SCANNER

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Alameda Corridor: Visionary Design and Construction

HNTB brings design-build experience to mammoth 'trench' section.

by

George Hale, HNTB Project Manager, Irvine; Adrian Share, HNTB Director of Operations in Orlando, FL
Jim Anglin, Regional Manager in Orlando, FL.

More and more, ASHE members in both the design and construction professions, find themselves involved in "design-build" projects, either as the designer, contractor, or owner's representative. This delivery method is gaining popularity with many state DOT's and other major owners for several reasons:

- To save time and spend extra funds becoming available from TEA-21,
- Perceived reduction of claims and "finger-pointing" between contractor and designer, and
- Less burden on agency staffs that in most cases have larger workloads and less experience than 10 years ago, due to larger funding programs, early retirements, and downsizing.

While the ASHE organization has not yet spread to the West Coast, one of ASHE's largest member firms, HNTB, is involved in several large design-build projects that may provide some interesting real-life lessons on the advantages and disadvantages of the design-build delivery method.

One such project is the Alameda Corridor in the greater Los Angeles area. This project basically takes four separate rail corridors from the ports of Los Angeles and Long Beach that now have almost entirely at-grade crossings with the roadway system, and puts them in a consolidated 20-mile "trench" with the surface streets carried over the rail corridor on bridges.

It is one of the largest public infrastructure projects in the United States and the first consolidated rail link of its kind. When completed in 2002, the Alameda Corridor will provide safe and efficient rail access from the ports of Los Angeles and Long Beach to major transcontinental rail yards near downtown Los Angeles.

HNTB is part of a joint venture design-build team selected for the project's largest section – the Alameda Corridor Trench. The firm is responsible for project management and the engineering design of the trench and associated project components, including the trench structure, bridges, streets, storm drains and utility relocation. Other project team members include prime contractor Tutor-Saliba, O&G Construction, and Parsons Transportation Group. HNTB is serving as an equity participant in a design-build joint venture.

"The trench, which will be 30-feet deep by 51-feet wide, will stretch for 10 miles or half of the entire project," said George Hale, HNTB's project manager. "It's an incredible engineering feat that will significantly improve the movement of freight rail and vehicular traffic throughout the area."

The $712 million reinforced concrete trench with bridge overcrossings will allow freight rail traffic to operate without interfering or impacting street traffic. Extensive street improvements to expedite vehicular traffic to and from the ports are also an integral part of the project. Like every other project, the Alameda Corridor Trench is driven by three major factors - design, schedule, and cost. Hale said that HNTB's experience and that of the other team members allows them to integrate the strengths of each designer and contractor partner in the most efficient and appropriate way.

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National Board News

National board members met for a regular board meeting on October 2, 1999, at the Radisson Inn Bismarck, in Bismarck, North Dakota. National Director Charlie L. Flowe, P.E. presided over the meeting. The following are highlights of the committee reports and board actions:

Membership

Total ASHE membership has reached the 5,000 mark. This is an increase of 40 members since the last national board meeting in May. This year's total membership has increased by 132.

New Sections

Second Vice President Cooper Curtis and Director Tracy Hill recently met with representatives from Pierre, South Dakota and Fargo, North Dakota to discuss formation of two new ASHE sections. Both areas look promising. An organizational kickoff meeting is scheduled for October 26, 1999 in Tallahassee, Florida. Also, arrangements are being made for an organizational meeting in the Tidewater, Virginia area.

Public Relations

Director Shirley Stuttler will contact each section requesting updated information on section programs for updating the Operating Manual. Sections are encouraged to provide articles to their local newspapers noting meeting highlights, scholarship awards, special events, etc., to promote the society and to spark interest for membership.

National Conferences

Paul Zent reported that Conference 2000 would be held at the Radisson Inn, Bismarck, North Dakota on June 28th through July 1st. Teddy Roosevelt will make a special guest presentation along with the many exhibitors, technical sessions, field trips, family, spousal activities, and much more. Sponsor commitments are coming in, especially with the help of their web site.

First Vice President Domenic Piccolomini reported that committees are in place and planning is moving along to host Conference 2001 at Seven Springs Resort in Pennsylvania. Conference dates are June 28th through July 1st.

Director Shirley Stutter requested board approval to hold Conference 2002 from June 5th to June 9th. The Franklin Section is working with the Hospitality Network Services of Erie, Pennsylvania to plan the conference.

Director John McDowell reported that plans are under way to hold Conference 2003 at the Radisson Ponce De Leon Golf & Conference Resort in St. Augustine, Florida.

