

FORM MARKS[®]

FALL 2020



Quality, Safety, Productivity ...
Why **TRUST** Anyone Else?



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SAFETY AWARD4-7

Featuring a contractor that has been recognized for outstanding safety practices on the jobsite.

FORM MARKS®

FALL 2020

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the people in the business of concrete
construction.



Let's talk:

Letters to the Editor

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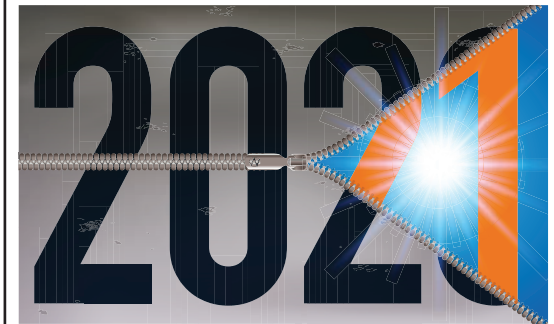
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“

These quotes can be seen
throughout FORM MARKS. They
contain customer feedback given
to EFCO Field Supervisors at the
jobsite.

”

The EFCO PLATE GIRDER® form system
is a registered trademark. This product
was designed for use with products
manufactured by EFCO, and it is
recommended that it not be commingled
with products of other manufacturers'
forming systems.



WHAT A YEAR!

As 2020 comes to an end, I can't help but think that most of us are glad to see it go. Our world and its people have been challenged with more than its fair share of struggle and strife in the forms of hurricanes, wild fires, protests, a global recession and, of course, the biggie—COVID-19. The pandemic literally “touched” everyone on the planet; all 7.8 billion of us. And while vaccines are making their way to destinations around the world, it is speculated that it won't be until June 2021 that the world can begin to breathe a sigh of relief that an end is in sight. There is hope.

As I reflect on my own personal challenges with the pandemic, I am reminded of the words my mother would use to help calm any storm I encountered while growing up. She would say, “It will get better.” Again, hope.

It is truly amazing how fragile and yet resilient mankind is when faced with circumstances that at the time seem quite unsurmountable. We can feel weak and defeated, unloved and unknown. Yet we hope.

There is a quote by Leo Tolstoy that sums it up perfectly. “There is something in the human spirit that will survive and prevail; there is a tiny and brilliant light burning in the heart of man that will not go out no matter how dark the world becomes.”

On January 1, 2021 we face a new year, a new beginning, new change and new opportunities. Wherever you are in the world, EFCO wishes you a healthy and prosperous 2021 filled with opportunity and success and most of all HOPE!

Cathy Howell
VP & Director of Advertising

SAFETY AND PERIMETER PROTECTION IN THE WINDY CITY

CHICAGO, ILLINOIS

Construction is complete on Chicago's Old Town Park Phase 3 Project located near the north side of the city. This slender, modern and sophisticated residential tower was developed by Vancouver-based Onni Group and designed by Chicago firm, Hartshorne Plunkard Architecture. Old Town Park Phase 3 rises 41 stories, contains 456 rental units, office space on its lower levels, a sixth-floor tenant amenity deck and a 193-car garage.

PERIMETER

EFCO partnered with **Adjustable and II in One Contractors** on the project designing both a perimeter protection solution using the EFCO **POWER SHIELD**® and formwork solution using EFCO's **GUIDED RAIL SYSTEM**®. EFCO's **POWER SHIELD** was assembled off-site and delivered to site ready to hang on the perimeter of the tower. This meant the gangs were ready to be quickly picked directly off the truck and flown into place with no additional work. EFCO's **POWER SHIELD** gangs covered four floors with two floors fully screened to provide protection from the elements. Cantilevered look-out decks were provided to assist in the cycling of equipment.

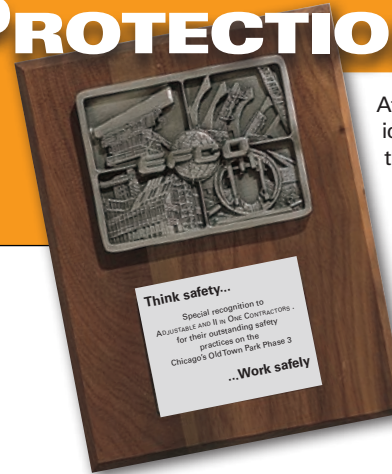
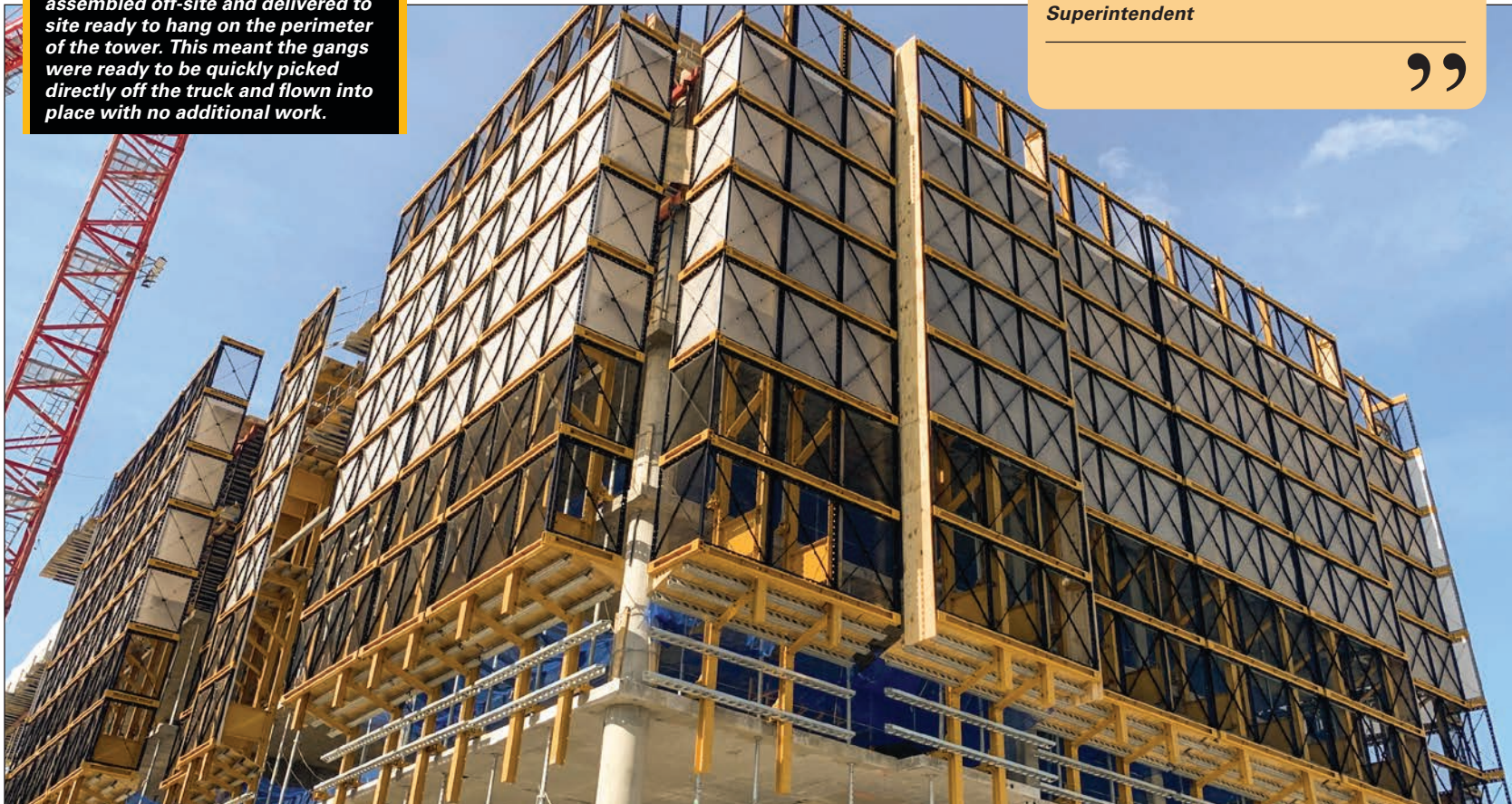
CORE

For the core, EFCO's **PLATE GIRDER**® system was used in conjunction with the **GUIDED RAIL SYSTEM** to provide a rigid assembly using less ties and resulting in a superior finish of the concrete. The **GUIDED RAIL SYSTEM** enables the formwork to stay attached to the wall and cycle easily, even on windy days, reducing the number of days lost due to weather.

► 6



EFCO's POWER SHIELD was assembled off-site and delivered to site ready to hang on the perimeter of the tower. This meant the gangs were ready to be quickly picked directly off the truck and flown into place with no additional work.



At EFCO®, our employees are our most valuable assets. We share this ideology with our customers in that they, too, recognize the value of their employees and the direct impact they have on the business.

EFCO demonstrates our commitment to safety with an Awards Program. Each winner receives a personalized plaque (pictured left) and appears in FORM MARKS® magazine.

“

EFCO's edge protection system really delivered at Old Town Park Phase 3. The gangs were completely preassembled, delivered on time, picked right off the truck and hung quickly. This really saved labor and crane time.

Tim Flores
Superintendent

”

Adjustable is using the GUIDED RAIL SYSTEM® in a +2 configuration which means they can set their deck shoring right to the bottom of the GRS frames. This enables them to cycle their shoring earlier and keep up with aggressive cycles.

