



PRECAST TACKLES SUPER BOWL WALK

INDIANAPOLIS HAS A GAME PLAN FOR THE FEBRUARY 2012 SUPER BOWL XLVI.

BY SUE McCRAVEN

PROJECT PROFILE

Project Engineer: Crawford, Murphy & Tilly Inc., Indianapolis

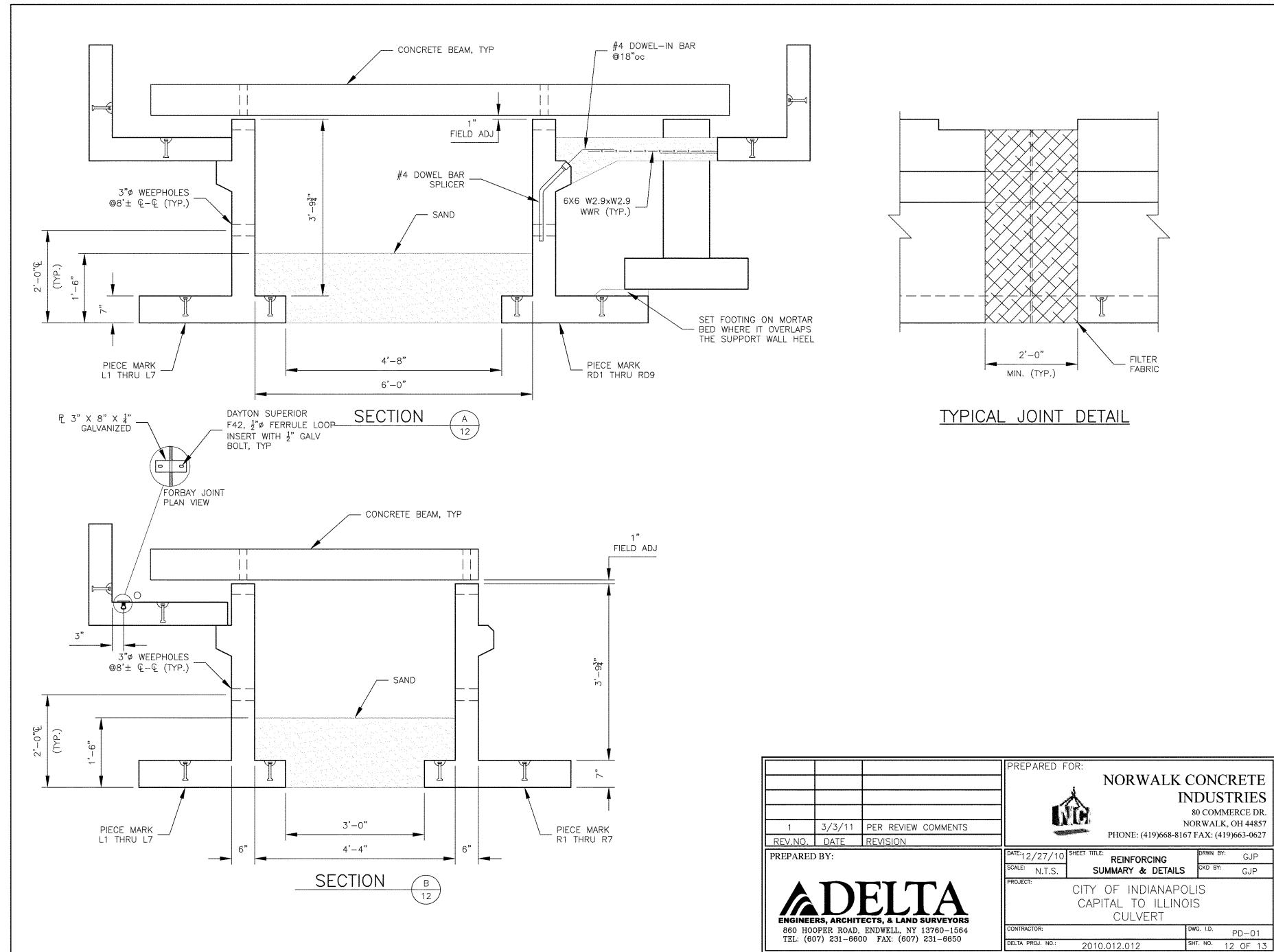
Precast Design Engineer: Delta Engineers, Architects & Land Surveyors, Endwell, N.Y.

Owner: City of Indianapolis, Department of Public Works

Project Contractor: Hunt Construction Group, Indianapolis

Precaster: Norwalk Concrete Industries, Norwalk, Ohio

Project Architect: RATIO Architects Inc., Indianapolis



When thousands of football fans invade downtown Indianapolis in February, they'll be doing their own version of the Super Bowl shuffle on a festive new three-block Pedestrian Promenade that will be a focal point of the revelry surrounding Lucas Oil Stadium, home of the Indianapolis Colts and site of the big game. While the party goes on above ground, one of the more unique aspects of the Georgia Street Improvements¹ will be buried underground – an innovative water-recycling stormwater sluiceway constructed from a series of custom-designed precast concrete elements.