Directory/National Roster

First Vice President Dominic Piccolomini reported that copies of the new directory would be provided electronically to the president and secretary of each section via compact disc. Sections were given until November 30th to update their rosters. At the January Board meeting, CDs will be distributed to the respective national directors. ■

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"Sometimes a seemingly higher-cost alternative may be more appropriate if it will significantly reduce the schedule," he said. "Our team's experience enables us to thoroughly weigh the ramifications of cost versus schedule, resulting in the most effective design and construction solution from an overall perspective. Because HNTB has worked extensively with Tutor-Saliba on other design-build projects, the firm is able to tailor its design to Tutor's strengths as a contractor.

Some of the more technically interesting aspects and challenges of the project include:

- 200 existing at-grade railroad/highway crossings will be eliminated by the project,
- The Design-Build team must coordinate with 35 separate utility owners throughout the project,
- Dealing with 6 municipalities and Los Angeles County on the complex web of traffic maintenance during construction, utility protection and relocation, and major drainage issues, and
- The consolidated rail corridor will carry nearly 25% of the U.S. Pacific Rim cargo trade.

Project Status

The design-build team was given Notice-to-Proceed on this massive project in January 1999. As of November 1999, the project is well under way. Extensive utility relocation, temporary track work, and pile driving operations have been accomplished, heading towards project completion in 2002. This completion date will represent a timesaving of approximately three years when compared to the traditional design-bid-build project.

ASHE Readers are encouraged to stay tuned for a future article on the lessons learned from this complex undertaking.

"This project involves everything that you dream about when you begin your engineering career," Hale said. "It's a visionary, complex project that requires the best strategies in design and construction that our industry has to offer." ■

Greenhorne & O'Mara, Inc. to Conduct Archaeological and Historical Investigations for Fort Frederick State Park, Big Pool, Maryland

Fort Frederick State Park, in Big Pool, Maryland, is planning reconstruction of the historic fort wall and bastion interiors, a powder magazine, and the officers' quarters.

Greenhorne & O'Mara, Inc. (G&O) has been contracted to conduct archaeological and historical investigations to aid the park during its reconstruction efforts. The archaeological and historical investigations will attempt to uncover new information regarding the construction and appearance of the fort's interior curtain walls and bastions, with a focus on how the walls were defended; the appearance, construction, and location of the powder magazine; and the appearance and function of the officer's quarters.

This information is expected to provide an authoritative basis for the design and specifications for reconstruction work. The research will also aim to add to the general knowledge base of the design, construction, use, and appearance of Fort Frederick in the18th century.

Historical research for the project is currently underway and archaeological excavations will began September 21, 1999 and will continue into November. As part of the investigations, a volunteer program has been established which allows interested persons to participate in the field and laboratory work at the fort.

In addition, the archaeologists will be available on site to answer questions for visitors to the park. The workweek will be Tuesday through Saturday 8:00am to 4:30pm. Persons interested in volunteering should contact Varna G. Boyd at Greenhorne & O'Mara, Inc.at (301) 982-2854.

Established in 1950, G&O is a General Civil, Transportation, Environmental, and Geographic Sciences services firm headquartered in Greenbelt, Maryland. With 20 offices in Pennsylvania, Maryland, Virginia, West Virginia, North Carolina, Georgia, and Florida, G&O is committed to excellence in services, growth through teamwork, and success through Quality of Life(tm). ■

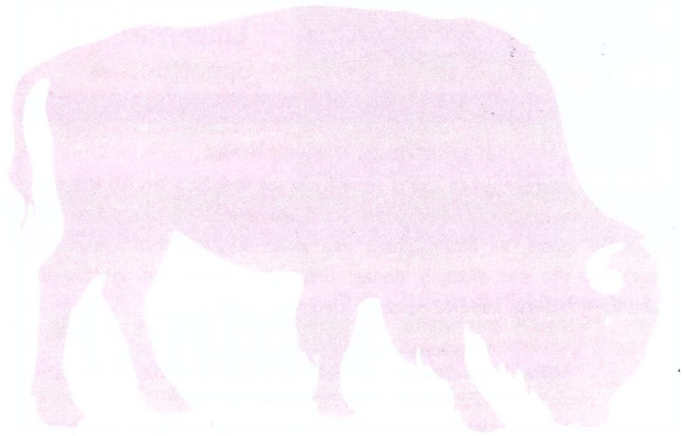
Dakota 2000 - ASHE National Conference June 28 to July 1, 2000 Bismarck, ND

The Central Dacotah Section is busy putting together a fun-filled and interesting conference for you and your families. You'll see Teddy Roosevelt giving the Keynote Address, a Pitch Fork Fondue at Fort Abraham Lincoln, the 7th Calvary will be in action, and many very interesting technical sessions will be held.