EFCO continues to build our long-time working relationship with Adjustable and II in One with great success at Old Town Park Phase 3. ♦

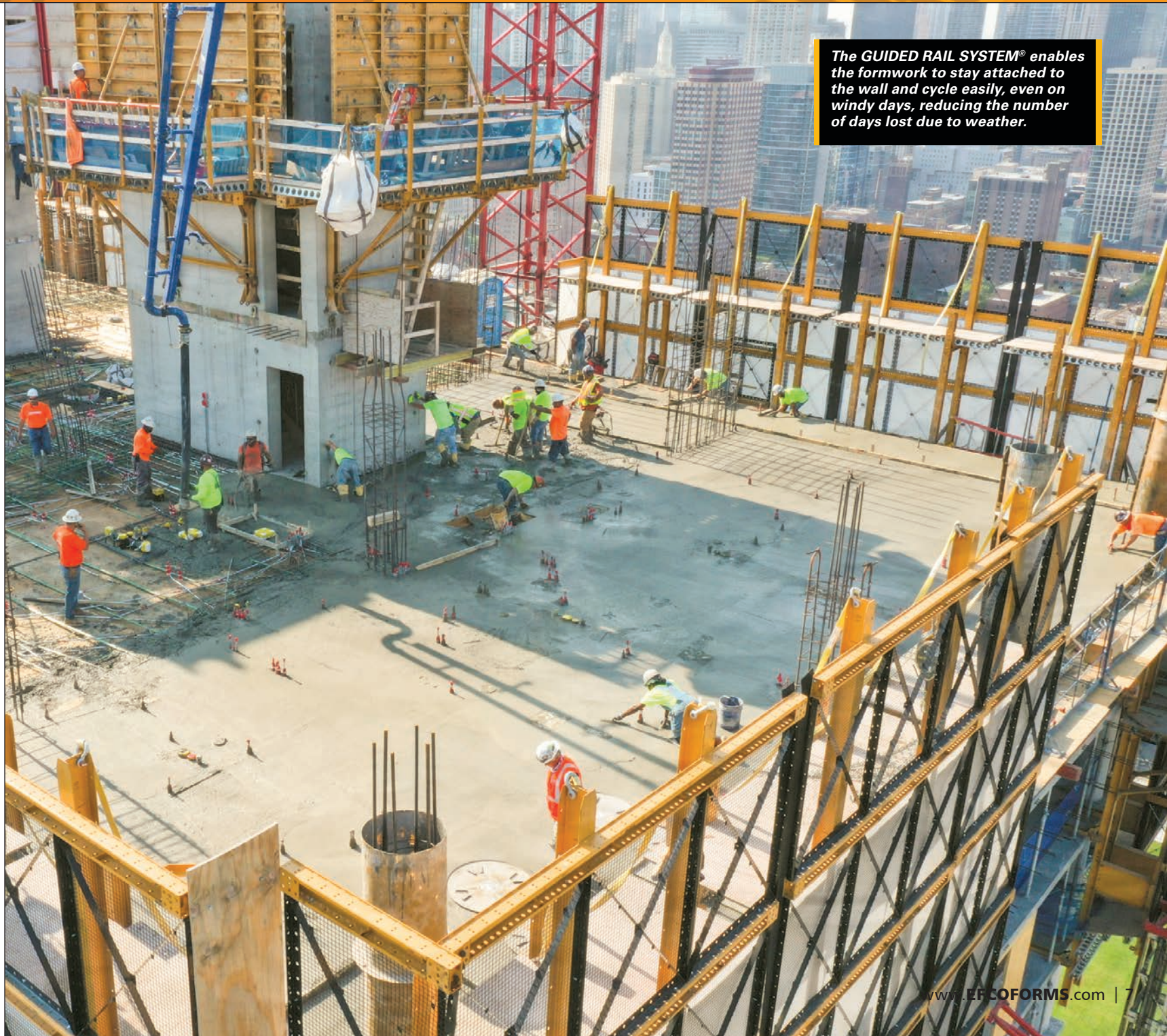
Tim Flores Superintendent
Tim Saunders Sr. Superintendent
Dan Carlson Project Manager
Joben Grimmus.. EFCO Territory Manager
Paul Huisinga... EFCO Sr. Field Supervisor
Tyler Christensen EFCO Engineer

“

We were fortunate to have great partners in EFCO in developing the new POWER SHIELD safety system. A lot of hard work went into the planning and implementation of the system on Old Town Park Phase 3. We are proud of the great job by our team, and appreciate the collaboration with EFCO to make this job as safe and efficient as possible.

*Eric Lindquist, PE, LEED AP
President*

”



The GUIDED RAIL SYSTEM® enables the formwork to stay attached to the wall and cycle easily, even on windy days, reducing the number of days lost due to weather.



HYDRAULICS ON EFCO's SYSTEM LIFT EVENLY, UNLIKE OTHERS ON THE MARKET

Seattle, Washington

Spring Street North Block, also known as Ovation, will have two 32-story towers with 550 residential units, 8,400 ft² (780 m²) of retail and office space and eight floors of underground parking once completed. It is located in the First Hill neighborhood of Seattle. **JTM Construction** is the general contractor on the project, and they partnered with **Ceco Concrete Construction** to provide a full frame concrete solution.

SELF-CLIMBER NEEDED

Ceco Concrete Construction Company has over 100 years of experience in construction. They have a philosophy of collaborating with general contractors and their clients to provide innovative solutions to meet their ultimate goal of providing a quality concrete finish. This is one reason they reached out to EFCO for a self-climber formwork solution on Spring Street North Block.

UNDERSTANDING EFCO'S SYSTEM

Ceco and EFCO have a long history of working together; however, this would prove to be the first time EFCO would provide a self-climber for Ceco in the Seattle market. Once EFCO demonstrated the value of the **POWER TOWER PT-100®** hydraulic lifting system through pre-sales drawings and site visits to ongoing projects, Ceco chose to team with EFCO. Once on board, members from Ceco's project team visited EFCO's *Concrete Construction & Forming Institute* (CCFI) in Des Moines, Iowa to meet with EFCO engineers to review specific project details.

QUICK CHANGES

The twin concrete cores each measure 31'-10" x 34'-2" (9.7 m x 10.4 m) outside to outside with typical wall heights of approximately 9' (2.7 m) tall per floor. Because of their versatility, **PLATE GIRDER®** wall forms require fewer ties and accommodate quick changes, a critical attribute due to the changes in wall thickness as the forms cycled up the building.

A STATE-OF-THE-ART CONTROL SYSTEM

A "plus one" technique was used when pouring the main deck and walls with the lobby slabs trailing behind a couple floors. Each core has four **POWER TOWER PT-100** lifters that support a placing boom on top of the overhead gantry beams and both the interior and exterior **PLATE GIRDER** panels, which hang below those beams. The state-of-the-art **POWER TOWER PT-100** control system allows for simple data entry that, once in operation, auto adjusts the speed of each cylinder to ensure the system lifts evenly. After Ceco hit the typical floors, they are meeting their goal of completing a deck every five days. Construction is expected to be complete in April of 2021.

SAFE, OFF-SITE PREASSEMBLY

Due to a tight project site, EFCO provided preassembly services for most of the components required for the project. EFCO's engineers and field supervisor worked closely with Ceco's project team to provide a design that enabled a safe, off-site preassembly and delivery to the site in units that could be picked from the truck and lowered into place. Communication between all Ceco and EFCO team members created a successful project delivery. ♦

Chris Martinez . Field Operations Manager
Justin Humbert Superintendent
Daryl Osbourn..... Superintendent
Geoff Glass..... Foreman
Jake Chipman. EFCO Sr. Territory Manager
Dennis Philpot..... EFCO Field Supervisor
Taylor Kvidera, PE EFCO Engineer

*The twin concrete cores used **PLATE GIRDER** wall forms. These forms require less overall tie count and allow for quick cycling.*





EFCO's ENGINEERED SOLUTIONS MINIMIZE RECONFIGURATION OF FORMWORK

Charlotte, North Carolina

ONE- AND TWO-SIDED WALLS

Fly and Form Structures, Inc. is building the Charlotte Metro Tower for Duke Energy in Charlotte, North Carolina. The initial portion of the project required one- and two-sided walls for the below grade exterior walls and underground vaults. EFCO **PLATE GIRDER**® panels were used to form tie-less columns.

Many of the walls included corners and pilasters. To accommodate the various conditions, EFCO engineers designed a wall system using **EFCO LITE**® along with EFCO **PLATE GIRDER** and CBC panels for pilasters and corner conditions. Every pour was engineered due to the footing steps, pour lengths and pilaster locations. Also considered was reuse of panel gangs to minimize reconfiguration of walls on site and decrease cycling times.

SUPER STUD: STRENGTH AND VERSATILITY

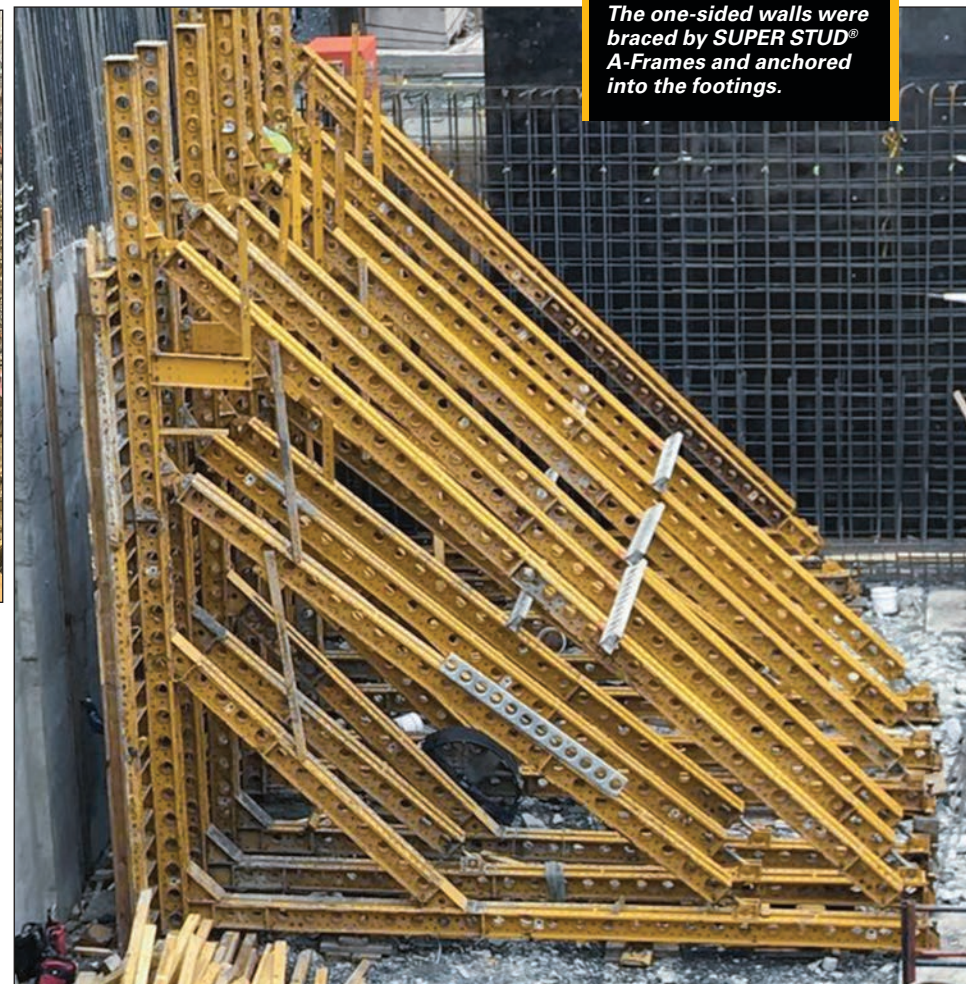
The one-sided walls were braced by **SUPER STUD**® A-Frames and anchored into the footings. The 25' (7.6 m) tall one-sided walls were poured in two 12'-6" (3.8 m) tall lifts. The two-sided pours, using EFCO Rugged Ties, were poured up to 25' (7.6 m) tall. In areas where A-frames could not fit, SUPER STUDS were able to horizontally brace one-sided pours to previously poured walls or columns.



