFoP do not have a discrete combat engineer capability comparative to the ADF. Instead they hold an embryonic engineer capability that is yet to be developed and/or integrated into a combined arms framework. Their remaining engineers are primarily construction engineers working in response to Humanitarian Assistance and Disaster Relief (HADR) events or employed in search and rescue operations.

During the Marawi Siege, the combat engineer deficiency was recognised. AFoP infantry and engineers were hindered by the synchronisation of command and control structures, the application of combined arms and the unfamiliarity of the urban environment and asymmetric threat. They were unable rapidly reduce explosive hazards and IEDs causing slow progression in the clearance of IS-P strongholds.

The USB MTT comprised of a Troop Commander and Troop Sergeant. The instructional muscle included two CPLs, two LCPLs and nine sappers. This allowed for the USB MTT to work in two separate locations in order to deliver the standard USB MTT Package concurrently to the USB C2 Advise Package.

The USB delivered by 3 CER was very well received. The AFoP participants were eager participants, keen to improve and/or develop a combat engineer skillset. They were active learners who practiced and asked questions. The AFoP participants learnt best through visual learning – the practical demonstrations by the sappers encapsulated the verbal instruction. Over a three-week period, a specialist but baseline engineer skillset was able to be delivered to a group with little exposure to combat engineering.

The USB MTT was intimate, versatile and manoeuvrable. There was ample changeability in rank allowing for LCPL through to LT to provide instruction to the training audience. Furthermore, the training program could be moulded from a comprehensive three-week package to a ten-day package if time constrained. The intimacy of the 3 CER team and the small size of the target audience set the conditions for effective mentoring. The engineer MTT was able to translate challenging engineer proficiencies into understandable blocks of learning facilitated by meaningful relationships and mutual respect.

complemented by a collection of sappers providing practical demonstrations, one-on-one training and immediate fault correction. A MTT of this size and structure can comfortably provide instruction to 30 - 40 personnel due to the ample instructor to student ratio and allocated demonstration sub-team.

The effective MTT Engineer

Flexibility. Distinct from infantry MTTs who are well-practiced in the instruction of defined Combat Shooting packages, engineer MTTs do not have a 'package' that can be delivered at short notice in accordance with an LMP or TMP. Instead, the engineer MTT lead has the opportunity to develop an appropriate course of action for training that nests within the intent of the commander. The training program is taken from excerpts of SME lessons, LMPs and TMPs; it has an element of flexibility to be shaped to suit the audience and can be readily modified. More so, engineer instructors are malleable. They are ready to be reallocated and re-tasked; they are well-equipped at short notice.

Above all other characteristics, engineers must be mentally, physically and technically flexible. Noting the time required to reconfigure, regroup and relocate personnel and equipment; engineer groupings are modular in structure to enable rapid transition between mission with the personnel and equipment available. This purpose underpins the engineer requirement for a high level of multiskilling and the ability to be effective soldiers.[1]

Gauging the information feed. Further, the highly technical nature of the Corps presents the engineer MTT an abundance of information. The key limitation to this is the time in which an individual can deliver it. It is often that an instructor may want to equip the participant with all that they know, but there is risk in information overload. The TP HQ and Section Commander are required to assess lesson relevance with added caution – whether they will value add, make sense and progress the participant. As such, it is best practice to continually review engineer training delivered to the host nation and streamline as required.

Mutual learning. The opportunities when operating on an international platform, as mentors and advisors yet equals, are vast and mutually beneficial. When mentoring and developing engineer capability, often the most satisfying output for the instructor is the participant grasping and understanding the training being provided. If each individual approaches the engineer MTT training opportunity with a willingness to learn and share information; it is highly likely they will have heightened job satisfaction and will have made a significant imprint.

Empowering The Junior Leader

The engineer MTT is an embodiment of the 'centralised control with decentralised execution' RAE principle of employment. As detailed in Land Warfare Doctrine 3-6-1 Employment of Engineers;

> The most efficient results are achieved using centralised control at the highest appropriate level, with responsibility for tactical execution decentralised and delegated at the lowest practical level.[2]

Investment in the JNCO is crucial within the engineer MTT construct. The junior leader is the 'lynch-pin' of the deployed FE. They have the most frequent contact with the training audience, are able to build robust relationships and capable of instructing independently due to their knowledge base. In order for the JNCO to work effectively independently, the commander must engender mutual trust through the provision of clear intent. An intent provides a focus for the JNCO and empowers the JNCO to target training objectives.

How do we empower the JNCO? How do we motivate our subordinates to do better? Can we engender passion within the job? The engineer JNCO is best empowered by encouraging their active participation and helping them advance. In an engineer MTT, satisfaction and passion for the job stems from integration and relationship building. Through participation, the JNCO will be most satisfied when they see their training value-add.

Conclusion

The engineer MTT construct is versatile due to a varied training audience and the RAE capability span. As such, it is not as easily employed in comparison to homogenous MTTs. The training program must be streamlined yet flexible and continually reviewed. Furthermore, the structure of the engineer MTT must allow for the vitality of the JNCO to produce positive output whilst embracing mutual learning opportunities.

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1 LWD 3-6-1 Employment of Engineers, Ch 1.

2 Ibid.

[**An article**]

Merging Reserve Lieutenants with ARA units for 12 months

LT Emma Watson - 3 CER

LT Harry Mitchell with 3 CER mascot SPR Woolesten Boorooma VI

Gap Year and FARO (First Appointment Reserve Officer commissioning Course) are Reserve Officer training schemes introducing pre-existing Reserve Officer Cadets and recently graduated Year 12 Students completing a gap year to commission into the Australian Army and complete full time service over a period of twelve months.

The Gap year program commenced with all gap year members completing basic military training at 1RTB. Once gap year participants completed their reserve training at 1RTB, they undertake the Reserve Officer Commissioning Course consisting of four training blocks. The first three training blocks were held at Singleton Military Barracks and are facilitated by Sydney University Regiment. This training is to test Officer Cadets' ability to understand and perform the role of a section 2IC, Section Commander and Platoon SGT. The final training block is over a four week period at Royal Military College, Duntroon where cadets demonstrate their ability to command a Platoon. Emma Watson, Julia Rigg, Aaron Zee, Thomas Booth and Harrison Mitchell successfully completed the training and graduated into the Royal Australian Engineers.