Now is the time to begin planning your family vacation. Take in the ASHE 2000 Conference and experience the beauty that North Dakota has to offer. Set aside June 28 through July 1, 2000 to enjoy the Missouri River, Lewis & Clark Trail, and the spectacular sunsets of the western prairie.

Northwest Airlines will get you there for less! Northwest Airlines, the preferred/official airline for the ASHE 2000 Conference is pleased to offer discounted airfares. To take advantage of these savings, please call Northwest World Meeting and Incentives reservations at 1-800-328-1111 between 7:30 a.m. and 7:30 p.m., Central Time, Monday through Friday. Please refer to WorldFile "NYD78" to receive this discount. ■

Link to the ASHE 2000 Conference Website at http:www.highwayengineers.org



Disaster Management and Transportation

by
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Natural and man-made disasters can affect transportation systems greatly. During disasters, people use roads and highways to escape from harm. Transportation engineers must plan for the unexpected to ensure maximum protection for the public.

Potential natural disasters include severe winter storms, droughts, earthquakes, floods, hurricanes, tropical storms, landslides, tornadoes, tsunamis, volcanoes, dam failures, wildfires, and meteor showers. Some of these natural hazards can occur with little to no warning, at any point in time. They have the capability of closing down all modes of transportation in different ways.

Some hazards create blackouts, which inhibit the use of roadways because signals will not function,and there will be a significant decrease in visibility (at night) due to a lack of lighting. Earthquakes, tornadoes, and meteors can physically damage roads. It is not safe to travel during any of these events, which is a problem because it is inevitable that people will be using a roadway when a disaster occurs. This creates panic and chaos, and prevents others from using the roadways.

Cities could also be exposed to such man-made disasters as nuclear power plant accidents, hazardous material incidents (transportation and fixed facility), power failure, nuclear attack, biological attack, terrorism, civil disorder, and transportation accidents (auto, air, rail, pipeline). Many of the man-made disasters require immediate evacuation of the public, which can create significant transportation problems.

Evacuation plans are developed to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies, and to establish a recovery system in order to return the affected area to its normal state. The four phases of disaster management include mitigation, preparedness, response, and recovery.

Mitigation is a process, which attempts to eliminate or reduce the probability of a disaster occurring. It also includes long-term processes that lessen the effects of unavoidable disasters. Preparedness assures the response capabilities during an emergency, i.e. planning, training, and exercises. Response involves providing emergency services during a crisis. These actions help reduce casualties and damage by warning, evacuation, and rescue. The last step is recovery, which is both a short and long-term process. First,vital services to the community must be restored, and the basic needs of the community should be met. Long-term recovery efforts include rebuilding structures and restoring non-vital services.

Evacuation of populated areas does not occur frequently. However, poor evacuation plans can severely jeopardize the traffic network and increase both the evacuatiion time and coonsequently the losses. Therefore, governmental authorities must have an effective evacuation plan that covers several possible scenarios. Transportation (disaster) planning differs from other types because it incorporates the probability of events occurring in multiple ways.

Many traditional evacuation plans do not incorporate changes in the population during the day. Evacuation plans become ineffective when population estimations for affected zones are off. It is necessary, but not always possible, to have a close and timely interaction between the transportation system and the surrounding community.

There will always be problems with transportation systems in the event of a disaster, due to the high amount of volume involved in the situation. These problems can be lessened with the use of a well-constructed, well-designed evacuation plan. The government must work with the community to prepare and alert the public in these situations. With the increase in technology, this cooperation between government and community will be made easier in the future. ■

Spanning the Neuse

by
Stuart Matthis, PE, RWA
Wayne Jones, Traylor Brothers

On November 5, 1999, North Carolina Governor James B. Hunt cut the ribbon and "officially" opened traffic onto North Carolina's largest single-contract highway project to date, the US 17/NC 55 crossing of the Trent and Neuse Rivers. The $120,000,000 project (see exhibit A), a major component of the governor's "2005 plan" for highway enhancements state-wide, provided a complex yet highly functional bypass of the historic town of New Bern, NC. In doing so, the work was accomplished with special consideration to numerous environmental, social, and historic issues posed by the community. But it did not come without controversy.

Need for the project became apparent in the early 1980's. The existing Neuse River crossing, a narrow 2-lane, mile-long trestle bridge with a swing span at the main channel, was comprised of steel beams and timber pile bents. The bridge was in serious disrepair and in constant need of annual maintenance/rehabilitation. To cross the river, US 17 traffic (quite heavy during the tourist season) not only had to cross the bridge, and occasionally wait for swing span openings, but also had to travel through downtown New Bern and contend with numerous traffic signals.