EFCO PLATE GIRDER panels were used to form tie-less columns up to 64" wide.

The poured concrete was completed on schedule with a high-quality finish. The versatility, accessories, and engineering properties of the EFCO SUPER STUD provided a standard leasable forming solution for the numerous different wall conditions. ♦

Ray StevensProject Manager
Alberto PatinoSuperintendent
Rob ReynosoEFCO Territory Manager
Jim Ostrander ..EFCO Sr. Field Supervisor
Dustin Miller..... EFCO Engineer



The one-sided walls were braced by SUPER STUD® A-Frames and anchored into the footings.



EFCO's SELF-CLIMBER Will Make Your Job EASIER Too

Brentwood, California

HIGHRISE

The Landmark II project is the first residential highrise built west of I-405 in 40 years and will be the tallest building in West Los Angeles. It consists of 34 stories above grade and will be 40 stories in all. The finished size will be 415,000 ft² (38,555 m²) and will include 376 new apartments.

THE PLATE GIRDER ADVANTAGE

Largo Concrete, Inc. has chosen EFCO forming systems for the cast-in-place concrete elevator and stair cores making up the structural backbone of the building. Both cores are being formed with **PLATE GIRDER**® formwork to maximize the tie spacing. For these 10'-2" (3.1 m) tall typical walls, only two rows of wet ties and one dry tie are required at up to 8' (2.4 m) spacing horizontally. Hinges were incorporated into all interior and exterior gangs to allow for face sheet access and for rebar to be charged from the outside. In the design phase, EFCO engineers worked with Largo to avoid interference between ties, overhead beams and jam steel, as well as include pass-through openings for easy access inside the cores.

STAIR CORE

The stair core formwork is supported by a flipper deck and is cycled by crane. EFCO's Retractable Stripping Corners allow the inside forms to be stripped without disassembly. After stripping, the interior formwork, the flipper deck and the trailing deck can all be cycled in a single pick. Once the flippers lock into the next position, vertical form alignment can be made with built-in plumbing screws.

ELEVATOR CORE

The elevator core formwork is supported by EFCO's self-climbing **POWER TOWER PT-100**® system. When it's time to cycle, the system lifts to the next designated floor height at the push of a button. During the cycling process, the operator has the freedom to control the system from anywhere on the core by using either a wired or wireless remote. Both the interior



EFCO's Hydraulic Stripping Corners made for faster cycling with less labor.

Using PLATE GIRDER formwork on the core walls allows for maximum tie spacing. For these 10'-2" (3.1 m) typical walls, only two rows of wet ties and one dry tie are required at up to 8' (2.3 m) spacing horizontally.



and exterior forms are carried by overhead beams, enabling exterior forms to be rolled back for easy stripping. The interior forms include EFCO's hydraulic stripping corners that give the ability for the forms to be stripped and then reset in a matter of seconds with the push of a button. ♦

Mike DanielProject Executive
Landon ArcieroProject Manager
Morgan WallaceProject Manager
Kyle ForbesSuperintendent
Ernesto JimenezForeman
Cody O'Neil EFCO Sr. Territory Manager
Kristian Aguilar.... EFCO Field Supervisor
Taylor Kvidera, PE EFCO Engineer



CONSTRUCTING A LUXURY APARTMENT BUILDING

Buenos Aires, Argentina

"Terrazas Barrio Parque" will be a luxury apartment building with a long list of amenities that attract today's apartment seekers. In the northern area of Buenos Aires, we find "Barrio Parque," the most elegant and highest value real estate in the city. The project has an exclusive location, surrounded by luxury houses, mansions and embassies, and is close to the recognized Malba Museum (Museo de Arte Latinoamericano de Buenos Aires).

PROJECT SIZE

With an investment of \$100M, the contractor, **Creaurban S.A.**, started on-site at the end of February 2019. The construction is made up of a main block, which begins at level 0 and rises to level 7. Below level 0 there are two parking levels, storage rooms and a covered pool, for a total area of 450,000 ft² (42,000 m²). Each level has six apartments; each apartment has a surface area of more than 3,230 ft² (300 m²) and an individual pool.

SYSTEMS USED

To carry out this project, Creaurban S.A. relied on EFCO to provide an elevated slab shoring solution for typical floor to floor heights as well as areas reaching 49'-3" (15 m). The systems used were **EFCO DECK®** and **E-Z DECK®**. They used EFCO DECK for the parking area, as it significantly sped up the assembly and cycling. The E-Z DECK shoring system was used in the area of the apartments with great heights due to its ability to easily adapt to the different levels. Walls and columns were formed using EFCO's handset **HAND-E-FORM®** system.



The E-Z DECK shoring system was used in the area of the apartments with great heights due to its ability to easily adapt to the different levels.

For the "Terrazas Barrio Parque" Project, it was Creaurban S.A. first experience using EFCO equipment. It was a complex challenge but thanks to an excellent partnership, the deadlines required by the project could be accomplished. ♦



Rubén Maidana Production Leader
Alejandro Lobelos Superintendent
Denise Santoro Superintendent
Pablo Benaim Superintendent
Celeste Casares... EFCO Territory Manager
Roberto Janco EFCO Field Supervisor
Gaston Campagnolle EFCO Engineer



SAFETY AND PERIMETER PROTECTION, NOT TO BE OVERLOOKED

La Florida, Santiago, Chile

CONSTRUCTION OF HIGHRISES

The new Icalma Project located in the southeast part of Santiago, Chile, includes the construction of four residential apartment towers.

The construction started with the D Tower that will have 21 floors plus two underground levels with an area of 9,635 ft² (895 m²) per floor. Each floor will have 12 apartments ranging from 334 ft² to 872 ft² (31 m² to 81 m²) each with one, two and three bedrooms.

PRO 4 AND E-Z DECK FOR SHORING

As a long-time user of EFCO systems, once again EBCO S.A. chose EFCO PRO 4® for support of the simple-height slab due to the simplicity and speed in its assembly.

For the high slabs in the access hall, the tanks and the ramps, the contractor chose EFCO's E-Z DECK® due to its versatility and safety.

PERIMETER SAFETY

To safeguard the crew, EBCO S.A. chose EFCO's POWER SHIELD®. It is a protection system that surrounds the perimeter of a building while under construction, creating an efficient and safe working environment. EBCO is EFCO's first customer in Chile to use this innovative system. EFCO provided 29 screens of different dimensions. Eighteen screens were anchored to the slabs, another

nine to the blank walls, and two exterior screens called "lookouts" were used for bundling and transporting the equipment. EFCO also provided special on-site training for the crew where they learned how to assemble, install and operate the POWER SHIELD system. ♦



In addition to the safe environment, a contractor will experience higher productivity levels from a secured working environment.

Nestor Díaz.....Project Administrator
Mirko Buljevic.....Project Engineer 1
Cristian Corominas.....Project Engineer 2
Toribio Mora....EFCO Sr. Territory Manager
Sergio Malschafsky .EFCO Field Supervisor
Manuel Henríquez EFCO Engineer

The POWER SHIELD system is designed to provide weather protection for construction workers while also protecting workers and pedestrians from falling debris.



“

POWER SHIELD has provided a greater safety level to work at height and a better rate of progress, especially at the slab shoring.

*Cristian Corominas
Project Engineer*

”



You Will Likely Become A Repeat Customer Too

Lambayeque, Lima, and Cusco, Peru

In recent years, EFCO del Peru has been involved in the construction of most of the country's shopping centers, being the main supplier of shoring and formwork for this type of construction. The foregoing is the result of the high capacity and versatility of the **E-Z DECK®** shoring system, and the **HAND-E-FORM®** formwork system is used for the construction of beams, plates and columns. EFCO's involvement in the construction of three shopping centers: Mall Aventura Chiclayo, Mall Aventura San Juan de Lurigancho and Real Plaza Cusco Expansion are a testament to the confidence bestowed by the market to EFCO products. Information about each of these three construction projects follows.

MALL AVENTURA CHICLAYO

Location: Lambayeque - Peru

With an investment of about 182 million Soles over a land area of 527,500 ft² (49,000 m²), the new Mall Aventura de Chiclayo is being erected at the crossroads

of the North Panamerican Highway and Avenida Circunvalación. This project is expected to be the largest in the northern part of the country when complete.

HV Contratistas S.A., the contractor for this project, chose to partner again with EFCO based on good results they had in the construction of the Real Plaza Puruchuco Shopping Center and their past positive customer service experience. The construction was distributed in one basement plus three upper floors. The **PRO 4®** shoring system was used for the single-height ceilings and E-Z DECK was used for the double-height ceilings. In the case of the columns, the **EFCO LITE®** system and the **HAND-E-FORM** system were used.