¹ Official project name: A New Urban Outdoor Event Venue: Georgia Street Improvements, Indianapolis

How Precast Gained The Home-Field Advantage

In the initial design, the sluiceway was to be constructed with cast-in-place concrete (CIP) utility vaults and stormwater culverts. Only the load-bearing grade beams were specified as precast. All that changed when Bruce G. Carter, P.E., construction manager of Hunt Construction Group, contacted John Lendrum, president of Norwalk Concrete Industries (NCI), for a quote on the precast grade beams that supported wooden decking for the project.

The two men were scratching out design ideas in the field office when Lendrum suggested that the

three large CIP electrical vaults on the plans could be precast structures. When Carter asked, "Can you do this storm drainage in precast?" Lendrum was as quick as a quarterback reading the blitz. Not only could NCI supply the precast utility vaults, Lendrum proposed building the entire stormwater sluiceway in precast concrete with major advantages for the project contractor that involved a whole lot less digging.

Getting Out in Front of CIP Competition

Digging huge holes under busy city streets has caused more than one contractor headache. In major urban areas, a smaller, quicker excavation is always

SOMETIMES THE BEST DEFENSE IS A GOOD OFFENSE

BY RONALD E. THORNTON, P.E.

The Super Bowl Pedestrian Promenade project provides the perfect example of how the natural advantages of precast concrete can cause contractors to rethink traditional cast-in-place (CIP) designs.

The precast manufacturer came to Delta Engineers, Architects & Land Surveyors to discuss a precast concrete system for a stormwater sluiceway originally designed for CIP – from the walls down to the footing. Originally, the only precast pieces in the three-block long promenade were the grade beams. After meeting with John Lendrum of Norwalk Concrete Industries, the precaster for the project, Hunt Construction Group began to consider a CIP foundation with precast concrete trench walls, which required a problematic CIP-to-precast connection. I asked Lendrum: “Why do that when the entire drainage system could be designed in precast with its many advantages for the contractor and owner?”

Delta then worked up two concept drawings:

- U-shaped sections using continuous precast elements with openings in the bottom slab for drainage; and

- Segmental L-shaped walls about 4-ft-by-4-in. high on each side of the trench. The design included vaults 10 ft by 18 ft by 12 ft ID, cast in two pieces at 52,00 lb per half, with H20-rated aluminum hatches and a fiberglass-grated partial false floor for drainage.

The tops of the precast L-shaped walls had raised sections, or pedestal supports, similar in appearance to a scalloped top edge for the beam seating. The beam spacing varied along the length of the trench as designated on the contract plans.

The engineering challenge here was calculating the variable loads on the grade beams. Beam spacing had to accommodate both the existing underground utilities and architectural landscaping. In some locations, trees are integrated into the deck itself, so the width of the promenade trench supporting structure is not uniform, but changes as it progresses down its three-block length.

Another touchy project challenge, typical of most urban excavations, is that it is not possible to anticipate all pre-existing subsurface utilities, as with

a manhole that was not on the drawings. This manhole is located at one of the traffic crossovers and directly in line with the path of the drainage culvert. Delta designed a solution in which the existing manhole cover slab sits below the culvert roof slab with a 24-in.-diameter grade ring extending through the roof of the culvert. The existing culvert walls and base slab were saw-cut around the manhole.

The original 12-in.-thick CIP footing was reduced to 7 in., a considerable cost savings in concrete yardage and in on-site labor hours. City culverts, shown on the original plans, are located at each street intersection and were also converted from CIP to precast.

Rainwater will percolate through a 36-in.-thick sand layer in the bottom of the trench before reaching the drainage pipes. To ensure adequate plant root growth, a structural soil fill of 80% stone and 20% topsoil surrounds the precast components. Irrigation pumps in each of the three blocks reroute water to the surface plantings located along the Pedestrian Promenade.

While either CIP or precast concrete could meet the project’s drainage specifications, precast offers additional advantages:

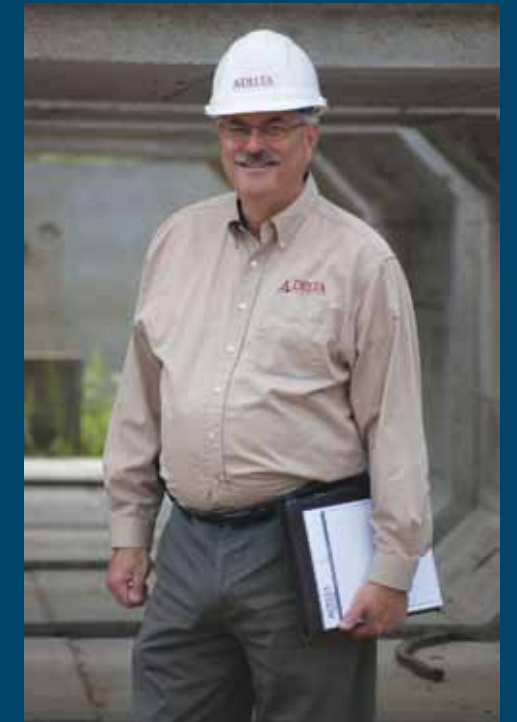
- Speed of installation/construction
- Higher manufactured product quality
- Greater on-site safety, because a rapidly installed

precast trench can be backfilled sooner, minimizing potential job-site safety hazards inherent with large excavations

- Minimal site disruption and more efficient use of labor and material (no job-site formwork, fewer laborers and ready-mix concrete truck deliveries)

By taking possession of better design and cost options, owners, precast producers, specifying engineers and architects can improve the odds of gaining additional work in today’s difficult economic climate.

Ronald E. Thornton, P.E., is a project manager with more than 25 years of experience in the design of precast concrete products.



Ronald E. Thornton, P.E.
Photo courtesy of Delta Engineers, Architects & Land Surveyors
(www.deltaengineers.com)

better, because work stoppages due to buried obstacles delay construction and lead to cost overruns. And the larger the hole, the greater the likelihood of running into problems.

The playing field under Georgia Street, in the heart of Indianapolis, proved no exception. A manhole at one of Indianapolis’ street intersections did not appear on the plans, and its obstruction required a redesign (see the sidebar “Sometimes the Best Defense is a Good Offense”).

So what precast had to offer – on-time delivery, rapid assembly, and less digging and site disruption than a CIP system – sounded good to Carter. The contractor also understood precast’s advantage above ground: minimizing unnecessary interference to street-front businesses.

“Hunt Construction Group is committed to minimizing any inconvenience or closure to the businesses along the Georgia Street,” explains Carter. “The overriding advantage of precast concrete over CIP is found in scheduling. Precast meant a smaller excavation, rapid assembly and minimal downtime for



Illustration courtesy of
RATIO Architects Inc.
(www.ratioarchitects.com)

0' 20' 40' 80'

WEST BLOCK PLAN



Illustration courtesy of
RATIO Architects Inc.
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precast, Thornton was now charged with engineering a precast solution for the entire stormwater collection system.

NCI staff contributed their ideas too. While many of the precast elements required custom casting, “our staff found the sluceway work challenging, fun and mind-expanding,” said Lendrum. New custom forms were built in-house and, once fabricated, were used for all the culvert pieces. In the planning stages for the Super Bowl Pedestrian Promenade project, “NCI production staff constantly suggested ways to make the project better,” said Lendrum, “and their enthusiasm made the project all the more exciting.”

Precasters often relish unusual assignments, because a challenge perks up the staff. Unique applications are more invigorating than just stamping out identical manholes. It’s a misconception, said Lendrum, that production staff is adversely affected by novel projects. It’s quite the opposite, in fact. By involving the precaster at the early planning stages, the contractor was able to take advantage of many decades of precasting experience at the production level that gave the project added value.

GREEN ADVANTAGE

Beneath the streets of Indianapolis’ new urban outdoor event venue, collected rainwater will be recycled to the surface with pumps, using the water to irrigate architectural landscaping. So rather than allowing rainfall to escape into city sewers, the project’s green advantage is that it conserves and recycles a valuable, natural resource, while at the same time, filters the runoff flowing into storm sewers.

Another interesting aspect of the Indianapolis project is the wooden boardwalk – not a common commodity in Midwest cities because of freeze-thaw conditions. Usually reserved for more temperate conditions, the wooden walkway and colorful architectural elements of the promenade will give a warm-weather feel to Super Bowl week partying in downtown Indy. It may not be South Beach, but the Super Bowl Pedestrian Promenade will help turn a cool-climate city into a hot destination for frenzied football fans this February. **ps**

Sue McCraven, NPCA technical consultant and Precast Solutions editor, is a civil and environmental engineer.



John Lendrum, president
of Norwalk Concrete
Industries (NCI)
NPCA file photo

all involved.” For Lendrum, the Georgia Street Project exemplifies one of the most important communication challenges for the precast industry: “to help designers who typically specify CIP to more fully understand the added value and construction savings that precast systems deliver.” Lendrum believes that proposing precast as an alternative to CIP design to customers, after the bid process, can be an effective way of gaining business that is a financial win for all parties.

PRECASTERS AND ENGINEERS ARE GAME CHANGERS

After presenting his precast proposal to Hunt Construction Group, Lendrum contacted Ron Thornton of Delta Engineers, Architects & Land Surveyors, a specialty precast engineering firm, asking for load calculations for a precast sluceway design. While the original plans specified only the grade beams to be



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