Planning

The North Carolina Department of Transportation (NC DOT) undertook the task of developing an environmental document for the project in the late 80's. From the outset, identification of potential routes for the crossing was a controversial ordeal. The existing route carried US 17 through downtown New Bern, once the capitol of North Carolina and one of the oldest cities in the state. Given the very historic nature of the community, bypass options became obvious front-runners, only to encounter substantial environmental problems (wetlands, submerged aquatic vegetation, historic properties, etc.). Eventually, four alignments were developed, and in the early 90's, an eastern route was identified by NCDOT, the FHWA, and HNTB (the DOT's consultant) as the preferred alternate.

The "eastern alignment", favored because of the lesser impacts on communities and land use, presented the need for a complex interchange on the west side of the Neuse River, one which lay partly over water. Additionally, the interchange alignment would run both beneath *and* over the top of an existing 4-lane highway (US 70) which carries heavy beach traffic. Funneling traffic onto and off of the 10,000 foot-long river crossing came at a considerable project expense, and placed a high emphasis on carefully planned traffic phasing.

Roadway and bridge conceptual layouts for the eastern alignment were finalized in 1992. In 1993, the DOT advertised for preliminary and final roadway/bridge design contracts. Following advertisement and proposal submittals, three (3) teams were shortlisted, with a team headed by Ralph Whitehead Associates (RWA) of Charlotte, NC selected in August 1993 to carry the Neuse River bridge project forward. Additionally, a separate contract for design of the Trent River crossing was awarded to American Engineers.

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Design

The RWA team (also composed of DS Atlantic, JMI Engineers, HNTB, Parsons Brinckerhoff, Barbara Mulkey Engineering, S&ME, and Nallamala-Hall-Wilson) began work on preliminary roadway plans and bridge type studies in the fall of 1993. Roadway plans consisted of fine-tuning alignments and profiles to provide desired traffic flow and acceptable clearances. Bridge type studies consisted of two concurrent evaluations:

Vessel Collision Analyses – Because both the Trent and Neuse Rivers carry barge traffic, the new bridges had to be designed to withstand vessel collision forces. These forces, coupled with the poor subsurface geology, made this aspect of the bridge type study a high priority, and decisions on span layouts were sensitive to the necessary foundations to absorb these vessel forces. RWA performed a risk/probablistic based vessel collision analysis, developing force diagrams for various locations across the river. The analyses showed that the main channel bents or piers at the 260' main span crossing would need to withstand static forces of over 2 million pounds. Away from the main channel, bents or piers were designed for forces representing an empty barge, broken away from its moorings and adrift on a hurricane storm surge.

Bridge Type Alternatives/Span Layouts – Four (4) superstructure types were selected for evaluation for the Neuse River bridges: (a) steel I-girders, (b) steel box girders, (c) concrete I-girders, both simple and continuous spans, and (d) cast-in-place concrete box girders. Extensive studies were conducted to optimize span layouts for each superstructure type, taking into account, on a weighted importance scale: initial estimated cost – 40%, ease of constructability – 20%, aesthetics – 20%, and long-term maintenance – 20%. The recommendation which came out of these studies was presented to and endorsed by NCDOT and FHWA, and carried forth into final design:

- continuous steel plate girders, both curved and straight, for all bridges except the trestle,
- continuous concrete I-girders for the trestle (given the close proximity to the brackish water),
- single-shaft hammerhead bents for the ramps and loops, supported by (a) piles on land and (b) drilled shafts over the water (where driving was impractical due to the poor capacity of the river mud, and the presence of hard marl beneath the mud), and
- multi-shaft hammerhead bents for the main bridge, supported by drilled shafts, with shaft sizes ranging from 762mm (30") to 1829mm (72").

In the summer of 1994, the RWA team and NCDOT negotiated scope/schedule/costs for final design of the 11 bridges contained within the Neuse River project limits. In order to assure discretionary funds, a letting date of September 1995 was established, meaning final review plans would need to be submitted by May 1995. The resulting 10-month schedule placed considerable pressure on both the RWA team and NCDOT to develop the designs and over 2,000 contract drawings for such complex bridge configurations. Some of the obstacles which were encountered:

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Aircraft Warning Lighting System- given the proximity of the project to the Craven County Regional Airport, a lighting system was necessary - the bridge would become the highest structure in the flight path of the main runway.

Impact Attenuators and Overhead Signs on Bridges - while not uncommon in major urban centers such as Los Angeles and New York, the inclusion of these items on bridge structures was somewhat unique in North Carolina. Addressing schemes for installing these items had to be developed.

Corps of Engineers Permitting - RWA and NCDOT chose to develop multiple methods of construction access for the bridge contractor, and submit each to the various permitting agencies for review/approval. While this complicated the permit process, it heightened the options for the contractor and avoided the need for extensive permit revisions following award of construction contract. The methods included (a) work bridges, (b) causeways, (c) barge mats, (d) barges afloat and/or skidded into position atop the muck. Dredging was deemed as unacceptable given the presence of heavy metals in the river mud.