Upon graduating in July, they were posted to an ARA unit of their respective corps. This was to allow them to conduct training within a fully functioning unit to prepare them to take command in their Reserve Troop they would be returning to in January 2019

Above left (from left): LT Harry Mitchell, LT Emma Watson and LT Tom Booth enjoying their graduation from RMC-D and comissioning 7 July 18.

Above: LT Emma Watson discusses design concepts with students from St Patrick's College, Townsville during a community engagement activity promoting careers in STEM fields.

at their home locations. All LT's undertook their Regimental Officers Basic Course at the School of Military Engineering in September 2018.

LT's Emma Watson, Thomas Booth and Harrison Mitchell were posted to the 3rd Combat Engineer Regiment in July. The three Lieutenants in Townsville have had a variety of positive experiences within the regiment. To understand the mechanics of an Engineer Regiment work was predominately undertaken within RHQ, learning administrative and management skills that a Troop Commander requires.

To better understand the training required for a Troop, Army and the opportunities of full time service, there was an opportunity to participate in activities such as CBRND training, bridging, general combat engineer tasks and support roles. Emma Watson was fortunate enough to have the opportunity to provide support in a Squadron Ops position for a period of time as well as providing support to a Community Engagement activity to illustrate how the Royal Australian Engineers use Science, Technology, Engineering and Mathematics in day-to-day tasks at a local School.

Following their time at the 3rd CER, LT Watson will be transitioning to a Troop Commander role at 5th Engineer Regiment, Adamstown, NSW. LT Mitchell will be engaging in inactive service for six months to focus on first year university studies and LT Booth has accepted an offer to return to RMC after completing a Degree in Business at the Australian Defence Force Academy.

LT Zee and Rigg were posted to the 2nd CER as Squadron Operations Officers, gaining an invaluable understanding of how to plan and conduct training for Squadron level activities. Furthermore, partaking in a field exercise at Wide Bay Training Area in August, the experience was a great introduction to RAE capabilities, where demolitions, search and watermanship activities were undertaken. Other valuable experiences included learning how to use a chainsaw at Greenbank Training Area and imparting knowledge to Army Cadets during their annual exercise in Canungra. LT Zee will be posting as a Troop Commander to the 5th ER and LT Rigg will take up a Troop Commander role at the 11 ER in 2019.

All Lieutenants agree that their time within their respective Engineer Regiments has been extremely valuable in setting the preconditions to successfully serve in their respective careers as Officers in the Australian Army.

[**A paper**]

The Future Of Combat Engineer Dive: A Review Of Capability And Combined Arms Integration

LT Rob Taylor – 3rd CER

Background

In 2017, Lieutenant James Walsh provided a summary of the AWD capability and highlighted key characteristics and limitations affecting AWD tactical relevance within the Combat Brigade (CBT Bde). He proposed a number of key concepts and supporting recommendations that would enable AWD to not only adapt to an ever-evolving operational environment; but provide supported units with a relevant and effective capability enabling them to live, move and fight.[1]

AWD's foundation publication, LWP-CA (ENGR) 2-8-1, Army Work Diving, 2017 is currently in its draft stage after significant reappraisal and is expected to be released in late 2018. This revision is a significant amendment to the 2006 version and represents a substantial development to the doctrinal foundation of the AWD capability.

These three key documents form the nexus of adaptation for the AWD capability and set the conditions for further academic critique and analysis surrounding a relatively small but technical specialist skill that extended the provision of engineer effects below the surface of the water. Furthermore, in a small but important step toward achieving tactical relevance, the term Combat Engineer Dive (CED) will replace the existing terminology of AWD henceforth in this document.

Aim

The aim of this paper is to extend Lieutenant Walsh's 2017 analysis of the CED capability and provide further context to its tactical implementation within a combined arms organisation, particularly in support of the CBT Bde.

Scope

This paper will critically analyse the CED capability within the five combat engineer tasks of mobility support, counter mobility support, survivability support, sustainability support and Army emergency response[2]. Although CED tasks and capabilities in permissive environments will be briefly discussed, the focus of this paper is on the employment of CED within non-permissive environments in support of the CBT Bde. Where possible, the context surrounding the CED capability will be enhanced by referencing near peer equivalent doctrine and concepts of employment, outlining applicable case studies and demonstrating appropriate scenarios that both support and challenge the future employment of CED.

Mobility Support

Reconnaissance, Landing Site and River Crossing Operations. CED may be employed during the conduct of all stages of a wet gap crossing operation. From gap crossing reconnaissance through to obstacle reduction through to the marking and guiding of clear crossing points in preparation for follow-on forces, current doctrine and training enables CED to support the CBT Bde in these operations.

Current practice for engineer gap crossing reconnaissance sees measurements taken on the home and far bank as well as depth measurements taken across the gap utilising small boats to cross the gap IOT determine the suitability as a crossing site for follow-on forces. This not only increases the footprint of the reconnaissance force whilst conducting the task but assumes suitable locations are available to launch and retrieve water craft and that it is tactically acceptable to take such risks. The use of CED, integrated with a dismounted security

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1 Lieutenant James Walsh, 'Tactical Employment of Army Work Dive Capability within the Multi-Role Combat Brigade', Lavarack Papers 2017

2 These five tasks are specified of a CER in Major General McLachlan's 2017 'Concept for Employment of Army's Combat Brigade'. The only additional task specified, engineer C2 operations, will not be detailed in this paper as this would most likely see CED employed more specifically within an alternate task supporting the C2 function. For example, the CED capability to conduct underwater reconnaissance will be detailed under 'mobility support' even though it would also support Bde ISR operations.

force element, has the ability to conduct a full gap-crossing reconnaissance of both surface and sub-surface conditions quickly whilst vastly decreasing the vulnerability of the reconnaissance force through a decreased physical footprint.

