Bridging the Canals

By First Lieutenant Waukemsha Kirkpatrick

The traffic pattern of civilian dump trucks delivering gravel to the Logistics Support Area (LSA) Anaconda's north entry control point (ECP) proved to be a constant problem. The trucks blocked the guards' field of vision and posed a serious threat of vehicle-borne improvised explosive devices (VBIEDs).

To solve this problem, the force protection team of LSA Anaconda's mayor cell and the 2d Battalion (Air Assault), 44th Air Defense Artillery, developed a plan to reorganize the gravel stockpile area and reroute dump trucks by upgrading two access roads and building bridges across two parallel canals south of the north ECP. The canal water, used by Iraqi farmers to irrigate their crops, would need to be blocked in order to complete the project.

The Project

The Horizontal Platoon and 2d Platoon of Bravo Company, 84th Engineer Battalion, were assigned the mission with the provision that it must be completed in two weeks in order to restore the water to the canals for the Iraqi farmers.

The Horizontal Platoon was assigned the excavation portion of the project—to design and upgrade the existing roads, providing an entrance and an exit road to the stockpile area. The 2d Platoon took charge of the construction portion of the project—to construct the headwalls for the culverts and timber bridges. Before the platoons could begin, the battalion commander required a solid plan for the project and that 100

percent of the materials be on hand. The plan developed by the platoons' leadership called for three teams of Soldiers to place culverts, the road surface, and a timber bridge at each of the sites.

The Challenges

From the beginning of the project, the platoons faced several challenges involving the availability of materials, submerged project sites, emplacement of the culverts, and construction of the bridges.

Materials

The availability of materials proved to be a challenge throughout the project. After requesting the bill of materials, the platoon discovered that some of the critical materials were not available on LSA Anaconda. Once all materials were gathered, the 2d Platoon began the construction portion.

Submerged Sites

Initially, the excavation portion of the project consisted of site preparation and surveyor support to emplace grade stakes. The Horizontal Platoon finished the excavation and site preparations, and the day before construction was to begin, the local farmers opened a valve to increase the canal's water flow. As a result, the project sites and the preparation work lay submerged, setting the project back with a new requirement to pump out the excess water.

The leadership called on local contracting support for assistance. Once the contractors pumped out the water, the Horizontal Platoon again excavated the sites, and the surveyors came out to place grade stakes. At the same time, the bridge team set up site security, dug footers, and set rebar and bolts for concrete placement. The Horizontal Platoon also prepared the ground by filling and compacting the earth canal. The ground was still spongy after the site preparation, so Soldiers tamped the ground with hand tampers until it was sufficiently compacted.

Culvert Emplacement and Bridge Construction

To continue placing the culverts and building headwalls, the Horizontal Platoon made a breach from the earth canal to the concrete canal, allowing water to flow without hindering the project (see article on page 31), and the initially inflexible timeline became somewhat flexible. From the beginning, the Soldiers had pushed to complete the project within the allotted two weeks. But since Iraqi farmers restored water to the canal before the project began, the leadership decided to divert the water instead of blocking it, so they no longer were challenged by the two-week time constraint.

The culvert teams prepared the sites by tamping the ground, squaring off the forms, and placing a rebar cage in the prepared site. While waiting for the concrete to cure, they prepared for the placement of steel culverts.

An M1114 HMMWV and an M917 20-ton dump truck cross one of the newly contructed bridges across the two canals at LSA Anaconda.

The Horizontal Platoon loaded the prefabricated culverts onto a trailer and hauled them out to the sites. Once the 2d Platoon placed mortar onto the concrete footers, the Horizontal Platoon used the crane to lower the culverts into position on top of the mortar, and Soldiers firmly packed in the mortar for culvert stability.

The next task included building the formwork for the headwalls and tailwalls. The culvert teams completed the formwork for the lower lift and placed concrete for the culverts, while the bridge team cut timbers and predrilled holes for placement on the bridge footers.

Building the formwork for the second lift took a little more time than the first lift. To prevent the forms from separating, causing a concrete blowout, the platoon sergeant ensured that the culvert teams did not rush building the formwork. They assembled four rebar cages (which required a lot of cutting and tying wire), connected the cages to the first lift, and built the formwork with plenty of bracing for the second lift. Meanwhile, the bridge team placed timbers onto the bridge footers and bolted them down. The bridge team also predrilled holes in the timbers to be used as girders on the bridge.

After removing the formwork from the headwalls and tailwalls, the culvert teams constructed the formwork for the wingwalls and farside bridge approach ramps. The bridge team placed decking and fascia onto the bridge. The Horizontal Platoon filled and compacted between the culverts and headwalls and tailwalls at both sites to prepare for the road surface, and then the 2d Platoon placed the final concrete for the road surface and nearside approach ramps.

The 2d Platoon finalized the cosmetic work on the bridges, which completed the construction portion. The Horizontal Platoon compacted and graded the approaches and began work on the final phase of the excavation portion—building up the existing road. The Horizontal Platoon filled and compacted the existing road and placed a gravel cap to meet the height of the bridge at each site.

Summary

Placing two culverts in an earth canal and building two timber bridges required attention to detail and a lot of hard work to ensure that the project was successful. But the water flows in the earth canal once again, while dump trucks have a new entrance and exit to the gravel stockpile area. The Soldiers of the 84th Engineer Battalion were able to positively impact both the Army and the Iraqi communities without disturbing the Iraqi way of life.

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