July 13, 2022

Marine Corps Engineer School

Engineer Community Newsletter

In this issue:

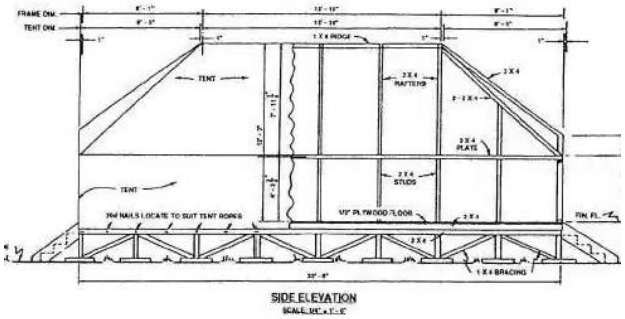
Big Changes coming to the Water Support Technician (1171) Training

Both the Basic Water Support Technician (BWST) and Advance Water Support Technician (AWST) Programs of Instruction (POIs) will be seeing big changes to the upcoming courses. For BWST, NCO level maintenance tasks have been added to the POI allowing 1171s entering the fleet to have a basic understanding of operations and maintenance of water support equipment. More field based training and culminating events will be added to ensure Marines utilize skills they've learned throughout the POI. For AWST, lessons on infrastructure assessment have been added. A distance learning prerequisite phase has added for the NCOs. These changes directly support Force Design concepts by providing highly trained 1171s to the Fleet.

Combat Engineer NCO POI Update

The Combat Engineer POI is under review and will have major changes for the first iteration in FY23. The number of course days have been greatly reduced to relieve the time away from commands. While shorter in length, there is more material being taught. The POI has added a distance learning component for NCOs to complete prior to arrival. The new POI will begin in Oct 2022 with the distance learning and resident portion begins in January 2023.

Drafting/Surveying Training Opportunity



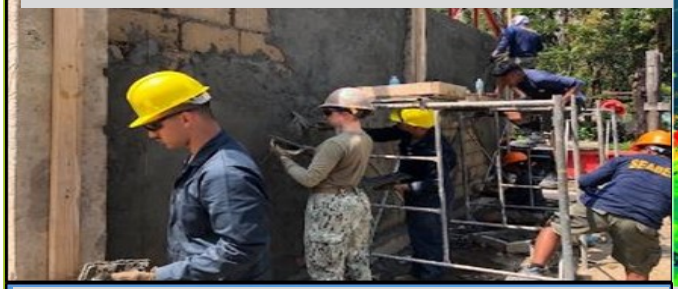
During FY23, MCES will experiment with MOS 1361 training to determine if core drafting and surveying competencies can be mastered and retained across multiple engineer and utilities disciplines. Beginning in October, 2022, we will execute three stand-alone Drafting and Design courses and three stand-alone Surveying course utilizing Second Term Alignment Program (STAP) Marines from the Fleet Marine Force (FMF) in the 11XX and 13XX occupational fields. These courses will include the tenets of 21st Century Learning and adult learning theory, while capitalizing on distributed learning. FMF participation will be unit funded. Upon graduation, Marines will be tracked and assessed to gauge skill proficiency, skill retention over time, and impact on primary MOS skills. Additionally, graduates will receive credit in their Electronic Training Jacket via "local School" completion.

Drafting and Design Course: ~15 training days covering sketching, AutoCAD fundamentals, mechanical, architectural and civil drafting, 3D printing, and design fundamentals. Open to all 11XX and 13XX MOSs.

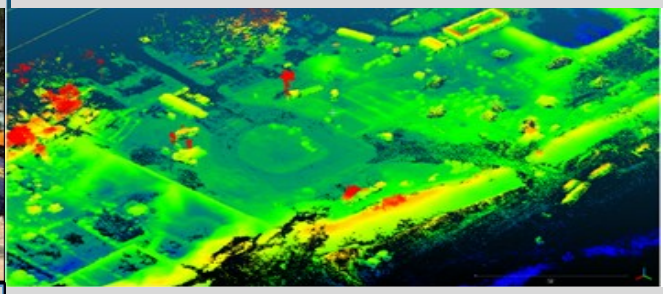
Basic Construction Surveying Course: ~30 training days covering theory and principles of surveying, equipment and software, data collection and processing, and civil design/export/stakeout. Target audience: Primary – 1371, 1345, 1391, 1171; all other 11XX/13XX MOSs based on availability/demand.