Expeditionary Reconnaissance and Clearance (ERC) of opposed landing sites, such as ocean beaches, are currently the responsibility of Navy Clearance Divers whose support extends from 'the seaward approach to the back of beach' at which point responsibility is presumably handed over to the pre-landing force (PLF)[3]. A CED element integrated with such a force as the PLF would enable an early engineer reconnaissance effort, both of surface and sub-surface mobility PIR's and therefore inform more efficient decision making on suitable mobility corridors inland from the point of entry and associated improvements required for larger follow-on forces.

CED can insert to the objective via a mobility platform commensurate with the supported unit or can utilise a platform more appropriate for the task and tactical setting. For example, this year at the Rim of the Pacific Exercise, the 2nd Battalion, Royal Australian Regiment had the opportunity to test their amphibious insertion methods including helocasting from American CH-53 helicopters[4]. Canadian Combat Diving (the Canadian engineer dive capability) doctrine makes provisions for such insertion methods outlining key considerations, personnel required and procedures to enable the cast and recovery of divers from a helicopter platform[5]. Although this insertion method is one of many theoretically available to engineer reconnaissance forces, the reality of its suitability and utility will not be realised until it is tried and tested in combined arms training exercises.

Mobility support within the CBT Bde is arguably the engineer task that most emphasises the importance of a tactical posture and demands the greatest level of security when conducted in non-permissive environments. For this reason, it is in this function that CED has the greatest room for development and is the most likely area in which its utility will provide greatest effect to the CBT Bde. On the other side of the coin, engineer support to defensive actions has always been synonymous with obstacle emplacement and route denial on land however is rarely connected to similar effects underwater. CED has the ability to support the CBT Bde by extending these countermobility effects to the aquatic environment.

Countermobility Support

Obstacle Emplacement and Demolitions. Wet gap crossings present commanders with significant risk and depending on the size of the crossing, often require Battlegroup synchronisation and support to execute. Once the crossing site is selected, the crossing force must break up its formation in order to cross and therefore these operations represent a period of increased friction and vulnerability to a crossing force[6]. Rivers and other inland waterways represent significant natural obstacles to manoeuvring forces and are very often used to shape combined arms obstacle planning. For these reasons the ability to further deny enemy mobility at their point of greatest vulnerability through the extension of engineer effects underwater represents an opportunity for CED that is largely overlooked.

In addition to their disproportional effect, underwater obstacles have the added characteristic of being particularly difficult to detect. In an age of exponential growth in ISR platforms and the correlated ability to conduct detailed remote reconnaissance from behind a desk through the deployment of Unmanned Arial Systems (UAS) etc, the ability to emplace obstacles without detection is increasingly difficult. CED has the ability to emplace obstacles undetected and also enable those sub-surface obstacles to remain concealed from UAS for the duration of the operation, with the only method of detection being the deployment of a similar dive element from the adversary or through the achievement of its intended effect once the obstacle has denied enemy mobility.

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3 COMMHPFOR, 'AUSCDT Defence Element Statement of Operating Intent', RAN, 2017

4 Brian Hartigan, '2RAR add helocasting to their skill sets', Contact Air Land and Sea, accessed on 08 Sep 18, http://www.contactairlandandsea.com/2018/07/08/2rar-add-helocasting-to-their-skillsets/

5 Canadian National Defence, 'B-GL-361-007/FP-001 Combat Diving', Engineer Field Manual, 2002, pp. 55-61

6 Australian Army, 'LWP-CA (ENGR) 2-1-2, River Crossing, 2011', Land Warfare Procedures - Combat Arms (Engineers), P. 1-1

A notable capability grey area in joint war fighting is also recognised in the denial of Sea Points of Entry (SPOE). The Navy's Clearance Divers have clear utility in the clearance and preparation of SPOE for landing forces however when there is a requirement to deny these coastal locations it is the responsibility of the Army's engineers to provide the countermobility effects. Countermobility effects along large coastal frontages would be inefficiently achieved through CED and would most likely be implemented by CER plant assets on a larger scale. However, for locations with few naturally suitable landing site locations, or for naturally restricted littoral avenues of approach, CED provides commanders the ability to carefully select and implement discrete and efficient countermobility effects.

Finally, the use of underwater demolitions can be utilised by CED as an expedient and efficient method of achieving countermobility effects. Canadian Combat Diver doctrine references that 'combat divers can carry or tow approximately twenty kilograms of explosives and accessories while swimming'[7], however the net explosive quantity carried per CED throughout training in Australia rarely exceeds approximately one to two kilograms due to range restrictions. Implementing countermobility effects through demolitions is the most tactically sound method for CED in the context of combined arms support as it requires few tools and equipment and can be prepared in advance in order to minimise time on target and therefore reduce risk to personnel.

Mobility and countermobility support are the two most commonly executed functions by CE Squadrons in the combined arms environment and therefore require the greatest level of scrutiny and development in the context of the CED capability. It is important to recognise the CED capability as an extension of current engineer land effects already being achieved on surface to the underwater environment. These two functions will remain the focus of CED tactical application however it is important to recognise the support CED can offer the CBT Bde across the spectrum of warfare, particularly survivability support, sustainability support and Army emergency response.

Survivability Support, Sustainability Support and Army Emergency Response

CED in its current state is postured to provide these functions in support of the CBT Bde and require minimal modification to current standard operating procedures to ensure its applicability to tactical situations. Generally, the functions of survivability support, sustainability support and Army emergency response are not conducted in environments where the threat of enemy contact is high, and if so, are conducted with an increased security presence noting the inherent vulnerability of tasks to achieve these effects, regardless if carried out on land or underwater. Examples include search and recovery of friendly equipment, search for explosive ordnance or contraband in underwater structures, maintenance and repair of underwater structures or personnel search and rescue/recovery. It is important for CED to maintain these skills and ensure that any restructuring or significant decisions to increase tactical employability do not negatively inhibit those functions.

Modernisation

The CED capability is currently undergoing a modernisation process that will further enable commanders in the employment of CED. The areas undergoing greatest modernisation include diving equipment, CED policy framework and a subsequent concept of employment (CONEMP). The current equipment used by CED has restricted utility in non-permissive/semi-permissive operating environments due to its manoeuvrability and endurance at depth. However, with alternative in-service diving systems being made available to CED, it will have the ability to be integrated into an increased number of mission profiles and therefore enhance its breadth of application. Current CED policy relies heavily on the Australian Book of Reference (ABR)155 which is RAN controlled. A review of CED's over aching policy framework will consider more specifically the requirements of CED in support of the CBT Bde and will provide an appropriate safety architecture applicable to the employment of CED within contested environments. Finally, a coherent CONEMP will solidify the context surrounding CED employment and enable tactical commanders to realise their combat multiplying effect through their integration in combined arms training.