Load Testing - NCDOT chose to perform design-phase load testing to augment the theoretical foundation design processes. A comprehensive load test was performed in early 1995 consisting of (a) an instrumented drilled shaft with an Osterberg load cell at the shaft tip, to measure skin friction, (b) a "stat-a-namic" load test to measure total bearing capacity, and (c) conventional and "stat-a-namic" lateral load tests. These tests, performed on two shaft sizes, were then used to correlate the theoretical projections, and additionally afforded lower safety factors as per AASHTO.

Hurricane Storm Surge Modeling - RWA retained the services of the Civil Analysis Group, Raleigh, NC, to perform 3-D finite element modeling of the Neuse River basin when under the influence of a major hurricane. This analysis was performed using the "DYNLET" program, and predicted water velocities and discharges at various locations. The results were utilized for bridge pier scour as well as vessel collision force determinations.

Construction

In May 1995, the RWA team submitted the last of the review plans for the 11 bridges, constituting a 2,088-sheet plan set. With final review in hand, the focus moved to advertise/bid activities. A pre-bid conference was held at the site in August 1995, and in September 1995, 9 bids were received. Contractors could submit on individual or all contracts, and the successful bidders were awarded contracts in November of 1995 as follows:

"A" contract (the Trent River bridge widening and 2 ramp bridges): TA Loving, Goldsboro, NC, for $13,100,000,

"B" contract (the Neuse River bridge relocation, including the west interchange and 8 ramp/loop bridges): Traylor Brothers, Evansville, IN, for $92,900,000, and

"C" contract (the Bridgeton approach, including a small interchange and one bridge): BEMCO, Lumberton, NC, for $13,300,000.

The "B" contract, by far the largest component of the work,

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WANTED

Walter P. Moore, a civil, structural, traffic, and parking engineering firm, seeks a Traffic CAD Production Manager to oversee two drafters and CAD production assignments, schedules, and profitability. Candidate must work with project managers to insure budgets and schedules are met and provide quality control over CAD production. This person must have five plus years AutoCAD experience with two of those in traffic/transportation drafting and progressive responsibilities.

All qualified candidates must be legally eligible to work in the US and be able to report for work within two weeks. Visit www.walterpmoore.com for company information.

WANTED

Walter P. Moore, a civil, structural, traffic, and parking engineering firm, seeks a Senior Traffic Engineer to lead the traffic/transportation group. The candidate must have a BSCE with MS in traffic preferred, a PE, or ability to receive Texas PE, minimum of three years of supervisory level experience, knowledge of design of closed loop signal systems, incident management and changeable messages. Also, minimum of eight years of progressive responsibility in traffic engineering, familiarity with metropolitan, and urban studies, congestion mitigation/air quality studies, transit studies, signal design, traffic impact studies, traffic control plans, and intersection capacity analysis. Computer knowledge would include HCS, Passer II, Passer III, Transyt-7f, Microstation, and MS Access.

All qualified candidates must be legally eligible to work in the US and be able to report for work within two weeks. Visit www.walterpmoore.com for company information.

WANTED

Robson Lapina is a multi-discipline forensic engineering firm practicing throughout the eastern and central US. We seek mature professionals, with excellent analytical and communication skills, for interesting and challenging jobs:

Civil/Construction: with structural, construction and OSHA safety experience. Part-time to start in Buffalo, Cincinnati, Cleveland, Detroit, and Indianapolis.

Civil/Highway: with experience in design, construction and maintenance phases of highway engineering. Part-time to start in Buffalo, Cleveland, Detroit, and Philadelphia; full-time position in Lancaster, PA.

More information on www.RobsonLapina.com. Resumes to Robson Lapina Inc., 350 New Holland Avenue, Lancaster, PA 17602, or email to mail@robsonlapina.com.

WANTED

Herbert, Rowland & Grubic, Inc. (HRG) is expanding its transportation engineering division in State College. HRG is a full-service consulting firm that has provided engineering for state agencies, municipalities, and the private sector for over 35 years. Immediate consideration for the transportation engineer position will be given to qualified individuals. Candidates should have a B.S.C.E., E.I.T. Certification and three to five years of experience in the following areas: highway construction plans, highway occupancy permits, highway drainage design, pavement design, right-of-way plans, and maintenance and protection of traffic. Effective written and verbal communication skills are also required. Please send resume and letter of interest to: Herbert, Rowland & Grubic, Inc., 120 Regent Court, State College, PA 16801, www.hrg-inc.com