Experimentation course dates will be published via separate correspondence during August 2022. For additional information, contact MCES Ops Chief at (910) 440-7346 or MCES T&E Branch Head at (910) 440-7293.

Marines working ENCAP construction of a school in Clavaria, Philippines ICW NMCB-5

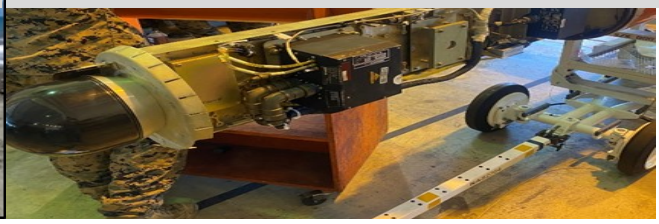


LiDAR image of Aparri Beach, Philippines



Mobility Operations ISO 1-1 ADA (Patriots) on Clavaria Beach. Engineers enabling offload of the

EOD Exploitation (Level 1 and 2) BQM-74E Drone. Marines from MCB Butler, CLB-31, and 9th ESB



Greetings from Okinawa! 9th ESB update

Submitted By: LtCol Marcus Gillett, Commander 9th ESB

Over the past year Marines of 9th ESB and III MEF have been focused on four lines of effort (LOE): Operational Access, Geospatial Intelligence, Mobility, and Survivability, which culminated during Balikitan-22. 9th ESB operated in the northern Philippines conducting mobility operations in the form of engineer support to amphibious operations (beach, route, and HLZ improvement), geospatial reconnaissance (route, bridge, and port assessments), and general engineering in the form of vertical construction.

1. Operational Access (Competition): This is the concept that engineer operations, via horizontal and vertical construction, facilitate MEF, NEF, and Joint Force access to key maritime terrain. Currently 9th ESB is conducting 4-month rotations of Marines in Palawan (Philippines) with Naval Mobile Construction Battalion. In Sept 2022, the battalion will be conducting site assessments in order to inform the development of a Prioritized Engineer Project List (PEPL) internal to III MEF and MARFORPAC with the intent of resourcing projects that will take place long term (outside of the exercise cycle).
2. Geospatial intelligence (Competition): In the past 12 months the concept of the Littoral Engineer Reconnaissance Team (LERT) has developed substantially and has become a high demand, low density asset within III MEF. Future actions are to continue to expand the role of the LERT and the team has operations slated for areas throughout AO including Taiwan, Johnston Atoll, Central Luzon, and Batanas Islands.
3. Mobility (Conflict): III MEF views mobility through the conduct of full spectrum engineering operations, which means that Marines must be capable of conducting Airfield Damage Repair and road repair, transition to deliberate breaching, and be capable of doing all engineer tasks between those two extremes. In a littoral environment we focus on the capability to detect to avoid from the very shallow waterline (VSW) to the beach and subsequent support to ensure the supported unit has assured mobility. Engineers will conduct detection of natural and man-made obstacles, beach improvement, port assessment and limited repair, route improvement, ADR, HLZ construction, firing point improvement, and other associated tasks. One key gap in our collective equipment is bridging and III MEF submitted both a D-UNS to address this gap and purchased a 5m Viper assault bridge in order to begin demonstrating future bridging requirements and capabilities.
4. Survivability (Conflict):): This consists of providing a unit with the ability to avoid or withstand the effects of enemy fires. In the future conflict the primary means to provide survivability, given enemy capabilities, is via assured mobility. That said, we are currently working with adjacent units in an attempt to identify requirements and develop tactics, techniques, and procedures to enable this requirement.

LERT and UCT Port Assessment – Screen shot of SRS fusion

What is LERT?

Littoral Engineer Reconnaissance Team

A team consisting of 1371s and Intel Marines equipped with Vapor-55s and LiDAR UAS, and ENFIREs able to augment adjacent reconnaissance elements. The LERT can focus on geographic areas that enable mobility. The LERT is capable of conducting: road, route, bridge, airfield, obstacle, tunnel, ford and ferry, and threat engineer reconnaissance in both competition and crisis.