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7 Canadian National Defence, 'B-GL-361-007/FP-001 Combat Diving', Engineer Field Manual, 2002, pp. 26

Combined Arms Training

River crossing operations are most often tackled during final stages of All Corps Officer Training Courses (ACOTC) due to their requirement for combined arms synchronisation and heavy requirement for detailed planning. The reality of exercising these operations during a field training exercise is universally restricted by a number of constraints which thwart the opportunity for capabilities such as CED to realise their full potential.

Furthermore, although a number of capabilities are available to provide the Army freedom of movement regardless of terrain, the realities of the increased time and resources required to cross significant obstacles are vastly overwhelmed by the time pressures on most large training exercises. This creates the tendency for manoeuvre elements to 'box around' them and find alternate routes to enable the 'tempo' of the exercise to be maintained. This is certainly not unique to CED but applies to the majority of CE effects. Exercise design will emplace notional obstacles, removing the ability to target certain mobility corridors, because to do so would disrupt the opposing force so effectively that desired training outcomes are not be able to be achieved. This limits the opportunity for capabilities such as CED to effectively integrate into the combined arms environment and subsequently the achievement of the mission. This therefore relegates training to corps specific exercises focusing on individual or small team skills.

Given the emphasis on the littoral environment and the recognition of the need to increase Australia's amphibious warfighting capability in the 2016 Defence White Paper8, CED must maintain not only their technical skill, but be more effectively integrated in the way forward to realise its significant combat multiplying effect.

In response to recommendations put forward in Lieutenant Walsh's 2017 paper, the Army Work Diving Concentration 2018 promises to develop key tasks most likely to be required in support of manoeuvre elements and enhance their tactical integration. This exercise will also provide an opportunity for all CER's to share lessons learnt and develop tactics, techniques and procedures best suited to enabling the CBT Bde across the full spectrum of tasks.

Conclusion

Army diving have a proud and distinguished history in providing significant contributions to operations however must ensure it evolves with competing training pressures as well as the requirements demanded of the current and future operating environment. Whilst it is necessary for CED to maintain its individual and small team skills through corps specific training, it is of vital importance that CED are integrated into combined arms exercises in order to realise its combat multiplying effect in support of the CBT Bde.

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8 Australian Government, Defence White Paper 2016, Department of Defence, Canberra, para 2.6, p. 41

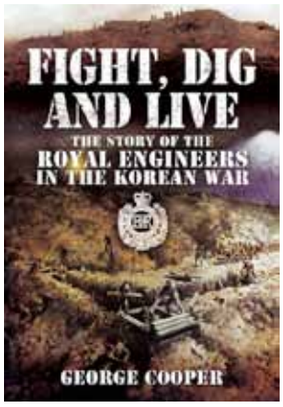
Book review

MAJ RJ Orr

Fight, Dig and Live: The Story of the Royal Engineers in the Korean War

Author: George Cooper[1]

Pen and Sword Military
2016, ISBN: 978-1-47388-663-6



"These members of the Corps of Royal Engineers … were involved in what was probably the most difficult, exhausting and demanding conditions Sappers have ever had to contend with and overcome." [2]

Just over a year after the 1988 dedication of the Royal Engineers Korean War Memorial, which was unveiled by the author of this book in his capacity as the Chief Royal Engineer, I sat opposite him at a Formal Dining-In Dinner. It was a daunting position for a naive, newly commissioned Royal Engineer. The General's record was considerable and well known, and he was literally living history, appearing as he did in the forefront of the Terence Cuneo painting "The Hook" – next to a Black Watch officer and used on the cover of this book – which still hangs in the Corps of Royal Engineers Officers Mess, Chatham today. I should not have worried; the General was charming, engaging, working hard to put us all at ease and was genuinely interested in us as future officers of his Corps. Just occasionally, though, his grit and steel showed through; by the end of the evening it was clear how and why he had achieved what he had.

In his Forward, General Sir Peter Wall KCB CBE (a UK Chief of the General Staff and Chief Royal Engineer) states that, in the Korean War (1950 – 1953) the achievements of the Sappers of the Commonwealth Division "… materially affected the course of the war to a considerable extent and made possible many operations which otherwise could never have been undertaken." Having worked with General Hall when he was a Brigade Commander, I know he is not one to exaggerate, and having read this book, I have no doubt that he is correct. As becomes apparent throughout the book, the extremes of climate and terrain, the underdeveloped nature of Korea and the ferocity and scale of North Korean and Chinese assaults supported by some of the most expansive artillery barrages ever fired made the role of the Sapper more challenging that most conflicts before or since. Rivers would freeze with over half a meter of ice in winter, and then become raging torrents in summer; or rise from a fordable 1m to a depth of 12m in less than a day (with 3m of that rise in 15 minutes), destroying even the most substantial steel bridges and cutting off formations before they could react. Minefields would be laid and re-laid more times than could be properly recorded despite best intentions, with the winter cold so great that arming (or indeed disarming) mines over more than a few minutes was impossible as gloveless fingers (necessary in this role) would freeze. Battalion trenches, tunnels, firing pits, wire obstacles and other defensive structures would take literally hundreds of sappers, supported by even more South Korean labourers days to complete, often under fire or only achievable under cover of darkness, only to be destroyed in a matter of hours by Chinese barrages and assaults and then rebuilt again (and again) lest the defensive positions be over-run.