Nelko Zlatar..... Project Manager
Simón Maldonado Resident Engineer
Christian Pasapera Production Leader
Carlos Vizurraga. EFCO Territory Manager
Christian Arteaga..... EFCO Field Supervisor
Daniel Fernandez EFCO Engineer

MALL AVENTURA SAN JUAN DE LURIGANCHO


Location: Lima - Peru

Over the past five years, **De Vicente Constructora** has been working closely with EFCO in the construction of different kinds of shopping center projects, educational buildings, and warehouses. EFCO's experience and knowledge along with the versatility and efficiency of its various systems make it the most competitive solution on the market in terms of double-height construction. Now De Vicente and EFCO are working together on the construction of Mall Aventura San Juan de Lurigancho. This project consists of a slab and beam shoring solution for "Front 3" of the mall, which is approximately 35 percent of the total construction work. Plus, about 43,100 ft² (4,000 m²) of ceiling

formwork was contracted with EFCO. The customer recognizes and likes that EFCO's engineered solutions are designed with a minimum number of parts per square meter of roof space compared to other shoring systems on the market. EFCO's formwork solution for the slab used support from the beam shoring for slabs with lengths up to 13'-2" (4 m) between beam faces without having any intermediate floor support. All of this is due to the high capacity of the E-Z DECK posts together with the **E-BEAM®** and **Z-BEAM®**.

Mauricio Labarthe..... Project Manager
Wilfredo Asencio..... Resident Engineer
Álvaro Vasquez Production Leader
Carlos Vizurraga. EFCO Sr. Territory Manager
Freddy Vite EFCO Field Supervisor
Daniel Fernandez EFCO Engineer

► 20



E-Z DECK posts together with EFCO E-BEAMS® and Z-BEAMS® were used for construction of Mall Aventura de Chiclayo.



The EFCO E-Z DECK system was used to shore the double-height ceilings at Mall Aventura San Juan de Lurigancho.



The EFCO E-Z DECK system is versatile and can be reconfigured to accommodate variable floor-to-ceiling heights.

AMPLIACIÓN REAL PLAZA CUSCO

Location: Cusco - Peru

Construction of the Real Plaza Cusco Expansion was awarded to a consortium formed of three companies **Grupo 5 S.A.C., Delgado Lira S.A. and Constructora Mech S.R.L.** These three companies chose EFCO to supply formwork and shoring for multiple reasons. One of them was the location of the warehouse for dispatching equipment, as the

work was in Cusco and EFCO del Peru has a satellite warehouse in the city of Arequipa. This shorter distance, compared to other companies that had their warehouses in Lima, substantially reduced back and forth transportation costs for equipment. Besides location, the three customers understood the benefits and advantages of **E-Z DECK®** shoring systems in terms of productivity. ♦

Fritz Hernandez Resident Engineer
Williams Benavente Production Leader
Jaime Espinoza Production Leader
Karin Concha EFCO Territory Manager
Freddy Vite EFCO Field Supervisor
Daniel Fernandez EFCO Engineer





A SHORING SYSTEM TO INCREASE YOUR PRODUCTIVITY, AND A RESORT TO LEAVE YOU BREATHLESS

Cancun, Mexico

CONSTRUCTION OF NEW RESORT AND SPA

Once again, the Mexican Caribbean offers an alternative for tourists to enjoy unforgettable vacations!

Hotel Breathless Cancun Resort & Spa is a complex located on Boulevard Kukulcan, a popular hotel zone in Cancun. The resort will have 429 rooms and suites where tourists will be offered an all-inclusive luxury vacation package.

Puente Calinda, the construction company in charge of carrying out this project, decided that EFCO would be the best ally in constructing it in a timely manner because of the excellent forming and shoring solutions EFCO offers.

HIGH CAPACITY STRENGTH

The use of the **E-Z DECK**® system, with mono-posts and tables, was chosen to shore the mezzanine slabs with curved geometries on the slab edges for the parking lot building. The **E-Z DECK** system is also being used for the main tower of the hotel with its cantilevered slabs in the shape of small triangles. The **E-Z DECK** system is

proving its high capacity strength, safety and versatility on this project and will save the customer both labor and time.

EFCO FORMWORK IS EASILY RECONFIGURED

Because of the ability to configure the **EFCO LITE**® system into different configurations on the fly, it was the best formwork solution for this project. It provided the contractor with the required productivity, as well as providing excellent concrete finishes.

The walls of the cistern, perimeter and elevator cores were formed with the **EFCO SUPER STUD**® and **E-BEAM**® system and the **PLATE GIRDER**® system because they gave the builder the best versatility and efficiency, since they can be reconfigured for all of the different elements using very little equipment. ♦

Raúl Gete Project Manager
Pablo Hita Superintendent
Rosalio Ramos... EFCO Territory Manager
Rosalio Ramos..... EFCO Field Supervisor
Francisco Ortega EFCO Engineer



Because of the ability to configure the EFCO LITE system into different configurations on the fly, it was the best formwork solution for this project.



The E-Z DECK system is proving its high capacity strength, safety and versatility on this project and will save the customer both labor and time.



EFCO's PLAN Uses LESS EQUIPMENT

Charles City, Iowa

A NEW WASTEWATER TREATMENT PLANT

The City Council of Charles City, Iowa approved a \$16.4M resolution to modify the city's existing wastewater treatment plant. With the modifications, the new plant has a life expectancy of 40 years. **Portzen Construction, Inc.** of Dubuque, Iowa was awarded the bid for the construction of the plant modifications.

EFCO LITE SYSTEM

In June of 2020, Portzen Construction started work utilizing **EFCO LITE**® to form all of the straight walls in both the sludge plant and the reed beds. By having the rebar and bulkheads completed ahead of time, the crew was able to cycle 66' (20.1 m) of formwork and pour 15'-9" (4.8 m) tall walls on a daily basis. EFCO LITE was an excellent choice for these walls as Portzen cycled the forms in just four crane picks. EFCO LITE forms were easily built in four gangs of 33' (10.1 m) long x 16' (4.9 m) tall.

REDI-RADIUS SYSTEM

In July, Portzen received EFCO's **REDI-RADIUS**® to form the curved walls in the sludge plant. The sludge plant contained curved walls with three different radii: 18'-6" (5.6 m), 23'-6" (7.2 m), and 27'-6" (8.4 m). The REDI-RADIUS system was the ideal solution for this job as it offers the capability of being easily reshaped on-site. The same REDI-RADIUS panels could be reshaped for both the inside and outside radius walls.

E-Z DECK SYSTEM

In October, Portzen utilized EFCO's **E-Z DECK**® to shore the elevated slabs at each end of the sludge plant. Portzen was able to shore 2,183 ft² (203 m²) of concrete slab and beams with just 16 E-Z DECK towers. The towers were built 19'-8" (6.0 m) tall to support a 12" (300 mm) thick slab containing up to 4' x 2' (1,220 mm x 610 mm) drop down beams.

The additions and renovations for the Charles City Wastewater Treatment Plant are expected to be complete by the fall of 2021. ♦

“

With less ties to worry about and the ease in which the forms can be aligned, the process of setting, pouring and stripping the EFCO forms is faster than other gang form systems I have used. This allowed us to make more pours in a shorter time frame. On jobs with tight schedules every day it makes a huge difference.

Chris Riemenapp
Jobsite Foreman

”

Tom Russett Jobsite Superintendent
Chris Riemenapp Jobsite Foreman
Julian Nixon..... EFCO Territory Manager
Matt Harrington EFCO Field Supervisor
Nathan Witte..... EFCO Engineer



Portzen was able to shore 2,183 ft² (203 m²) of concrete slab and beams with just 16 E-Z DECK towers.



EFCO LITE was an excellent choice for these walls as Portzen cycled the forms in just four crane picks.



HELPING PROTECT THE OTTAWA RIVER

Ottawa, Ontario, Canada

NEW SEWAGE TUNNEL

The \$232.5M Combined Sewage Storage Tunnel (CSST) Project will reduce the frequency of sewage overflows from Ottawa's aging combined sewers during storm events from entering the Ottawa River, helping to protect the river. The project consists of two tunnels, one running east-west and one running north-south through Ottawa's downtown area. The tunnels will have a capacity of 463,000 ft³ (43,000 m³) of sewer overflow during rainfall events. The water will then be able to be treated and returned safely to the Ottawa River. **Dragados Tomlinson JV** was chosen by the City of Ottawa to build the tunnels and access shafts for this important project.

SHAFTS

The access shafts for the tunnel boring machine at either end of the tunnels are 10 m diameter, one-sided round shafts. The customer chose EFCO to provide **REDI-RADIUS® Jr.** forms in a compression ring configuration for the shafts. The concrete placed in the secant piles used for excavation was not strong enough to resist any tie loading. This required a tieless solution, so the compression ring was decided to be the best option for the project.

SHORING

The roof slabs of the shafts were formed using EFCO **E-Z DECK®**. The E-Z DECK towers were placed to match the **REDI-RADIUS** pour heights and provide a stable working platform from which the rebar could be tied and the forms could be set and stripped at each lift. Once at the ground

level, the slabs were easily poured due to the shoring already being in place.

Dragados Tomlinson JV is nearing completion on this exciting, environmentally friendly project for Ottawa and the surrounding areas. ♦

Richard Poulin Project Manager
Michael Cyr Project Superintendent
Michel Pilon Project Foreman
Alex Lacasse EFCO Territory Manager
Richard Wilder EFCO Field Supervisor
Niels Wilken EFCO Engineer



INTEGRATED STRAP

EFCO REDI-RADIUS® Sr. panels have an integrated strap that adjusts to any radius greater than 18'-0" (5.5 m) with no loose pieces. If a tighter radius is required, EFCO offers the REDI-RADIUS Jr. with a minimum radius dimension of 9' (2.75 m).



The access shafts for the tunnel boring machine at either end of the tunnels are 32'-10" (10 m) diameter, one-sided round shafts.



EFCO provided REDI-RADIUS Jr. forms in a compression ring configuration for the shafts.



EFCO's Box CULVERT TRAVELER FOR TUNNELS

Storrs, Connecticut

Camputaro & Son Excavating was tasked with construction of the MEP (Mechanical-Electrical-Plumbing) utility piping and support tunnel reaching from the new power plant to the existing utility tunnel on the UConn campus.

PROJECT DETAILS

Camputaro & Son Excavating partnered with EFCO to supply the EFCO **Box Culvert Traveler** system to form the tunnel. The Box Culvert Traveler system is configured to pour this culvert-like utility tunnel, measuring approximately 1,000 LF (305 m) long with a 16" (400 mm) thick roof slab, supported by a 10' (3.1 m) high walls that will be cast-in-place monolithically. The structure consists of a 4" (100 mm) base mud slab, 15-1/2" to 12-1/2" (395 mm to 320 mm) pitched footing slab with cast in gutter, 12" (300 mm) thick walls at 10' (3.1 m) high, 16" (400 mm) thick roof slab at 14'+ (4.3 m+) wide. Walls and roof are monolithically poured in 60' (18.3 m) long segments.