WANTED

CECO Associates, Inc., Consulting Engineers, is a growing multi-disciplined consulting engineering firm practicing primarily throughout eastern and central Pennsylvania. Positions require B.S.C.E. with three to five years of experience in transportation design projects. PennDOT experience is a must and current P.E. licensing in Pennsylvania is preferred. Applicants should also have strong computer/Autocad capabilities. Please mail, fax, or email your resume with salary requirements to:

CECO Associates, Inc.
P.O. Box 995
Scranton, PA 18501
Fax: 570-342-3940
info@cecoengineers.com

WANTED

Walter P. Moore, a civil, structural, traffic, and parking engineering firm, seeks a Senior Traffic Project Manager with a minimum of six years experience, preferably some experience in Houston, including general traffic engineering in the design of traffic control systems, especially computerized traffic signal and communications systems. Candidate must be willing to design as well as manage others on projects, and will be responsible for design, production, project management, and project administration. Minimum BSCE is required with MS in traffic preferred. Must be a licensed professional engineer in Texas or ability to become licensed in Texas. Computer knowledge would include HCS, Passer II, Passer III, Transyt-7f, Microstation, and MS Access.

All qualified candidates must be legally eligible to work in the US and be able to report for work within two weeks. Visit www.walterpmoore.com for company information.

WANTED

Bridge department head - P.E. with 10 years minimum experience to supervise PDT projects. Salary to $90k/year.

E.O.E. M/F/V/H
Lehman Engineers
P.O. Box 419
Hollidaysburg, PA 16648
www.lehmanengineers.com

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began in earnest in early 1996. At the peak of productivity, Traylor Brothers employed over 250 personnel (plus 100 additional subcontractor personnel) and was operating construction equipment valued at $150,000,000. Cranes have dotted the New Bern "skyline" since the outset: the 260' main channel span girder placements, for example, utilized the combined efforts of two 200-ton cranes, one 350-ton "ringer" crane, and one 100-ton assist crane, all barge mounted and all in tandem. Other construction highlights:

Foundations and Substructures - Bridge foundation work consisted of driving over 1,000 piles and installing over 800 drilled shafts, utilizing steel casing and bentonite slurry for excavation support. NCDOT's quality assurance program required the use of underwater cameras and drilled pilot holes to verify that the rock sidewalls and tips were stable and non-degrading. The production drilled shafts averaged 30 meters (100') in length, 8 meters of which was rock-socketed. A staggered schedule for footing/column/cap construction followed, resulting in the completion of all bridge bents or piers (with the exception of the trestle) by summer of 1998.

Superstructures - Traylor Brothers retained Pittsburgh-Des Moines Steel (PDM) to fabricate the 629 steel girders and over 2,000 diaphragms/cross-frames, for which fit-up was a potential concern in light of the complex geometry. Steel erection began in late 1996 and was complete in early 1999, with no significant incidents or fit-up problems. Deck slab construction dominated the work effort beginning in 1998 through the completion of the last deck pour in June of 1999.

Traylor Brothers also chose to exercise a value engineering proposal (VEP) clause in the contract for redesign of the mile-long low-level trestle. The VEP requested a change from AASHTO type V girders to modified AASHTO type VI girders (1981mm or 78" deep), with the elimination of one girder line. RWA and Finley-McNary Engineers worked together on the VEP redesign, and the change was approved by NCDOT in 1997.

To make matters even more interesting, the New Bern area was battered by 5 hurricanes during construction (Bertha, Bonnie, Fran, Dennis, and Floyd), the latter of which passed directly over the site on September 16, 1999, the day before the scheduled ribbon-cutting. Nonetheless, each of the three contracts was completed almost 3 months prior to the contract completion date. The final statistics set numerous records in the state:

over 49 million pounds of steel,
200,000 cubic yards of reinforced concrete,
221,000 feet (40 miles) of pilings or drilled shaft/piers,
8 miles of bridge railing, and
40,000 linear feet of AASHTO precast girders.

With the project operational, bypass traffic is now able to avoid downtown New Bern, and the high-level river crossing enables vehicles and waterborne traffic to pass one another unimpeded. ■

Stark/Summit I-77 Widening Project

by

W. Brian Hughes, P.E. and John McCoy, MS Consultants, Inc.

With the goal of increasing capacity and safety on one of Ohio's busiest thoroughfares, MS Consultants, Inc. is designing a road for travel in the new millennium.

STA/SUM-77 is a $70 million improvement project on a 9.85 mile section of I-77, just north of Canton, Ohio. This segment of I-77, entailing the southern portion of the Akron-to-Canton corridor of this major north-south interstate route between Cleveland, Ohio, and Columbia, South Carolina, experiences a high volume of traffic, averaging more than 37,000 vehicles in each direction daily. It also bears a high volume of heavy vehicle usage, with 11% truck traffic.