Starting with a Field Squadron (of probably double the size of a RAE sub-unit), rising to an Engineer Group of a Regiment with 3 x Field Squadrons (again at least double in size of a RAE Sub-unit) and a Park Squadron supported by over 1,000 Korean Service Corps personnel, the immensity

1 General Sir George Leslie Conroy Cooper GCB MC DL.

2 The Reverend SJ Davies MBE QHC, padre of The Gloucestershire Regiment, Battle of the River Imjin (April 1951) at the dedication of the Royal Engineers Korean War Memorial, Chatham, Kent, UK, 24 April 1988.

of the engineer effort is vividly portrayed as the book progresses. The speed and scale of the initial withdrawal by the UN forces, followed by the advance to the Korean / Chinese border, and then the withdrawal back to positions along the Imjin River and a change from a very mobile campaign to a much more static one is imprinted on the reader early on. To top it all, it was done with a mixture of regular (some with considerable experience from the recent WW2) and many National Service conscripts with little to no experience.

All the anticipated engineer tasks abound in their variety, magnitude and repetition. In an era where mechanical methods of military engineering were limited, and where the terrain and tactical situation often dictated few of no mechanical engineering techniques could be used, the effort (and exhaustion) of the Sappers is a strong theme throughout the book, especially when repairing or rebuilding again and again what had been damaged or destroyed by nature or the enemy.

Constructing and maintaining bridges and wet gap crossings, route construction and maintenance (with associated camouflage, concealment and deception), quarrying, mine warfare, construction and repairs of defensive positions on steep, exposed hill-top features such as "The Hook", and what I suspect was one of the biggest series of reserve demolitions ever undertaken by the British Army (including the River Han "Shoofly" bridge of 66 spans and 300m-plus wet gap, all charges below the waterline and no military divers) – the Sappers' work was always in demand and never done. As I read the book (and think back to my battlefield studies on the ground of the battles of Kapyong, of the First Battle of Maryang-san, and of the battle of the Imjin River and Gloucester Hill), I was left to wonder how the Corps of RAE would cope in similar circumstances today. I am sure that we have the equipment, personnel and training but as to how long we could sustain the tempo, scale and physical effort on Sapper and equipment… The Annex in the book, listing one month's worth of military engineering tasks for a Squadron, is illuminating.

The importance of training, basic military and good infantry skills is evident and subtly illustrated and stressed. A Battle School was established in Japan where deploying units and individuals transited, manned by battle-experienced staff on their way home. It is clear that, at least for the Sappers, this was invaluable. The value of good infantry skills, and trust from the infantry themselves when Sappers accompanied them on patrols and raids is essential, as evident during the "Rip, Van Winkle" raid as just one example.

Throughout the book, the human element is overlaid. Indeed the author states in his introduction that, noting that there are numerous books that cover the historical side, he has "… concentrated on the more human aspects with just sufficient history to provide background and continuity." The book is well illustrated with diary entries, poems, songs, images, humour, honesty and poignant memories that bring this "Forgotten War" (as it has been described in the annals of British history) to life. This for me this is the real strength of the book; it is perhaps one of the more defining descriptions of who and what Sappers are, and why we are such a defining but often unsung capability in any military force. From the mobilization by Commander Royal Engineers of the Division's entire transport fleet to collect timber from a US resources dump to Sapper JNCO literally leading infantry assault parties in the final attack, the book also exposes the responsibilities and associated initiative requirements, leadership demands and personal bravery placed on commanders and Sappers at all levels, but especially at sub-unit and below. There is much for us all to ponder and learn from.

I don't have my own published book list of recommended reading; if I did this would be towards the top of the entire list and certainly at the top of the section relating to military engineering. The book is an easy but valued read, with a valuable mix between professional sapper activities, participation, courage, hard work and determination, together with anecdotes of reality and humour during a vicious war, and does include mention of RAE and NZL individual Sappers. It took me over 8 months to persuade the Russell Precinct Defence Library to buy a copy of this book; it is testament to the significance of the subject matter and the skill, authority and humility of the author that the book has been on continuous loan since its arrival, and has a healthy waiting list of potential new readers. Clearly the exploits of – albeit British – military engineers in a war from over 65 years ago still have a lot to offer and educate Royal Australian Engineers of all ranks and positions now.

Sapper Obituaries

'Lest we forget'

John Farrow
Passed away on 12 September 2017 aged 77 years. He joined the Army as an 11th Intake Army Apprentice Architectural Draughtman in 1956. He served in Wewak PNG with 24 Const Sqn.

Peter Attwell-Brown
Passed away on 25 September 2017 aged 79 years. Peter was called up for National Service in January 1957 and joined 13 Fd Sqn in April. After completing his 6 years obligatory service Peter left the Army as a Cpl and began a career as a Marine Electrical Engineer on the MV Cape Don supplying lighthouses from Esperance to our NW and as far as Groote Elyandt, in the Gulf of Carpentaria.

James Kimberley
Passed away on 27 September 2017. James joined the Australian Regular Army Special Reserve in Jan 1961 and after recruit and Corps training was posted to 1 Fd Sqn. He served in BCFESR, 22 Const Sqn, 17 Const Sqn, SME and LWC. James reached the rank of WO1.

John Dillon
Passed away on 12 October 2017 aged 81 years and 5 months. He joined the Army as a 7th Intake Army Apprentice C&J in 1952. He was a member of 22 Const Sqn from 1955 - 1962. John joined the Department of Works in 1962 as a building supervisor and remained with them until he retired.

Kevin Myers
Passed away on 13 November 2017 aged 84 years and 6 months. He was called up for National Service and joined 44 Rlwy Sqn. When the Unit closed he joined 13 Fd Sqn and was promoted Lt soon after joining. In 1962, with the expansion of 22 Const Sqn, Kevin was the Tp Comdr of the CMF Tp that became 3Tp, 22 Const Sqn. Kevin was a member of the Association.

Ken Barker
Passed away on 22 November 2017 aged 82 years and 10 months. Ken served in Vietnam from January to December 1970 as Sgt with 1 Fd Sqn and 17 Const Sqn.

MAJ Rob Vickery
Passed away on 24 November 2017. Bob served in numerous units including 13 Fd Sqn, 17 & 20 NSTB, Officer Cadet School, ASTF, SME, TTC, 1 LSM Delivery Sqn, FELF, HQ 1 Port Command, 821 Water Tp Gp, 4 Water Tp Gp, 10 Mov Control Gp, 11 Mov Control Gp Australian Force Vietnam Detachment, ASC, AHQ, HQAFV, HQ 2 Supply Gp and HQ 2 Mil District

Matthew Carroll
Passed away on 30 November 2017 aged 73 years and 6 months. Matt served in Vietnam from June 1966 to May 1967 with 581 Sig Tp and from December 1968 to October 1969 with 1 Fd Sqn. He was also a member of 22 Const Sqn in 1970/71.