The traveler is constructed using EFCO **PLATE GIRDER**® forms in 62' (19 m) lengths. Construction of this tunnel started in August of 2020 and is expected to be complete in March of 2021. ♦

Doyle Lynn Superintendent
Rob Manchester Superintendent
Nick Miano Project Manager
Bob Catani EFCO Territory Manager
Lou Szabo EFCO Sr. Field Supervisor
Joel Lindberg EFCO Engineer



The traveler is constructed using EFCO **PLATE GIRDER**® forms in 62' (19 m) lengths.

“

EFCO's system is very simple, efficient and convenient to use with quality finish results. EFCO support staff was extremely helpful in teaching and supporting our workforce during set up, placement and cycling.

Doyle "Buddy" Lynn
Superintendent

”



RADIAL WALLS ARE EASY WITH REDI-RADIUS

Village of Coxsackie, New York

UPGRADE TO WASTEWATER TREATMENT FACILITY

The Village of Coxsackie, New York is growing and in the process of upgrading and expanding the existing wastewater treatment facility. One of the improvements included the addition of a secondary clarifier tank. Located on the banks of the Hudson River with very little open area to work, **Kubricky Construction Corp.** came up with a plan and then were awarded the contact.

TANK CONSTRUCTION IN RAPID TIME

Kubricky Construction has decades of experience in bridge construction using EFCO formwork. Their challenge of forming a round tank for the first time was simplified using EFCO **REDI-RADIUS®**. The plan worked, and the tank was completed in record time and with a great "as-struck" finish.

Kubricky Construction, using only six workers, was able to start forming and setting panels the same day they arrived, right off the truck. They were able to assemble the entire tank and pour the concrete in 10 working days. The forms were stripped, banded and shipped back to the EFCO warehouse the following week.

Kubricky Construction needed to get the tank constructed in rapid time and did not want to spend time fabricating complicated water stops. Kubricky asked EFCO to design the 46' (14 m) diameter x 14' (4.3 m) tall walls of the tank to be completed in one pour (360 degrees). EFCO engineered systems, as always, reduced the number of form ties needed along with providing a superior concrete finish. Kubricky was glad they chose to use the EFCO REDI-RADIUS system.

The 46' (14 m) diameter tank design had external boxes on the outside of the tank wall with several rebar protrusions. Using the faceless REDI-RADIUS dowel rod panels, Kubricky saved time by eliminating secondary pours and saved money from the added cost of buying rebar form inserts. ♦

“

The tank and concrete finish came out excellent!

Cale Gleason
Concrete Superintendent

”

Robert Montague Project Manager
Randy Rathbun ... General Superintendent
Cale Gleason Concrete Superintendent
Joann Burrridge Project Engineer
Paul Biehler EFCO Territory Manager
Rick Lynch EFCO Field Supervisor
John Lust EFCO Engineer

“

EFCO made the rental process very easy and stayed involved throughout the project from conceptual form designs and options, through technical on-site support during erection and fast accurate deliveries. Kubricky Construction looks forward to partnering with EFCO again in the future.

Rob Montague
Project Manager

”

Kubricky Construction was able to assemble the entire tank and pour the concrete in 10 working days.





ONE KEY TO CYCLING FORMWORK QUICKLY IS EFCO'S COMMON BOLTING PATTERN

Calgary, Alberta, Canada

NEW BRIDGE OVER BOW RIVER

Construction is underway for Stoney Trail and Tsuut'ina Trail, both portions of Calgary's Southwest Ring Road consisting of a total combined length of 101 km (63 miles) and a completion date of 2024. Part of the overall project involves twinning the existing NW bridge that crosses the Bow River to handle the additional traffic from not only the expansion, but the increase in density from the NW quadrant of the city.

The existing bridge, which was constructed well over a decade ago, has enormous hourglass-shaped piers that were replicated in the design of the new bridge structure. The piers are different heights with the tallest being 115' (35.0 m) tall. The bridge superstructure consists of a cast-in-place segmental box girder design, which incorporates the bridge deck into the girder segments.

FORMING THE INTRICATE PIER COLUMNS

EFCO was very proud to team up with Flatiron Aecon, JV to form these very intricate piers. The design incorporated EFCO's renowned **PLATE GIRDER**® system for heavy construction along with custom fabricated, radiused panels designed to bolt directly to the standard EFCO equipment. The legs of each pier measure 11'-5" x 9'-10" (3.5 m x 3.0 m) and were poured on a 6° angle from plumb. The outer part of the legs also

have a chamfer 1'-7 5/8" x 1'-7 5/8" (500 mm x 500 mm), which was supplied by EFCO as a modular bolt up form. Each pier was formed in five lifts, which meant using EFCO's Support Bracket system.

FORMING THE PIER SEGMENTS

Once the pier columns were complete, a pier table falsework system was installed to cast the pier segments which were formed using a combination of EFCO's E-BEAM® and SUPER STUD® forming equipment and **PLATE GIRDER** forms where possible. The form set up also required the use of EFCO's high capacity aluminum **E-Z DECK**® shoring system and SUPER STUD support frames. ♦

Adrian Padilla Project Manager
Ramon Sanchez..Bridge Substructure Manager
Kyle HendrikxDeputy Project Director
Phil VilaySuperintendent
Todd Sanborn.....Superintendent
Jeff Dergousoff.. EFCO Sr. Territory Manager
Robert Cottam..EFCO Sr. Field Supervisor
Paplu Paul, PE .EFCO Substructure Engineer
Chris Manson .EFCO Superstructure Engineer



Once the pier columns were complete, a pier table falsework system was installed to cast the pier segments which were formed using a combination of EFCO's E-BEAM® and SUPER STUD® forming equipment and **PLATE GIRDER** forms where possible.



TOLLWAY EXTENSION INCLUDES OVER 80 PIERS

Collin County, Texas

A SYSTEM DESIGNED FOR GREATER POUR PRESSURES

Austin Bridge and Road, Inc. (ABR) was contracted by the North Texas Tollway Authority (NTTA) to extend the Dallas North Tollway across US-380 in northern Collin County. This project consisted of constructing two main-lane bridges at 3,840' (1,170 m) each, two ramp bridges at 830' (253 m) long each and widening four existing bridges at 400' (122 m) long each. The project design required over 200 rectangular columns measuring 4' x 6' (1.2 m x 1.8 m) and ranging in height from 2' to 34' (0.6 m to 10.4 m) tall. At the top of each column was a 12' (3.7 m) capital. This increased the height of the column by 12' (3.7 m), which equates to 5,830 CY (4,465 m³) of concrete. With these large column heights, the contractor wanted to maximize the allowable pour pressures and chose EFCO's **HS PLATE GIRDER**® system. The system is designed for increased pour pressures, which enabled ABR to increase the pour rates and decrease the amount of time required to pour these columns. Using this system saved money in both the labor required and the equipment required and also decreased the time to cycle a set of column forms. It was a win-win situation for both EFCO and ABR.

PROVIDING A QUALITY CONCRETE FINISH

In addition to the columns, there are over 80 caps that contain 5,000 CY (3,825 m³) of concrete which ABR chose EFCO to supply its original **PLATE GIRDER** forming system. NTTA utilizes a special specification that is above and beyond the typical off-the-form finish TxDOT requirement. The special specification 850 demands that the "concrete

provided contains minimal color variation and uniformity in the concrete surface finishes for the visible portion of precast, cast-in-place, and slip-formed concrete structures. Apply enhanced production and quality process to the structures covered under this special specification." ♦

Paul Simanek.....Sr. Project Manager
Bob Kaiser.....General Superintendent
Larry Fulton... EFCO Sr. Territory Manager
Kristin Wasson.....EFCO Engineer



EFCO's HS PLATE GIRDER system is designed for increased pour pressures which enabled ABR to increase the pour rates and decrease the amount of time required to pour these columns.



PLATE GIRDER HANDLES THIS MASSIVE SINGLE POUR

Miami, Arizona

BRIDGE TO PROVIDE ACCESS TO PARTS OF EASTERN ARIZONA

Built in 1949, the Pinto Creek Bridge was recently determined to be structurally deficient by today's standards. Located approximately an hour outside of Phoenix, the bridge sits high above the creek bed along US60 and provides needed access to the eastern parts of Arizona. In order to minimize the impact on the busy travel route, its replacement was designed to be built adjacent to the existing structure with traffic flipped onto the new route once complete.

Ames Construction was awarded the replacement project in the summer of 2019. The new structure was to consist of three bridge bents towering above the ground below. Each bent consisted of two 10' x 10' (3 m x 3 m) concrete piers with heights of 56' (17.1 m), 109' (33 m) and just over 136' (41.5 m) tall for the center pair. Topping each pair of columns was a magnificent concrete arched pier cap measuring 47' (14.3 m) long x 22' (6.7 m) tall and 10' (3 m) wide.

