Larry Cloyed’s pulse rate did not quicken when asked about the construction of 53 bridges on the I-495 HOT Lanes project in northern Virginia, but the rhythm of his speech sure did accelerate.

“It’s tough sometimes because each one of those bridges gets its own number, and in Virginia we have a B number for all of our bridges,” the senior project manager for the Virginia Department of Transportation (VDOT) told ROADS & BRIDGES before rattling off the identifiers like an auctioneer. “So you are going to have a B630 and a B638 and a B657 and a B620.” Cloyed then caught a quick breath before finishing with, “and there is no rhyme or reason to that. Sometimes a B620 and a B720 could be side by side, and [the B620] counterpart 621 could be a mile down the road.”

One could not blame Cloyed for turning a little stir crazy while trying to manage one of the most complex road-building projects in the nation through an expedited schedule, one that also includes the construction of four new lanes and the upgrade of 12 key interchanges—all while taking on commuters that attack the corridor during the morning and evening rush like an army of ants swarming a half-chewed piece of food on a hot sidewalk. More than 200,000 motorists work their way around the work zone every day. The eye of this gas-powered storm lies in Tysons Corner, which is one of the busiest shopping/business districts in the U.S.

VDOT and contracting partner Fluor-Lane also have to stay clear of a whole other project crawling by—the Dulles Corridor Metrorail Project.

Indeed, one could not blame Cloyed for having all kinds of breakdowns, but the veteran engineer, aside from the brief and unintentional switch in character, has a calm finger over every switch. Experience has a way of dialing everything down. Cloyed supervised work on the Springfield Interchange, which called for the construction of 50 bridges.
Taking time off

Cloyed was able to pocket a little more time with the Springfield Interchange work. The design-bid-build contract lasted eight years. The nearly $2 billion I-495 HOT Lanes job—which was 68% complete in late April—has been condensed down to almost five years (completion is slated for December 2012). In order to meet the calendar demand, VDOT and Fluor-Lane have added some new twists to accelerated bridge construction. The first is the reduction of stages. Where possible, crews are building one half of the bridge before shifting traffic over and tearing down the old portion. The cycle is repeated for the other half of the span. Cloyed estimated the move has saved about 12-14 months in contract time.

Demolition also has been used to chip away at some of the schedule. One weekend was used to take down the Rte. 123 overpasses on the Capital Beltway. VDOT and Fluor-Lane put as many as five hoe rams, which beat holes through the concrete, on the structures at one.

The concrete pier sections for the Dulles Corridor Metrorail Project weigh up to 45 tons and are on average 10 ft long, 9 ft high and 16 ft wide.
Safety measures at Dulles job look to prevent repeat of fatal accident in Ohio

Back in 2004, the bridge-building industry in North America was shaken after hearing the news that an overhead launching gantry crane, similar to two that are being used on the Dulles Corridor Metrorail Project, collapsed during construction of the Maumee River Crossing in Toledo, Ohio, killing four.

According to an OSHA report, the manufacturer, Paola De Nicola of Italy, required the use of four anchoring bars for each of the four rear legs of the gantry crane and two anchoring bars for each of the two telescoping front legs. OSHA’s investigation revealed that the employer had not designed the pier segments to accommodate each of the anchoring locations due to congestion in the segments with other items such as stressing cables. The report also said the employer used only “a few anchoring bars during the initial launches and as work progressed began using fewer and fewer anchoring bars.” On the day of the accident, the report revealed there were no anchoring bars on the four rear legs and only one anchoring bar in each of the front legs.

To ensure the highest level of safety during the Dulles project, Bechtel has called in truss specialists and operators, who travel the world perfecting their trade, to oversee operations at each of the gantry crane locations. Local union ironworkers also are helping in the assembly, and each of them has to go through training that lasts about a month before being released to do the work.

“There is a process each day with each shift that everyone goes through that briefs them on whatever action that will be taking place that day,” said MacCor-mack. “They talk about specific potentials for safety issues, and that happens at the beginning of every shift.”