Robert Henry Tough
Passed away on 26 December 2017. Bob was the SSM 1 Fd Sqn in Vietnam at one time.

COL Peter Daniel
Passed away on 26 December 2017. Peter was the inaugural President of the Sapper Association, NSW when it was formed as the Army Reserve Field Engineers Association (NSW).

John Hamalainen
Passed away on 01 January 2018. John served with 24 Const Sqn and 2 FER from 1970 to 1976.

LT John Harris
Passed away 01 January 2018. John joined the army on 3 June 1940 and in the short term joined the RAE as a Sapper (Fd). He served with 2/3 Fd Corps, transferred to 23 Fd Coy and then to 2/23 Fd Park Coy. He was commissioned in the Middle East whilst on active duty. He later served in the Islands and was promoted to acting CAPT.

Kevin Patterson
Passed away on 26 January 2018. Kevin served with 55AESS/EWPS.

LTCOL Gerard Sharkey
Passed away on 12 January 2018. Some of the RAE Squadrons that Gerry served in were 104, 107 (where he was OC), 203 and 22 Regiment – LTCOL Sharkey's contributed over 30 years to his military career most of which was with the Corps

John Holman
Passed away in February 2018. John served with 21 Const Sqn amongst other units and did a tour of PNG.

COL Rex Rowe, OBE, MID
Passed away on 05 February 2018. Rex was the OC 1 Fd Sqn, South Vietnam from 1969 to 1970 during a time of heavy casualties from mines and it was during his command that clearing of the notorious barrier minefield began.

Alan "Shakey" Cameron
Passed away on 06 February 2018. Alan served with 38 Fd Sqn (7FER) which was located in Latrobe Valley. Alan was a big man in stature but is also remembered for his booming and unique voice which could be heard all over the depot. Alan completed in excess of 30 years' service to Defence.

Lindsay Ernest "Nipper" Simpson
Passed away on 22 February 2018. Nipper did three tours of Vietnam with 17 Const Sqn 1966 – 1977, 1 Fd Sqn 1968 – 1969 and 17 Const Sqn 1970 – 1971.

SGT John Pendergast
Passed away on 13 Mar 2018. John joined the CMF on 02 Jun 1959 and discharged from the ARA on 09 May 1984. He served with 45 Inf Bn, 30 Inf Bn, 2 Bn RNSWR, 3 Bn RNSWR, 1 RTB, 17 Const Sqn, 1 Fd Sqn, 23 Const Sqn, attended LTS, ECPD, 1 ACAU, SME, 2 Trg Gp and 4 Fd Engr Regt. John conducted two tours in South Vietnam plus a "visit".

Peter Gammon
Passed away on 23 March 2018. Peter served with 1st Fd Sqn 1in South Vietnam 966 – 1967, 7 Fd Sqn, 18 Fd Sqn and 17 Const Sqn.

Neville "Nipper" Marwood
Passed away on 25 March 2018 –. Nipper served in 107 Const Sqn, 22 Const Regt and 105 Const Sqn.

Peter Marotta
Passed away on 02 April 2018

Henry Francis Wright
Passed away on 03 May 2018

LTCOL John Henry Alan "Paddy" Martin
Passed away on 03 May 2018

Robert "Bob" Silk
Passed away in May 2018. Bob served in Vietnam from May 1967 to April 1968 with 1 Fd Sqn.

WO1 William Milence Scorse MID
Passed away on 07 May 2018

Graham John Daunt
Passed away on 09 May 2018

Rodney Andrew Percival Armstrong
Passed away on 14 May 2018. Rod served in 17 Construction in South Vietnam

Warren Edwards
Passed away on 17 May 2018. Warren served with 17 Const Sqn, 1st Australian Land Clearing Team in South Vietnam in 1968. He was wounded in action in August 1968 but recovered and continued serving.

Graham "Stewie" Stewart
Passed away in mid-May 2018. Stewie served with 34 Water Tpt Sqn at Kangaroo Point Depot.

Richard "Dick" Fairhurst
Passed away on 20 May 2018. Dick served with 34 Water Tp Sqn at Kangeroo Point Depot.

Kevin Pippard
Passed away on 24 May 2018

Fredrick Alexander Whitchurch
Passed away on 06 June 2018. Fred served with 2/9 Fd Engr Coy, 7th Div, AIF. He took part in the landings at Balikpapen Borneo during WWII

Athol Leslie Busk
Passed away on 25 June 2018

Graham Ridell
Passed away in July 2018. Graham served as the SQMS at 42 Rly Sqn, RAE, TN (SR) until it was disbanded in 1968.

Max "Doc" Liverstone
Passed away on 08 July 2018. Doc was a Vietnam Vet (3 Fd Tp) and very active in Victoria for the RAE Victorian Vietnam Vets Associations.

Koostantinoes William "Bill" Unmeopa
Passed away on 11 July 2018. Bill was a Vietnam Veteran and a Tunnel Rat who served in South Vietnam 1965 – 1966 with 3 Troop (1st Field Sqn) and completed his service at the RSM SME in 1987.

Brian John Smithson
Passed away on 23 July 2018. Brian served in South Vietnam with 55 AES from 1966 – 1967

Allan "Blue" Rantall
Passed away on 29 July 2018 -. Allan served from 1966 – 1991 reaching the rank of CPL. Allan was a great sapper and a very proud Vietnam Veteran. He was a Tunnel Rat and served the RAE with devotion and distinction both here and abroad. He was recently awarded the Unit Citation for Gallantry for his actions at FSB Coral & Balmoral.

Peter Carrodus
Passed away on 05 August 2018.