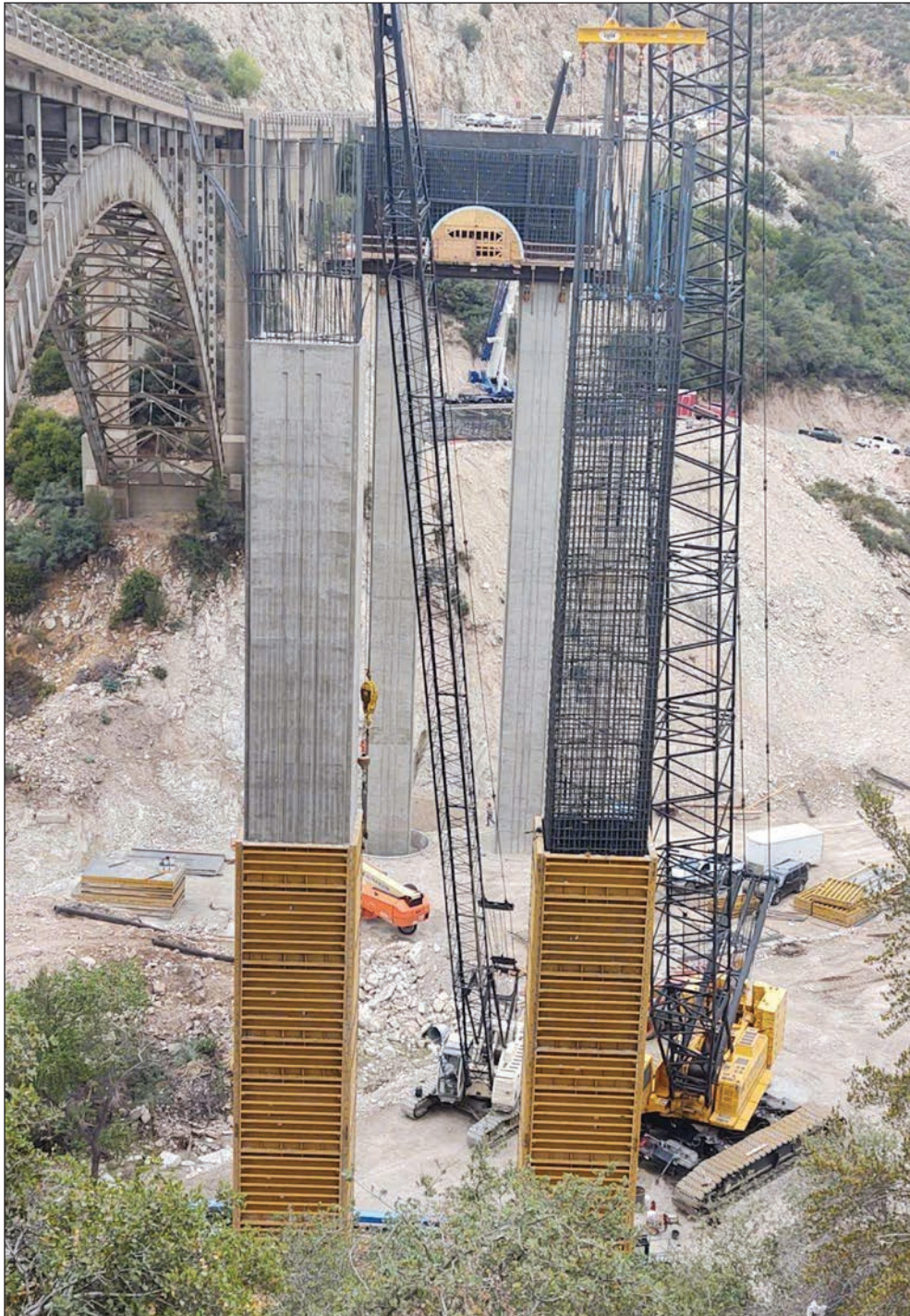
TALL PIERS

Ames started off the structures by planning to pour the pier's full height. EFCO's **PLATE GIRDER**® form system was the best way to ensure safety and strength on such a massive single pour, while enabling a

► 40

Standing over 136' (41.5 m) above the creek floor, the pier caps were supported by EFCO support brackets, Ames' W-Beams and EFCO E-BEAMS.





Each bent consisted of two 10' x 10' (3 m x 3 m) concrete piers with heights of 56' (17.1 m), 109' (33 m) and just over 136' (41.5 m) tall for the center pair.





completely tieless column form design. After 524 yd³ (400 m³) of concrete were placed in 23 hours, the first of the two center piers was complete as the second set of formwork was put into place. With the tallest of the columns done, equipment was gang cycled to the remaining bents.

PIER CAPS

Standing over 136' (41.5 m) above the creek floor, the pier caps were supported by EFCO support brackets, Ames' W-Beams and EFCO E-BEAMS®. Above the dance floor, *PLATE GIRDER*® wall panels were used to form the cap sides and support the custom-built radial arch soffit panels. ♦

Doran Emery Structures Manager
 Brad Steward..... Superintendent
 Dan Meyertholen Project Engineer
 Bill Salus EFCO Sr. Territory Manager
 Jill Provost EFCO Engineer



Topping each pair of columns was a magnificent concrete arched pier cap measuring 47' (14.3 m) long x 22' (6.7 m) tall and 10' (3 m) wide.





A PARTNERSHIP THAT PROVIDED PRODUCTIVE RESULTS

Berkshire County, United Kingdom

SMART UPGRADES

The UK is currently in the process of upgrading the existing motorway network to incorporate smart technologies into the system. These upgrades are aimed at increasing traffic flow, managing incidents and providing more reliable journey durations at times of peak use.

MODIFICATION TO BRIDGES

The M4 is a primary route connecting London to the southwest of the county, and the project to upgrade Junctions 3 to 12 to a Smart Motorway included widening areas of the road as well as introducing the management features to improve the flow of an estimated 130,000 vehicles per day. At a cost of £850m (\$1.1B), the project included installation of a number of replacement bridge structures and widening of the large Thames Bray Bridge that carries the road over the river.

SWORD PARTNERS WITH EFCO

EFCO UK have been supplying a combination of **PLATE GIRDER**®, **SUPER STUD**® and **E-BEAM**® components to **Sword Contracts** to complete the construction and modification of the new bridges at Marsh Lane, Ascot Road, Monkey Island, Recreation Ground Road, Datchet Road and Thames Bray.

Bases, abutments, piers, wing walls and parapets have all been formed utilizing the versatile EFCO systems. The project is on schedule to be complete early in 2022, helping to minimize disruption on this critical piece of national infrastructure. ♦

“

It is a testament to the strength of the Sword/ EFCO partnership that despite the bulk of this project occurring during the height of a national lockdown, we were able to deliver designs, solutions and on-site operations to the challenging schedule. The project will be completed ahead of time and to the highest standard.

Jimmy Goodwin
Contract Manager

”

Frazer Sword..... Owner Sword Contracts
Jimmy GoodwinContract Manager
Chris RobisonEFCO Territory Manager
Colin Walker EFCO Sr. Field Supervisor
Stuart De Freyne.....EFCO Engineer
James Wood.....EFCO Engineer



Updates to the Thames Bray bridge in the UK is one part of the current motorway networks SMART upgrade.



EFCO supplied SUPER STUD and E- BEAM components to Sword Contracts to support the parapet beam of the bridge at Monkey Island.



CONSTRUCTION OF A NEW ICON TO THE LANDSCAPE

Between Cebu City and the Municipality of Cordova, Philippines

MAJOR INFRASTRUCTURE FOR CEBU - 3RD BRIDGE

The Cebu-Cordova Link Expressway (CCLEX) Project is an iconic landmark that will rise between the skyline of Cebu City and the Municipality of Cordova.

The CCLEX Bridge is expected to boost economic growth and drastically reduce the traffic density in the area. It will help decongest the two existing bridges, Marcelo Fernan Bridge and Mandaue Bridge, and will serve as an alternative route between Cebu City and Mactan-Cebu International Airport (MCIA), reducing travel time by approximately 40 minutes.

The bridge (CCLEX) will have a total length of 5.3 miles (8.5 km) with two lanes in each direction. The main span will be cable stayed, 1,280' (390 m) long and will be supported by twin tower pylons, 475' (145 m) tall each. It shall have a navigation clearance height of 168' (51 m) (vertical) and 855' (260 m) (horizontal) to enable ships to traverse under safely. Two viaduct approach bridges and a causeway will also form part of the bridge with toll road facilities designed and inspired from the eight-rayed sun of the Philippines Flag on the artificial island.

Cebu Cordova Link Expressway Corporation (CCLEC), which is a subsidiary of Metro Pacific Tollways Corporation (MPTC), awarded the project to **Cebu Link Joint Venture (CLJV)** for the design and build of the entire bridge. CLJV is a consortium made up of Acciona Construcción SA (Spain), First Balfour, Incorporated (Philippines) and D.M. Consunji, Incorporated (Philippines). The total project cost is estimated to be more than 30 billion pesos or \$600M.

► 46



The CCLEX Bridge will have a total length of 5.3 miles (8.5 km) with two lanes in each direction.



EFCO SCOPE OF WORK

The project was divided into three areas: West Side (Cebu), East Side (Cordova) and Main Bridge.

EFCO and CLJV worked together from the pre-bid stage to develop suitable solutions for the Main Bridge (pile caps) and West Side (pile caps, columns and headstocks) for on and off ramp and viaducts structures.

THE MAIN BRIDGE

The Main Bridge team used a tieless **HAND-E-FORM®** system and **SUPER STUDS®** as strongback support with coil bolts anchored to bottom of the precast concrete slab to form the sides of the octagonal and rectangular shaped pile caps. With this tieless system, CLJV could save time and money by avoiding setting long form ties. They also used the **HAND-E-FORM** system to build their precast wall in their yard. The total pile cap for the Main Bridge is two sets of 35'-2" x 47'-2" x 8'-3" (10.7 m x 14.36 m x 2.5 m) and four sets of 32'-10" x 72'-3" x 11'-6" (10.0 m x 22.0 m x 3.5 m). EFCO supplied three sets of pile cap forms for the Main Bridge [one set 35'-2" x 47'-2" x 8'-3" (10.7 m x 14.36 m x 2.5 m) and two sets 32'-10" x 72'-3" x 11'-6" (10.0 m x 22.0 m x 3.5 m)]. EFCO's **HAND-E-FORM** panel is standard, leasable equipment with various sizes and shapes. It is a rigid panel with an alloy steel face sheet with accurate dimensions. It is designed for man-handling or gang forming solution to help speed job progress. It was ideal in this application.

WEST SIDE

Meanwhile, the West Side team was working on an offshore location (on water). EFCO designed friction collars attached to the steel caissons with **POWER TOWER** Overhead Beams, **SUPER STUDS®** and **E-BEAMS®** to support the pile caps for both on and off ramp and viaduct structures. The on and off ramp had a total of 31 pile caps to pour, typically sized at 25'-4" x 24'-4" x 6'-7"



For the headstocks, EFCO supplied six sets of column mounted aerial forms.

(7.7 m x 7.7 m x 2.0 m). EFCO supplied six sets of forms for these. EFCO supplied two sets of forms for the 10 viaduct pile caps, each 28'-7" x 64'-8" x 8'-3" (8.7 m x 19.7 m x 2.5 m) in size.