For the first time ever, you can see how Bobcat® loaders compete with other brands online.

Visit www.BobcatAdvantage.com/CTL1 to find out who comes out on top.

www.BobcatAdvantage.com/CTL1 1.877.505.3580

Circle 775
Cloyed also mentioned that sometimes crews are able to lift two beams at once if the load is not too heavy. “It’s the old adage that you plan your work and you work your plan,” he said. “For the most part we have made our time frames. I don’t know of any one that pushed us beyond our time frames that were established.”

Getting the equipment to the lift also can require some hard thinking due to the tight urban surroundings. This challenge is magnified when the project calls for the construction of a tall bridge, such as down in phase eight by Cloyed’s familiar stomping grounds of the Springfield Interchange, where a few years ago crews prepped for this type of expansion. Executing this beam placement requires huge cranes, and the landscape often calls for the use of special mats to stabilize the equipment.

“All of that is a bit of a dance you deal with in terms of the choreography of construction,” said Cloyed.

Heavy rail presence

Having the Dulles Corridor Metrorail Project in the vicinity means you have different movements going on the same dance floor.

Owned by the Metropolitan Washington Airports Authority, the heavy rail expansion is being done in two phases, with the Dulles Transit Partners LLC (Bechtel and URS) handling the 11.7-mile work of phase one. When complete, the expansion, unofficially dubbed the Silver Line, will run from East Falls Church, Va., through the Washington Dulles International Airport to Ashburn, Va. The project was 36% complete in late April.

Currently, the Dulles and I-495 HOT Lanes projects are swinging arm-in-arm. With a giant self-propelled overhead launching gantry crane—one of three on the job—Bechtel was manipulating its highest point of bridge construction 55 ft above grade over I-495 in late April. The specialized crane, erecting spans using the balanced cantilever method, lifts segments into place one by one, horizontally outward from each column. The other two trusses in commission elsewhere on the project use the span-by-span method, which hold as many as 15 individual sections at a time.

The open box girder segments, which can weigh up to 45 tons and are on average 10 ft long, 9 ft high and 16 ft

Teams handling the construction of the I-495 HOT Lanes project and the Dulles Corridor Metrorail Project meet on a weekly basis to make sure there is no interruption in work.
wide, are created at a casting yard at the Dulles International Airport. There, each custom segment is match-cast and then moved, one at a time, by semitruck to its unique position in the alignment. Upon arrival, the gantry crane picks up the segment and positions it within the span. The segment then hangs from four high-tensile-strength bars suspended from the truss before temporary alignment and post-tensioning is done. Once permanent post-tensioning takes place, the entire span is set on 400-ton-capacity jacks, and the launching gantry crane then moves to the next span. After the truss leaves, crews then survey the almost completed span to its theoretical location, and after that is executed the top portions of the bearings are grouted and the span is locked down to the substructure.

No physical work is being done over I-495 during the workday, and in order to operate in the tight time frames at night Bechtel is working according to an hourly schedule.

“We take some contingency into account and we have a ‘go, no-go’ cutoff time,” Shawn MacCormack, task manager for aerial construction for Bechtel, told ROADS & BRIDGES. “If the segment is not ready to be picked off at the truck and post-tensioned at that particular time we shut the operation down and we do it the next night.”

Working with the I-495 Fluor-Lane team, which happens to be Bechtel’s biggest competition, has required constant communication and coordination. On a weekly basis the two parties hold informal on-site meetings in actual locations where the work is playing out, and more formal meetings are held every two weeks with the Airports Authority, VDOT and other stakeholders, to work out events over the next 90 days.

“There will be times when we will need to close down lanes and just a little bit up the road from us [the I-495 team] will need to close down a lane,” Leslie Pereira, communications and outreach manager for Dulles Transit Partners, told ROADS & BRIDGES. “So we coordinate all of that very carefully.”

So far everything has run relatively smoothly, which MacCormack credits to six months of preplanning before construction even started. R&B

For more information about this topic, check out the Bridges Zone at www.roadsbridges.com.