MAJ Brian Chirgwin, RFD, ED
Passed away on 16 August 2018. Brian reached the rank of Major and was a member of 22nd Construction Regiment

SSGT Henry "Harry" George New, MID
Passed away on 10 September 2018. Harry enlisted on 06th October 1939 and discharged 23rd October 1945. He served for the entire duration of the Second World War. He was a member 2/2nd Field Company (6 DIV) and saw action in most of the main theatres of conflict of the war Egypt, Syria, Cyrenaica, Greece, Syria/Turkey border control, Darwin and PNG obtaining the rank of SSGT. His last operation was Aitapi to Wewak campaign during which he was awarded a MID.

WO2 Thomas Campbell "Henry" Young
Passed away 16 September 2018. Henry entered National Service in 1959 and discharged in 2002. He served with 7 Fd Sqn, 11 Indp Fd Sqn and AATTV, 24 Fd Sqn, 11 Fd Sqn and 1 Trg Gp ARes.

Ronald George Hoffman
Passed away on 19 Sep 2018. Ron served during WW2 and served in 24 Fd Coy RAE, AIF from 1943 to 1945

Alan "Kiwi" Ngati
Passed away 05 October 2018. Kiwi served as a Sapper in the New Zealand Army and then the Australian Army serving with 22 Const Regt.

WO2 Thomas "Neville" Trevena
Passed away on 05 October 2018

Colin George Wright
Passed away on 18 October 2018

Alan "Ali" Barbour
Passed away on 20 October 2018

Stuart "Kiwi" Fraser
Passed away on 30 October 2018

Gerald Andrew Lyall
Passed away on 02 November 2018

John Joe Skubis
Passed away on 27 Nov 2018

Barry John Green
Passed away on 29 Nov 2018

Personnel matters

Awards

MEMBER (AM) in the Military Division of the Order of Australia
Brigadier Simon Paul Welsh

Conspicuous Service Cross (CSC)
Colonel Leonard Rouwhorst
Lieutenant Colonel Henry Stimson

RAE Prize Winners - RMC
November 2017 - LT Jordan Ellem
July 2018 – LT Josh Paynter

RAE Excellence in Military Engineering Award
The ARA excellence award (SPR)
SPR R Roach (3 CER)

The ARA excellence award (NCO)
CPL T Mondzheyovsky (3 CER)

The ARes excellence award (SPR)
SPR L Mason (11 ER)

The ARes excellence award (NCO)
CPL B Malic (3 Fd Sqn)

Promotions

DOCM - A (No details provided)
DSCM - A (No details provided)

MUSEUM *of* MILITARY ENGINEERING

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

Amphibious Beach Team on Sea

CPL Michael Harraway

A dozer pushes off a navy LLC that has become stuck after loading a MAN truck, during Ex Wader.

There is a lesser known engineer element attached to 10FSB based out of Ross Island barracks in Townsville. These Engineers are part of the Amphibious Beach Team (ABT) that supports the Navy with amphibious operations, usually attached to one of the Amphibious Assault Ships, otherwise known as a Landing Helicopter Dock (LHD).

One ABT generally has two engineers attached, one Plant Operator to operate the JD850J Dozer and one Plant Foreman to supervise plant and MHE operations. Currently 10FSB run two fully manned ABTs. The primary role for the two engineers is recovery of any immobilised vehicles across the wet gap or beach setting with the aid of a dozer. Secondary tasks include control and supervision of loading/unloading landing craft, track clearance, obstacle removal and beach refurbishment.

This year saw the ABT deploy to Kings Beach in Bowen for the first part of the Sea Series Exercise which concentrated on training all participants in amphibious operations. Day one of the beach landing saw myself and SPR Quigley kept busy with the recovery of both G-Wagons and Unimogs. With the aid of a new 80T synthetic recovery strop, purchased by 10FSB just for this exercise, all recoveries were relatively straight forward.

During the training at Kings beach the LX120 loader blew a hydraulic hose right on the low tide water mark, making recovery all the more urgent. The two engineers quickly took charge and coordinated a recovery plan. The recovery mechanic attached to ABT stopped the hydraulic leak, the dozer was attached via the 80T recovery strop and the loader was dragged, with all wheels locked, further up the

beach away from the incoming tide. From here the brakes were disengaged on the loader and then recovered up to a hard standing where it could be safely repaired. With all the contaminated sand being bagged into contaminated waist bags and backloaded to Townsville for disposal, the recovery was a good test of recovery procedures.

A unique part of working on the beach is having to backfill holes at low tide that were created by the landing craft. Working with plant equipment in the ocean isn't ideal and is very demanding on the equipment. To our surprise, SPR Quigley was able to refurbish the beach to a fairly good standard, it was strange to see a dozer pushing mounds of sand through the ocean, not typically where you find dozers operating.

After the training element of the Sea Series exercise was complete the HMAS Canberra and HMAS Choules loaded all the amphibious elements and sailed to the Shoalwater Bay Training Area (SWBTA) for the amphibious beach assault as part of Hamel 2018. We all spent a few days on the ship preparing equipment and ourselves for the beach landing, truly a unique environment for any plant operator.

The night time beach assault went as smoothly as expected and over the next three days, the engineer element of ABT assisted in beach recovery and beach refurbishment. A highlight of the exercise was helping with the introduction of the LAND121 vehicle fleet. The MAN 40M truck and trailer unit was recovered easily with the dozer and 80T recovery strop and a lot of valuable training experience was gained through this exercise.

Plant operators from 2 CER that were part of HMAS Choules helped out the ABT with unloading of stores with their LX120 loader. It was good to see how well engineers work together, even across different units the comradery is strong.

After the ship was unloaded of all deployable equipment, ABT was backloaded onto the HMAS Canberra and sailed back to their home port of Townsville. Next year the exercise will possibly be held in Tasmania which will add a cold element to training.

A Dozer recovers an LX120 after becoming stranded after incurring a mechanical fault.

Raymond Charles 'Mick' Mace MM, BEM Unveiling of the Mace Oval Plaque

Mr Jim Davis

WO2 'Mick' Mace MM, BEM was awarded his MM during the breaching of beach obstacles during the pre-assault phase of the landing on Tarakan Island, 30 April - 31 May 1945.

His citation reads:

"For courage, personal endurance and leadership in the breaching of beach obstacles during the pre-assault phase of the landing on Tarakan Island, 30 April-31 May 1945.