EFCO **PLATE GIRDER®** is standard, leasable equipment being used to form columns and headstocks easily and quickly while providing great concrete finish results. The crew achieved an average of 32 ft² (2.97 m²)/man-hour for fabrication, installation, stripping and cycling of formwork using EFCO **PLATE GIRDER**. The total number of columns to be poured were 80 [60 for on and off ramps, 5' x 5' x 19'-8" (1.5 m x 1.5 m x 6 m) and up to 46' (14 m) in height and 20 for viaduct, 9'-3" x 9'-3" x 19'-8" (2.8 m x 2.8 m x 6 m) and up to 118'-2" (36 m) in height]. EFCO supplied a total of 13 sets of forms, 15'-9" (4.8 m) high for viaduct columns, which were done in up to seven lifts.

For the headstocks, EFCO supplied six sets of column mounted aerial forms; four sets at 11'-2" x 46'-11" x 6'-7" (3.4 m x 14.3 x 2 m) and two sets at 11'-2" x 74'-2" x 8'-3" (3.4 m x 22.6 m x 2.5 m). Total number of headstocks to be poured were 39; 29 for on and off ramp headstocks and 10 for viaduct headstocks.

The spanning capabilities of EFCO equipment and the close collaboration and expertise of EFCO's and CLJV's engineering teams was a winning formula to work on this project where traditional shoring was not an option due to the height being 131'-3" (40 m) above water.

The project is currently still on-going and the teams using EFCO products are very pleased with the performance and results.

The key to the success in this project has been the ability to assemble an international

team of highly seasoned CLJV and EFCO professionals, which pulled their expertise together to bring this impressive new icon in the Cebu landscape to reality.

EFCO looks forward to continuing to build successful partnerships in the Republic of Philippines and beyond. ♦

Pedro Martinez Project Director
Jose Gomez Construction Director
Benjamin Dublin..Project Manager West Team
Florent Mouly..Project Manager Main Bridge
Jesus Toimil Lopez Viaduct Manager
Miguel Antonio Alejandro West Team Manager
Joel Torio EFCO Sr. Territory Manager
Reneil JopiaEFCO Territory Manager
Francisco Islas EFCO Field Service
Regional Manager
Caryll Mendiola.....EFCO Field Supervisor
Caruso Pandes.....EFCO Engineer



FORMING TUNNELS

Pixley, California

JD Heiskell is investing in two large GSI bins for increased grain storage, and **Figueroa Concrete Construction** has been awarded the contract to construct the concrete walls, pits and tunnels that go underneath them. Each of these bins measures 52'-6" (16 m) diameter x 120' (36.6 m) tall.

PROJECT SCOPE

Phase 1 of construction is a concrete tunnel, running approximately 250' (75 m) long x 8' (2.4 m) tall with a 24" (600 mm) concrete deck above, leading into a 20' (6 m) deep pit and then to a 15' (4.6 m) tall transition tunnel. This transition tunnel leads to Phase 2; a concrete tunnel that will measure 120' (36.6 m) long x 10' (3 m) tall.

SYSTEMS USED

Figueroa Concrete Construction wanted a system that could cycle easily throughout their required pour sequence and strip with ease. The decision to use **EFCO LITE**® combined with **EFCO PLATE GIRDER**® was certainly the most advantageous solution, because the crew could easily gang and cycle the system for the multiple pours required at various heights. Plus, Figueroa is very familiar with this system and is managing

to quickly assemble the horizontal and vertical gangs. On the Phase 2 tunnel, there were several W30x90 (approx. 762 mm x 134 kg/m) beams. These could make shoring for the deck excruciating, but the **EFCO E-Z DECK**® system allowed for quick and easy individual shoring between beam heights ranging from 9' to 14' (2.7 m to 4.3 m).

Work between Figueroa Concrete Construction and EFCO has helped this project move quickly and efficiently, and they plan to complete it in late 2020. ♦

Matt BurdenProject Manager
Gerardo Solano....General Superintendent
Alan Johnson.....EFCO Territory Manager
Matt Bruce.....EFCO Field Supervisor
Jorge Gonzalez Ruiz EFCO Engineer



The decision to use EFCO LITE combined with EFCO PLATE GIRDER was certainly the most advantageous solution, because the crew could easily gang and cycle the system for the multiple pours required at various heights.



FORMWORK SPANS A CREEK

Hindman, Kentucky

WORKING OVER A CREEK

When Rising Sun Developing in Lexington, Kentucky was awarded the New Knott County Transit Center in Hindman, Kentucky they asked the EFCO team in Columbus to look at some unique challenges with forming approximately 1,828 LF (560 m) of 24" x 24" (600 mm x 600 mm) and 24" x 36" (600 mm x 900 mm) beams. The challenge was a creek that ran down the middle of the structure that required that 11 beams to span the 20' (6.1 m) wide creek. The EFCO solution was to set 5R **PLATE GIRDER**® panels on **E-Z DECK**® towers to clear the span of the creek at 26' (7.9 m) and then use E-Z DECK towers for support of the beams on either side of the creek.

A COMBINATION OF PLATE GIRDER AND E-Z DECK

EFCO furnished four sets of **PLATE GIRDER** beam support and approximately 390 LF (119 m) of **E-Z DECK** at 18'-6" (5.6 m) tall to form the beams on either side of the structure. Rising Sun Developing planned to make three pours with this equipment being cycled, with precast double T's following behind and being set on the previously poured beams. ♦

Shane Carpenter Project Manager
Nick Newsome Superintendent
Ric Klinedinst.. EFCO Sr. Territory Manager
Brian Jenne EFCO Field Supervisor
Dan Burns EFCO Engineer



The EFCO solution set **PLATE GIRDER** panels on **E-Z DECK** towers to clear the span of the creek.





CONFIGURING INTO LARGER GANGS FOR GREATER PRODUCTIVITY

Rayong, Thailand

LNG TERMINAL & PIPELINE

The Nong Fab LNG receiving terminal is proposed to be built at Baan Nong Fab in the Muang Rayong District of Thailand's Rayong Province. The liquefied natural gas (LNG) terminal is being developed by the PTT Public Company's subsidiary, PTT LNG Company, and located 3.1 miles (5 km) west of Map Ta Phut Port. It will possess a regasification capacity of 8.3 million tons (7.5 million tonnes) per annum (Mtpa) and a peak output capacity of 9.9 million tons (9 Mtpa). The new terminal is scheduled to commence operations by the second quarter of 2021. It will be the second LNG receiving terminal in Thailand, after the Map Ta Phut LNG terminal, when finished.

The CTCI Corporation and Saipem were awarded a \$925M engineering, procurement, construction and commissioning (EPCC) contract for the terminal. Saipem has selected **Italian-Thai Development PLC**. (ITD) as a contractor and they, in turn, have partnered with EFCO to supply formwork for a retaining wall and pipeline bridge structure.

RETAINING WALL

The construction of the retaining wall structure runs alongside the sea and measures 22'-10" (6.9 m) high x 2'-8" (0.80 m) wide and 1,970' (600 m) in total length. ITD chose the **E-BEAM®** and **SUPER STUD®** system to form this wall due to its strength and need for less ties per area. EFCO's E-BEAM and SUPER STUD system also can be configured into larger gangs, which

will help increase the productivity and accelerate the construction schedule at the jobsite, given 1,970' (600 m) of this retaining wall has to be poured.

To maximize the capacity of the system and meet the customer's requirement, EFCO designed each gang with a 17'-9" (5.4 m) length and 23' (7.00 m) height. The customer is assembling EFCO E-BEAM and SUPER STUD gangs at their fabrication yard and then moving each gang to the construction site. They then connect each gang together with the E-BEAM Aligner Plates, making the connection between each gang strong and rigid.

Then EFCO was asked to provide the solution for another upcoming structure...

HEADSTOCKS

The headstock beams, or commonly called "pier caps," are constructed in the middle of the sea to support the service road, which is 3.6 miles (5.74 km) long and will access the jetty structures. The typical headstock dimension is 63' (19.2 m) long x 6'-7" (2.0 m) wide and 5' (1.5 m) deep. The total number of headstocks to be cast is 255, so the contractor needed efficient, durable and rigid formwork that could be cycled repeatedly from pier to pier and could easily be configured into long gangs safely from a barge. Plus the formwork could not be too heavy so the barge-crane could lift them. EFCO proposed using the **EFCO LITE®** system, which met all the requirements; plus it offered built-



The typical headstock dimension is 63' (19.2 m) long x 6'-7" (2.0 m) wide and 5' (1.5 m) deep.

in scaffold bracket and post for the working platform, which are safety features needed in off-shore construction. EFCO's engineer also optimized the form ties, which needed only one wet tie and one dry tie at the top of forms. This helped make it faster to assemble and cycle. All these features and benefits made EFCO LITE® the obvious choice for ITD. With readily available equipment, EFCO can supply nine sets of the equipment to ITD in a short period of time.

REPEAT STRUCTURE, REPEAT ORDER, REPEAT SATISFACTION

ITD initially rented EFCO E-BEAM® AND SUPER STUD® system to form 132' (40 m) of wall. Due to its productivity and ease

of use, ITD ordered enough to complete 66' (20 m) of additional wall.

For the headstock structure, ITD initially purchased nine sets of EFCO LITE. After using EFCO LITE in the field, the features and benefits were validated. ITD was impressed by their performance and ordered another 12 sets of EFCO LITE. ♦

Ruangrit Sornnarai Project Director
Praditchai Summart Project Engineer
Suphap Satthatham Project Engineer
Veerayut Ponsetmatargul EFCO Territory Manager
Rakchat Nimpila EFCO Field Supervisor
Sta Maria, Ralph Owen EFCO Engineer



PHASE 4: 5 NEW BRIDGES, 6 BRIDGE REPLACEMENTS

Queens, New York

REPAIR OF THE KEW GARDENS INTERCHANGE

Four major roadways feed into the Kew Gardens Interchange: The Grand Central Parkway, the Van Wyck Expressway, the Jackie Robinson Parkway and the Union Turnpike. Typically, this interchange serves nearly 600,000 vehicles a day. Initially built in the 1930s and expanded in the 1960s, the roads in this interchange provide access to JFK and LaGuardia International Airports.