Bulk Fuel Marines Fuel MV-22 aboard Ie-Shima EAF

Bulk Fuel Marines establish a FARP aboard Ie-Shima EAF ISO F-35B

UT PLT Operates Water Purification on Bellows Beach

Marines construct a rigid structure in Thailand during COBRA GOLD 2022.

HE operator offloads ordnance from a CH-53 in black out conditions ISO JWX 22.1.

Marines conduct airfield damage repair on the Futenma runway.

1st Marine Aviation Wing Engineers

Submitted By: Maj. Thomas H. O'Brien

1st MAW Engineers were exceptionally busy in the INDOPACOM region during the last quarter. Heavy emphasis on Airfield Damage and Repair training, and Forward Arming and Refueling Point operations in support of rotary wing and fixed wing aircraft. MAW engineers conducted exercise support, including: Cobra Gold, Balikatan, MRF-D. MWSSs also focused on building interoperability with allied partners, Joint forces, and other MSCs within the first and second island chains. AGSD has focused their efforts refining warplans, WTI-Support, building concepts of employment, and conducting site surveys in the SWI, KTO, and Mainland Japan.

MWSS 171: ADR training in Guam with joint forces and international partners. Water purification and heavy equipment operations within the FIC. FARP operations ISO F-35B, MV-22, and C-130 ADGR

MWSS 172: Engineers conducted reconnaissance, water purification, and renewable energy operations. Conducted Joint Warfare Exercise 22-1. Additionally, participated in a Cobra Gold ENCAP site in which engineers built a multi-purpose building for the Nong Bon Wittayakom School in Thailand.

MWSS 174: Primarily focused with achieving FOC by FY 23, with company and squadron level training in preparation for their MCCRE. Heavily involved in the creating AGS capability in the second island chain and building interoperability with joint forces.

THE CAPABILITIES DEVELOPMENT DIRECTORATE CORNER

Engineer Capability Integration Officer (CIO) News

LCED

Typical summer turnover is occurring within the Engineer Branch of LCED. CWO4 Hentzel (1390 CIO) has turned over with CWO4 McCabe, CWO4 McDonough (1120 CIO) turns over with CWO4 Gonzalez in July, and CWO3 Presley will be on deck in September to start turnover with CWO5 Polley (1310 CIO). All outgoing CIOs will PCA to LPE, I&L.

On the capability development front, the following are LCED updates for the community:
- A Capability Requirement Change (CRC) is underway to update the MTL, we are canvasing FMF and SE input via TMT. Also, coordination is underway between I MEF, PM Engr Systems (MCSC) and our branch to acquire (lease or buy) COTS wood-chipping equipment in support of I MEF tasks in the INDOPACOM AOR.
- The LWPS 3.0 CRC has been signed and provided to MCSC, which will provide additional QUADCONs to support LWPS 3.0 storage and embarkation. Additional small unit power and water requirements continue to move along as we continue to build out Small Unit Power (DC-power under 3kW) systems and components to enable small units in EABO.

If your unit has unique gear you're using in experimentation, don't hesitate to send feedback to your CIO. We have a number of items out there that were purchased with divestment credits (the MPEP and the AWG systems are prime examples) and your direct input on what worked and what did NOT work will help us write the requirements for new capabilities.

GCED-FP

The Combat Engineering and EOD Branch in GCED-FP is likewise entering a summer turnover. Major Massman is scheduled to check in during July to replace Major Brown as the Branch Head. Captain Theobald has checked in to replace Major Ellis as the EOD Capabilities Integration Officer. With the redesignation of billets in GCED Fires & Maneuver, all combat engineering capabilities development (mobility/countermobility/survivability) is now consolidated with Mike Thompson and Capt Rathwick who is currently serving 6 month IA to CENTCOM.
On the capability development front, the following are GCED-FP updates for the community:

- The Maritime Terrain Shaping and Area Denial Functional Concept has completed GO-Level review and is being routed to DC, CD&I for signature.

- The ENFIRE CRC has been signed to update the approved acquisition objective (AAO). The ENFIRE concept of employment is (1) per engineer squad at CEB, (1) per engineer platoon at the ESB, and (2) per MWSS. ENFIRE (Version 9.0) is currently fully funded in POM-23 – MCSC is working on the required acquisition documents for fielding in FY23.