LCpl Mace was the NCO in command of a demolition team engaged in the breaching of underwater beach obstacles on Lingkas Beach, Tarakan Island on 30 April (P – 1 day).

LCpl Maces's section was transported to the position for the gap by LVT and, although the vehicle came under LMG fire on touching down, LCpl Mace IMMEDIATELY led his team into the water to attack the obstacles.

Despite the intermittent fire of the enemy LMG and sporadic mortar fire falling around the working party, LCpl Mace by his coolness and outstanding example to his men kept the work going without pause, and blew, completed and signposted his gap in thirty-five minutes.

He withdrew his party by LVT and went to the assistance of an LCVP party on Yellow Beach, who were unable to reach their objective owing to the depth of the mud. He attempted to carry a line to secure to one of obstacles to enable the section to drag themselves to the proposed gap but sank to the shoulders in the mud, and had to be dragged back through twenty-five yards of heavy mud. The LVT again came under mortar fire but LCpl Mace took the vehicle to the oil pier, and under sniper fire led his team to the beach and attacked the obstacle from the shore side with complete success. By lying flat in the mud and dragging himself along he succeeded in reaching a line thrown from the LVT and evacuated his team by this means.

His personal endurance, courage and leadership were wholly responsible for the effective completion of the two gaps."

After Mick's return from Tarakan, he went straight into RAEME as a corporal, posted to Balcombe where the Army Apprentice School (AAS) was emerging. He was soon an infantry sergeant, his third Corps affinity, and living nearby with his growing family. The year 1954 saw him awarded the BEM on 11 December 1952 for selfless duty overseeing the construction of the AAS oval and other sporting facilities, besides exemplary leadership as an overseer and mentor of the young apprentices. His citation reads:

"By his outstanding devotion to duty and by inspiring leadership Sergeant Mace has made a significant and important contribution to the setting up of the Army Apprentices' School at Balcombe, Victoria. For more than a year he worked efficiently and arduously almost every day from dawn until after dark on earth-moving equipment to prepare the school oval, declining to take leave at week-ends, or during the Christmas and Easter breaks. Since the school opened he has had the responsibility for the domestic life and behavior of many of the apprentices whose high regard he has won by his strict but fair enforcement of discipline and his tolerant und

Left page: Mick Mace standing at the centre of the rear rank, with his section.

This page (left): Photo of the plaque at Mace Oval

This page (bottom): Councillor Hearn, assisted by Mick's three daughters – Helen, Lorraine and Ann, unveil the Mace Oval plaque.

understanding approach to their problems. At the beginning of 1951 he voluntarily gave up 14 days of his current year's leave to enable him to undertake the training of the new intake from the day of their arrival at the school. No member of the staff of the school has given such self-sacrificing devotion to its welfare as Sergeant Mace has done."

To honour Mick for his outstanding efforts in the construction of an oval at the Balcombe Apprentice school, the Australian Army Apprentices Association (AAAA) arranged to have a bronze plaque dedicated to recognise Mick.

The dedication took place on the 15 June 2018, in front of a crowd at the oval. The guests included, Representing the HOC RAE (BRIG Wainwright) was LTCOL Sharon Coates Commanding Officer 22nd Engineer Regiment and RSM WO1 Justin Jones, 15 old apprentices (including our own Bill van Ree, Don Hughes and Noel Tipton) along with a number of members of the RAE Association, the Balcombe Grammar, Mornington Council and members of the Mace Family.

The Balcombe Grammar School which is located next to Mace Oval, and who make good use of it, were of great assistance in helping this plaque come to fruition. In addition to the Principal and other executive of the school the year 12 Captains (Amy Skene and Darcy Wrench) were there and were asked to give an impromptu talk on the significance of the Mick Mace Oval to the school which they both handled very well. They displayed a good knowledge of the historical aspects of the oval and the value it plays in their sporting activities.

Finally the plaque was unveiled by Councillor Hearn who was assisted by Mick's three daughters – Helen, Lorraine and Ann – there was plenty of Mick's extended family also within the gathering.

There is no doubt that through the efforts of Balcombe Grammar School and the Mornington Shire Council this wonderful piece of history will go on for many years with the future generations talking about the sporting achievements gained on the oval rather than the parades held there.

The RAE Collection and Museum

MAJ Craig Clunas

The team at the museum has continued to evolve during 2018. Many of you will know Mr Sebastian Spencer, the museum's long serving curator. He began working with us in 2011 and decided this year, it was time for change. We are extremely appreciative of Sebastian's hard work over the years and the care he has taken of the Corps collection. He has moved to RAAF Heritage where he is sure to make a lasting impression, as he has done here. We are currently recruiting a curator and hope to be able to announce who is taking on this role in December 2018.

Much of the year has been spent consolidating the collection. Whilst we have a wonderful display, much of the work completed by the staff and volunteers is behind the scenes; registering objects (document, photograph or artefact), researching an object's provenance and preparing objects for storage or display. As an example of the work being completed, our database is nearing 20,000 registered documents, books and photographs. Many of the photographs have now been scanned and we hope to begin to make this available to museum visitors in 2019.

In July the museum was pleased to combine forces with Soldier On and support their Serving On program. The group, predominantly RAN and ex-RAN personnel, constructed a single panel bailey bridge to be incorporated with the main display.

The museum continues to work with units and associations. This year the curator and manager visited the Royal Australian Engineers Association of Victoria to review and advise on their collection, its development and management. Collections such as this serve a purpose in capturing the contribution of the Corps in the various States, the development of its infrastructure, rural areas and its people. The team involved in maintaining and developing this collection are doing a great job. One of the Association's projects, working with Local and State governments, identifying infrastructure across Victoria constructed by RAE units is a great initiative. An example of the plaques the Association has produced is below.

If anyone has objects, photographs or documents that they wish to donate to the Corps collection, 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	$25.00
RAE Corps History Vol 2	$25.00
RAE Corps History Vol 3	$25.00
RAE Corps History Vol 4	$50.00
RAE Corps History as a set	$100.00
RAE Corps History Slip Cover	$20.00

Clothing	Price
RAE Under Tshirt-Brown	$22.00
RAE Under Tshirt-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

Figurenes	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

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