The design plan sought by the Ohio Department of Transportation is multifaceted, including:

- widening the highway to include a full third lane in each direction,
- replacing all existing pavement with full-depth pavement,
- redesigning and rebuilding or replacing a combination of 15 mainline and overhead brides,
- significant changes to the highway's vertical profile to accomplish preferred vertical clearances on all bridges where practical, and
- the rebuilding/realignment of 17 on/off ramps.

To best serve motorists throughout the 8-10 year design/construction timeframe, traffic maintenance plans are being developed to sustain two lanes of traffic in each direction and to dovetail with another consultant's traffic plan for the segment south of MS Consultant's project.

The overall project will be divided into four phases, with construction following design in one phase at a time.

Widening the highway within the existing right-of-way will involve moving a segment of its alignment toward the middle, allowing two-lane traffic maintenance in each direction without disrupting current traffic patterns while new bridge and roadway construction occurs in the existing median.

Significant alterations to the vertical profile will occur to achieve conformance with current Federal and ODDOT safety and design standards, including the requirement of optimal vertical clearances of 15 feet at underpasses and 17 feet at overpasses.

Full depth pavement replacement of the existing roadway is planned using a flexible pavement section of 3-inch asphalt concrete, 10-inch bituminous aggregate base with a 4-inch layer of free draining base on a 6-inch aggregate.

The 17 on/off ramps in the project area will require significant redesign to accommodate the new vertical profile and course.

Bridge work will entail widening five structures to include a third lane and the total replacement, including raising and lengthening of three mainline bridges. Bridge raising will achieve optimum clearances for roads passing beneath the mainline while lengthening will accommodate the anticipated future widening of those roads. One overpass bridge will require replacement of its steel superstructure, while four overpass bridges will get new decks. The latest in safety standards will be applied to all elements of structural and civil design. ■

Fort Washington Way

The City of Cincinnati
Parsons Brinckerhoff Ohio, Inc.

The Fort Washington Way was constructed in the early 1960s as a connector between routes converging on downtown Cincinnati. The corridor contains 25 bridges and connects with four major Ohio River crossings between Cincinnati and Northern Kentucky.

Prior to July 1998, this route served as a one-mile freeway interchanges between I-71-, I-75, I-471, US 50, and downtown streets. Originally designed to carry 90,000 vehicles per day, Fort Washington Way has far exceeded its capacity, carrying 150,000 vehicles per day. In 1995, the Ohio-Kentucky-Indiana Regional Council of Governments began a Major Investment Study to identify solutions for this congested corridor.

Studying, designing, bidding, and constructing this massive $146.9 million project could not have been achieved without some significant streamlining of typical project development processes.

After the parties came together to review the entire project scope and agree on an appropriate level of study and review requirements, they declared the Fort Washington Way reconstruction project to be a Level 4 Categorical Exclusion. The declaration allowed review agencies to tailor a program that met project schedule goals without sacrificing environmental considerations.

Before it had been originally constructed, the Fort Washington Way project area had been developed and redeveloped a number of times. The City of Cincinnati, the Ohio Department of Transportation, and the State Historic Preservation Office agreed to conduct all archaeological reviews concurrently with construction, avoiding shutdown of a major Interstate route, lowering costs, and expediting construction schedules. Such coordination gave rise to other complementary projects.

One such project is the construction of a new relief system for the combined sewer overflow (CSO) from the downtown area. The CSO carries sewage and rainwater flowing south from downtown, and the new relief system will enable the infrastructure to function effectively for decades, thereby reducing incidents of sewer overflows into the Ohio River.