- The Materiel Change Recommendation adopting the U. S. Army Capabilities Development Document for Common Robotic System (Individual) is currently being routed for Director, CDD signature. The CRS(I) concept of employment is (1) per engineer squad at CEB, (1) per engineer platoon at the ESB, and (2) per MWSS. The CRS (I) program is funded in POM-23 to the full AAO of 195 systems.

- The Engineer Tool Kit Modernization WG identified the need to update the Squad Demolition Kit with the same firing devices used by EOD. A draft CRC for this upgrade is being reviewed by MCSC – anticipate funding will be available to upgrade the Demo Kits during FY23-FY25.

CRASHED, DAMAGED OR DISABLED AIRCRAFT RECOVERY (CDDAR) TEAM CHIEF TRAINING

Written By; Warrant Officer Phillip Coutts, Marine Wing Support Squadron 372 'Diamondbacks'

From 19-26 May, Marines from MWSS-372 attended Joint, Crashed, Damaged or Disabled Aircraft Recovery (CDDAR) Team Chief training at Volk Field Air National Guard Base in Camp Douglas, Wisconsin. The seven-day course challenged students to think critically, plan, and prepare to recover aircraft in several different situations, with an emphasis on practical application, problem-solving, and teamwork. Attendees included Marines, Air National Guardsmenam Chief training at Volk Field Air National Guard Base in Camp Douglas, Wisconsin. The seven-day course , Airmen, and civilians. Scenarios included safely dealing with an F15 debris field to learn how to lead in composite recovery and investigation, A6 Intruder sling lifts, CH-53 recovery via Pneumatic Airbags, full and partial C-130 lifts, De-Bogging with airbags, and controlled rollovers with manually operated hoists. This course taught the students how to lead a safe and efficient salvage or recovery and was also an opportunity to work jointly, network, and share valuable experiences.

Marines trained on equipment such as TIRFORs (a mechanical hoist with an 8000lbs capacity) and a 26-ton pneumatic airbag system. The 26-ton pneumatic airbag system is not currently within the Marine Corps inventory, but almost every Army National Guard CDDAR Team possesses these items, along with sling kits and spreader bar kits, that can be assembled to fit most situations. CDDAR teams from other services often use contracted lift assets such as cranes and wreckers that do exist in Marine Corps inventory. Proper authorization from Commanders and establishing MOUs with other CDDAR units could provide additional pooled resources that would help save on equipment costs across the DOD and expedite Marine Corps salvage and recovery missions.

To inquire about training and registration for CDDAR Team Chief course contact CDDAR Program Manager via MCES Operations.

A Word From the OCCFIELD SPONSOR

- Engineer Summit aboard CPEN is currently planned for Sept 19-23, message will be released in July.

- Upcoming dates for the Joint Engineer Operations Course (JEOC).
  - FY22 Dates
    - 1-5 Aug: Wright-Patterson Air Force Base, OH.
    - 25-29 Aug: Joint Base Lewis-McChord, WA.
    - 12-16 Sep: Stuttgart, GE.
  - FY23 Dates
    - Class# Report Start End Location
    - 701 30Oct 31Oct 4Nov USMCU Quantico, VA.
    - 702 5Feb 6Feb 10Feb Joint Base Pearl Harbor-Hickam, HI.
    - 001 26Mar 27Mar 31Mar Fort Leonard Wood, MO.
    - 703 4Jun 5Jun 9Jun NBVC Port Hueneme, CA.
    - 704 30Jul 31Jul 4Aug Wright-Patterson Air Force Base, OH.
    - 705 10Sep 11Sep 15Sep Stuttgart, GE.