The repair work for this project was broken into phases to control the disruption in travel. **Halmar International** was awarded Phase 4 of the project in August 2018. Phase 4 is an aggressive 48-month design build project and will reduce congestion along 10 lane miles of highway, which include five newly constructed bridges and replacement of six existing bridges.

ENGINEERED SOLUTION

Halmar International chose EFCO to supply the footings, columns and pier caps. The footings are being formed with contractor owned equipment and supplemented with rental forms and accessories. The piers are being formed with EFCO **Round Column**® forms and the pier caps are being formed with **PLATE GIRDER**® forms. ♦

Pat Early..... Project Manager
Jim Tully Project Engineer
Martino Restilli General Superintendent
Scott Mercurio .EFCO Sr. Territory Manager
Dan Astarita EFCO Field Supervisor
Jacquelyn Ewald EFCO Engineer



EFCO's PLATE GIRDER forms swing open at the soffit for easy cycling.



AIRPORT GETS NEW PARKING GARAGE

Norfolk, Virginia

INCREASE IN LONG-TERM AND EMPLOYEE PARKING

Norfolk International Airport services 3.9 million passengers per year. The latest infrastructure project at the airport is an 848,000 ft² (78,780 m²) parking garage that will add 3,000 new parking spaces. It will be used for long-term and employee parking.

CUNNINGHAM PARKING GARAGE SYSTEM SUPPLIED

Hourigan, a Richmond, Virginia based construction company, was awarded the project in 2019. The cast-in-place concrete package was contracted to **Baker DC**. Most of the parking garage consists of main carrying beams and parking deck. Baker partnered with EFCO to provide formwork for the main carrying beams. EFCO supplied the **Cunningham Parking Garage®** forming system to speed up cycling times. The Cunningham beam tubs are supported on 22 kip (98 kN) frames which swing below the hinge beam and attach to the beam tubs for cycling. The frames are then lowered onto beam dollies and cycled to the next pour. The speed in cycling the formwork and fewer required workers made the Cunningham system the logical choice for Baker DC. ♦

Rexford Holmes..... Project Manager
Billy Russell..... Superintendent
Andrew McNulty Superintendent
Kevin Pyle EFCO Territory Manager
Rick Lynch..... EFCO Field Supervisor
Eric Skaug, PE EFCO Engineer



The CUNNINGHAM beam tubs are supported on 22 kip (98 kN) frames which swing below the hinge beam and attach to the beam tubs for cycling.



FAST AND EFFICIENT, USING ONLY ONE SYSTEM

Nashville, Tennessee

OFFICE TOWERS

The Asurion Headquarters Project was a two-tower project in which **Brasfield & Gorrie** self-performed the concrete on the south tower, while **Fly & Form** installed the vertical and flatwork on the north tower. Standing in the heart of the Gulch in downtown Nashville, this structure consists of six levels of parking garage, followed by an amenity level, which serves as the base for two office towers that are nine floors each.

BEAMS AND SLABS

Brasfield & Gorrie partnered with EFCO to supply **E-Z DECK®** equipment to form this beam and slab project. Due to the fast-paced schedule, EFCO supplied a full floor of equipment for the parking levels, approximately 75,000 ft² (6,970 m²). The ease of adding and removing E-Z DECK posts made transitioning from the parking garage to the amenity level, and then to the office floors, fast and efficient using the same system throughout the entire structure.

UNIQUE SHORING SOLUTION NEEDED

Once the parking levels were complete, the building broke off into two 35,000 ft² (3,250 m²) office towers and each had their own unique architectural design. These designs involved one tower incorporating a push and pull effect in the slab, while the other had its slab skewed left and right. These changes occurred at three floor intervals requiring unique shoring solutions to address the cantilevered situations. Between the two towers, over 56,300 yd³ (43,045 m³) of concrete was poured with a total area of just over 1.3 million ft² (120,775 m²). ♦

“

EFCO's E-Z DECK system was made for the slab and beam set up on this project. The engineering time and details provided by the EFCO staff made installation of the decks both easy and efficient. Our team easily outpaced the expected formwork durations bringing the project in ahead of schedule and on budget.

I was impressed by the level of detail provided by the EFCO engineering staff. They provided detailed and specific drawings that took the guess work out of what equipment would be required.

Jason Tuten
Project Manager

”

Jason Tuten Project Manager
Wes Hamilton Senior Superintendent
Patrick Murphy Superintendent
Will King Assistant Field Manager
Jay Sims Assistant Field Manager
Claudio Rodriguez Foreman
Luis Primero Foreman
Stetson Spicer Rodman
Anderson Kay EFCO Territory Manager
Mark McCarty ... EFCO Sr. Field Supervisor
Sean Diemer EFCO Engineer

Brasfield & Gorrie partnered with EFCO to supply E-Z DECK equipment to form this beam and slab project.





You Will Get A Quality Finish Time After Time

Chía, Cundinamarca, Colombia

The “El Humero” Road interchange is part of the new dual carriageway variant in the municipality of Chía. With this project, the ACCENORTE concessionaire responsible for the work will manage to decongest the accesses and exits to the city of Bogotá as part of the fourth-way road plan—4G generation. INDEG, as the contractor in charge of the construction of this interchange, chose EFCO to supply the formwork and shoring equipment for four box culverts, considering its extensive experience in this type of project that guaranteed safety and productivity during its execution.

THE BENEFITS OF HAND-E-FORM SYSTEM

The project required a formwork system for the walls that, in addition to being portable, would allow for an architectural quality finish. The **HAND-E-FORM**® system met the contractor's expectations in terms of finish and performance, due to its single face sheet joint and simple assembly mechanics. Another outstanding aspect was the reduction in costs, since the greater spacing between spreader ties considerably reduces the amount required. Plus, the **HAND-E-FORM** system saves on needed materials since it does not require the use of wood stiffbacks.

Another aspect of the project was to shore up the box slabs, which are 2'-8" (800 mm) thick at an average height of 23' (7 m) and a slope of 5.4 percent. The EFCO sales and engineering team designed an **E-Z DECK**® table system that, because of its load bearing capacity, enabled this

slab to be shored with less equipment. By assembling the tables lying on the ground and then setting them in place later, there was an increase in productivity and a reduced the amount of work performed up in the air. Additionally, to solve the challenge of the slab incline, EFCO used the E-Z DECK Swivel Heads with the E-Z DECK Jacks to handle the incline of the slab in both directions and avoid the use of wood wedges.

The project supervision in charge of safety was very satisfied due to the support of EFCO's Engineering Department and the field service. They have resolved all the concerns that have arisen during the assembly and cycling of the equipment. Due to this success story, the concessionaire decided to execute other project structures with EFCO. ♦

Eduardo García Project Director
Sergio Rodriguez..... Project Engineer
Michel Morris EFCO Territory Manager
Mario Gallo EFCO Field Supervisor
Erick Smith Delacruz EFCO Engineer

“

We chose EFCO as our formwork and shoring supplier because of their extensive experience in these types of projects. The accompaniment of the EFCO support team from the sale, the development of the engineering solution, the accompaniment of field service and to the return process, was excellent. They completely exceeded our expectations.

Eduardo García
Project Director

”



The simple cam-action EFCO Aligner Clamp makes it easy to place aligners on the HAND-E-FORM system.



CONSTRUCTION WITH LITTLE DISRUPTION TO TRAFFIC

Sri Petaling, Selangor Darul Ehsan, Malaysia

SUKE HIGHWAY

The SUNGAI BESI-ULU KELANG Elevated Expressway (SUKE) Highway is a 15.2 miles (24.4 km), three-lane, dual-highway running from Sri Petaling to Ulu Kelang, in Klang Valley, Selangor, Malaysia. It is being constructed as an effort to reduce traffic congestion.

EFCO has partnered with **Acre Works Sdn. Bhd.** on the Package CA1 section of the SUKE Project. The duration was estimated for one year, with a target completion of March 2021.

EFCO'S ANSWER

EFCO Malaysia is supplying six sets of **PLATE GIRDER®** forms for the construction of 12 pier caps.

PLATE GIRDER PANELS ARE EASY TO RECONFIGURE

EFCO's **PLATE GIRDER** system and its unique self-spanning characteristics have enabled the contractor to pour concrete for the portal beams without shoring and with little or no disruption to the existing traffic flow underneath. Additionally, the EFCO **PLATE GIRDER** system comes in modular lengths and widths that can easily be connected together, giving Acre Works the flexibility of changing the lengths for different sizes and requirements of these portal beams. ♦

Mr. Raman Project Manager
Ms. Diana Contract Manager
Mr. Rajan Project Superintendent
Darren Chow EFCO Territory Manager
Foo Ming Huang EFCO Field Supervisor
Stephen Koon EFCO Engineer



EFCO's PLATE GIRDER system and its unique self-spanning characteristics has enabled the contractor to pour concrete for the portal beams without shoring.

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THE POWER OF LEADING BY EXAMPLE



Over the years, SwapLoader distributor, TOWMASTER in Litchfield, Minnesota has held their *Education & Equipment Expo*, a bi-annual event that invites the city and county fleet managers, drivers and maintenance people to attend. This event showcases the products that TOWMASTER manufactures as well as the vendors' products that they market. TOWMASTER has had great success in selling SwapLoader hook lifts to their customers at events such as this.

A powerful tool that TOWMASTER has utilized is showcasing previous builds they have done for various municipalities at these events. This provides attendees the ability to see and touch what other municipalities are using in their fleets.

It is by this means that Scott Schultz, fleet superintendent with the City of Maplewood, Minnesota, was able to understand the value of SwapLoader in their fleet. He worked with Tim Erickson, manager at TOWMASTER, to

determine their needs and which SwapLoader hoist would be the best choice. Tim suggested Scott consider the SwapLoader SL-400 and a stainless dump with spreader and brine tanks. They purchased it, as well as a flatbed and three open top containers for debris clean-up for their new SwapLoader.

Scott stated, *"The advantage of being able to do many different jobs with one truck as opposed to having several trucks to do the same jobs was the true deciding factor in going with the SwapLoader hook lift."* He continued, *"The ease in operation makes it a simple system for the drivers to learn."* Scott really appreciates the slide-through body lock system which provides a secure attachment of the body to the hoist.

The power of leading by example continues to grow as one city sees what another city is using for success. Great job TOWMASTER at the *Education & Equipment Expo* and for showcasing SwapLoader!

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