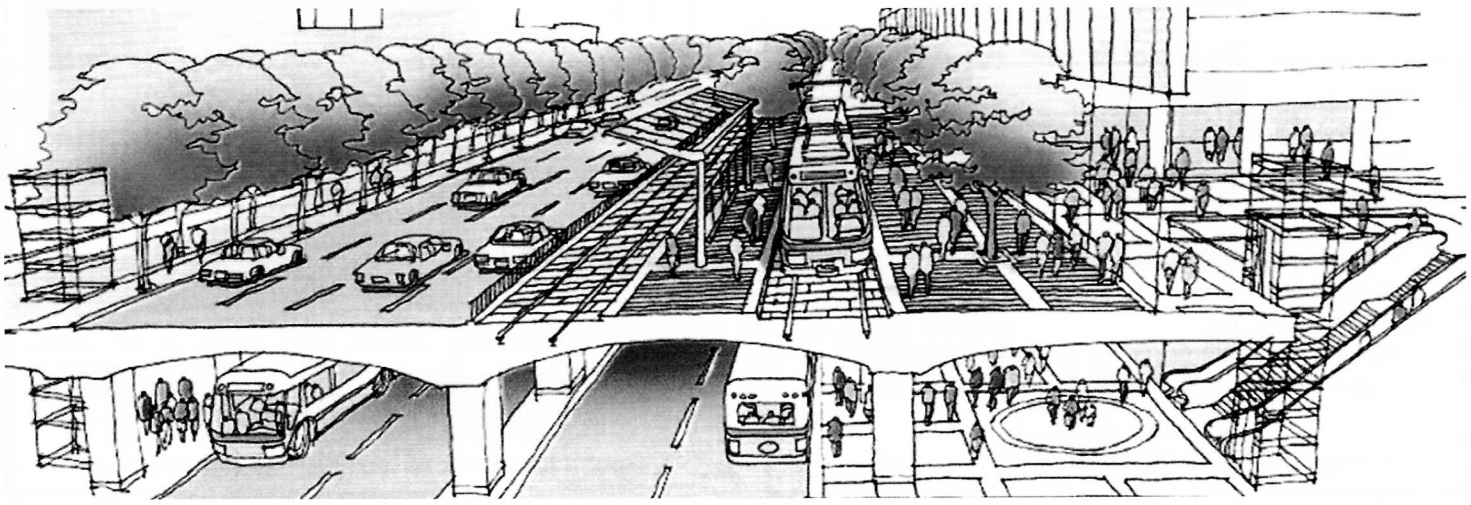
Another project is the collector-distributor corridor included in the Fort Washington Way system. The corridor is being designed as a structure to provide a new transportation corridor on the lower level. This lower level will immediately be used to stage transit and charter buses for river front events and future attractions. The lower level is also being designed to accommodate future uses, such as commuter rail transportation.

Unique urban design features on the Fort Washington Way project are another example of project innovation. Once completed, this corridor will be adorned with gateway type overpass bridges at either end. Fort Washington Way will also include specially designed lightposts, vandal fences, retaining walls, and other urban enhancements to add to the beauty of this system. Overpass bridges and collector routes will also include trees and plantings to make pedestrian trips across the Fort Washington Way trench friendlier.

The project also brought the public into the design and construction schedules through more than 350 presentations in the Cincinnati/Northern Kentucky region. The Fort Washington Way project built a web site to explain the reconstruction detours, maps, background information, project history, and updated construction photos. Using the web site has helped to reduce congestion and increase commuter awareness of current construction conditions.

Even the contracting community can use the web site to learn about the most recent contract notices, and advertising and bidding schedules. Contractors can publicly post questions and view responses before bidding.

The Fort Washington Way project development process is indicative of how cooperation, coordination, and communication can produce a superior project. Led by the spirit of regional cooperation, the project has brought officials from Ohio and Kentucky to work together. Once Fort Washington Way reconstruction has been completed, Cincinnati will have a safer and more efficient interstate corridor that will provide access to the region's front door. ■



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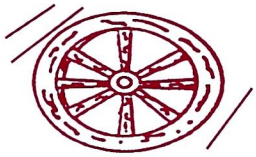

Greenhorne & O'Mara, Inc. (G&O) is pleased to announce that Richard R. Bennett has joined the staff of its newly opened Richmond office, as a Senior Project Manager for Transportation Services.

Mr. Bennett will direct highway projects involving utility relocations and right-of-way acquisitions handled by the company's Transportation Services Group in the Virginia area.

Mr. Bennett comes to G&O with more than 31 years experience in the management, design, and coordination of transportation projects.

He was previously employed by the Virginia Department of Transportation (VDOT) where he served as Assistant Director of VDOT's Right of Way and Utilities Division, administering the statewide right-of-way acquisition program for major areas of the state and the statewide utilities, information technology, and consultant programs.

Prior to being named Assistant Director, he served as VDOT's State Utilities Engineer, managing and directing VDOT's statewide utility program. For 11 years, he was involved in the preparation and review of utility relocation designs and specifications for inclusion in VDOT transportation projects.

Mr. Bennett has also served as a liaison with railroad companies coordinating transportation projects that impact railroad facilities, and was a project designer with VDOT's Location and Design Division serving in various positions for 10 years.

"Richard's career with VDOT was exemplary. His hands-on familiarity with transportation project design, utilities, and right-of-way coordination will enable G&O to provide more effective and efficient services to our Virginia clients," states Ben Burton, Office Manager for the Richmond G&O office.

Established in 1950, G&O is a general civil, transportation, environmental, and geographic sciences services firm headquartered in Greenbelt, Maryland. With 25 offices in Pennsylvania, Maryland, Virginia, West Virginia, North Carolina, Georgia, and Florida, G&O is committed to excellence in services, growth through teamwork, and success through Quality of Life (TM).

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