3D CONCRETE PRINTING: FABRICATION ON THE FORWARD EDGE

Submitted By: Master Sergeant Alfred Negron II

In June, technologists with the U.S. Army Engineer Research and Development Center, Construction Engineering Research Laboratory (ERDC-CERL) hosted the Automated Construction of Expeditionary Structures (ACES) Joint Capability Technology Demonstration (JCTD) aboard Naval Base Guam. The demonstration sought to exhibit the ability of military operators to construct concrete force protection barriers utilizing the ACES Lite 2 3D Concrete Printer and demonstrate the ruggedization of the 3D concrete printer. Participants, Seabees from the 30th Naval Construction Regiment, were provided with three days of training by ERDC-CERL subject matter experts and executed several days of concrete printing. The Seabees printed a Jersey barrier, 4' wall segments for laboratory testing, and an ECP guard post for blast testing. The ACES printer uses common commercial materials and additives (Type I/II Portland cement, sand, 3/8" coarse aggregate, superplasticizer, and bentonite). No proprietary materials or mixes were required during the JCTD. The concrete printer in its present configuration requires a minimum of seven personnel to unpack, build, and operate the equipment (not including personnel requirements for concrete mixing). The ACES printer is stored and transported in a 20' ISO container and includes a concrete pump, hoses, gantry system, and computer station for print operations. No concrete mixing equipment is included; the printer receives plastic concrete from available equipment. The maximum print area is approximately 20'x40'x10' and is scalable to accommodate smaller work sites. The ACES printer enables personnel to fabricate structures not possible with traditional construction methods and removes the need for formwork required by traditional cast-in-place methods. Costs associated with formwork, such as lumber, steel, fasteners, and lubrication, are eliminated by using concrete printing. Regardless of the construction method, concrete construction remains logistically intensive. Large quantities of heavy, raw materials consume resources to move and stage for construction, even if the materials are locally sourced. Other planning factors, such as cure times, rebar installation, and equipment washdowns, remain the same as with traditional construction methods. Concrete printing is not well-suited for all concrete projects, such as slabs, piers, or permanent habitable structures (unified facilities criteria have not been developed for concrete printing). Concrete printing primarily supports countermobility and survivability tasks. The concrete printer is a light, mobile manufacturing site capable of producing movable concrete structures. The capability could enable Naval Construction Forces to fabricate force protection barriers or obstacles closer to operational units during competition, reducing the logistical burden on friendly forces. Past experiments demonstrated the feasibility of concrete printing in support of mobility by fabricating a concrete bridge in Camp Pendleton. Although lab testing confirmed the bridge's capacity at around 45,000 lbs, real-world applications of concrete printing in this capacity is not likely. Further research is required to develop designs for non-standard bridges that meet tactical employment requirements, such as transportability of bridge components, launching methods, and anchoring. Concrete printing is a novel building technique that exhibits promise. Resource constraints associated with concrete construction remain; however, the flexibility provided by additive manufacturing opens new use cases for the future force.

ACES Lite 2 printing the lower section of the ECP guard post

Detail view of the printer nozzle in action. Extrudes a ~1" thick layer in a single line across the entire print.

UTILITIES MARINES IN ACTION

Submitted By: MGySgt Jacob Anderson

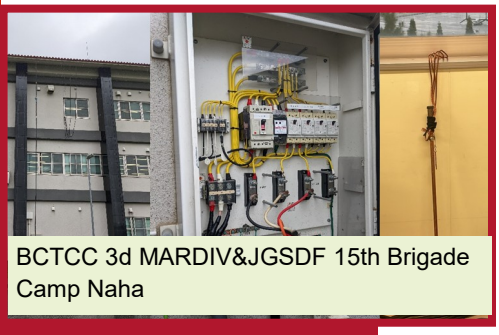
Utilities Marines across the FMF are participating in experimentation and testing in support of FD 2030.

MWSS 172 UTILITIES KAMANDAG 2021

8th ESB Winter Pioneer

MWSS 172 WATER RODEO 2021

CLB-22



BCTCC 3d MARDIV&JGSDF 15th Brigade Camp Naha

BUST Supervisor Survey

available at:

https://surveys.max.gov/553494?lang=en

UPCOMING MCES COURSES

- Advanced Engineer Equipment Electrical Support Technician (AEEEST): 19 July—22 Sep
- Advanced Electrician (AE): 1 Aug —29 Sep
- Advanced Water Support Technician (AWST): 29 July—29 Sep
- Utilities Chief (UC): 16 Aug—3 Nov
- Combat Engineer Platoon Sgt (CEPS): 11 July—12 Sep
- Small craft Mechanics Course (SCMC): 6 Jul—23 Aug
- Urban Breacher: 15—30 Aug
- **CENCO course dates TBD. ~Oct 2022 Distance Learning/Jan 2023 in-person**

MCES POCs:

Operations Officer

Operations Chief

Director of Instruction

Registrar/IMO

UPCOMING CCRBS

- CEPS/EOC 1st Qtr FY23

  Calling Message will be released in early August

- CEO 2nd Qtr FY23