



Hardesty & Hanover

Request For Proposal (RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the



RARITAN RIVER DRAWBRIDGE

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Request For Proposal (RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the

RARITAN RIVER DRAWBRIDGE

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SECTION 1 Cover Letter









New Jersey Transit One Penn Plaza East Newark, NJ 07105-2246 Attn: Taishida S. Chapman

Re: **RFP No. 15-044 – Design, Engineering & Construction Assistance Services** for the Replacement of Raritan River Drawbridge

Dear Ms. Chapman,

The Hardesty & Hanover/Gannett Fleming Joint Venture is pleased to submit this proposal for the Design, Engineering and Construction Assistance Services for the Replacement of Raritan River Drawbridge. Our Team has been assembled to deliver the project goals of this contract by offering proven project management, the highest technical expertise in movable bridge and rail systems design, experience in navigating the environmental review process, and true constructability know-how. We are committed to meeting the project objectives and delivering this contract on schedule to meet the FTA grant requirements.

Our Joint Venture combines the resources and technical expertise of two nationally renowned firms, whose roots are planted in this region, have outstanding portfolios of rail/transit projects, and strong relationship with NJ TRANSIT. Established over 125 years ago, Hardesty & Hanover (H&H) is one of the most accomplished bridge firms nationwide, with a reputation of excellence and creativity. H&H's movable bridges are known for their longevity, reliability and being maintenance-friendly. Many have been in service for nearly a century, like the *NJ TRANSIT's Lower Hack* and *Amtrak's Dock Lift Bridge* in Newark. H&H is also known for pushing the technological boundaries, having designed some of the largest, state-of-the-art movable bridges in the world. Examples include the signature *Woodrow Wilson Memorial Bridge* over the Potomac River in Maryland and the *Jacques Chaban-Delmas Bridge* in France, which is the longest vertical lift bridge in Europe.

Gannett Fleming (GF) is one of the leading firms in global rail and transit industry, with extensive expertise in rail systems and some of the **best resources in catenary, traction power, signals/train control, telecommunications, security, and rail operations**. GF has a long-standing relationship with NJ Transit, having delivered critical projects, such as the *Portal Bridge* and the on-going *Superstorm Sandy Substation Hardening/Resiliency Program* at six locations including the Bay Head Rail Yard.

H&H and GF have a strong history working in tandem to deliver the engineering for award-winning railroad movable bridges. This includes Amtrak's *Niantic River Bridge* and MNR's *Peck Bridge*. H&H's lengthy portfolio of railroad movable bridges includes the recently completed *Port River Bridges* (2008) and the *Jacques Chaban-Delmas Bridge* (2013). Additionally, H&H has five other railroad movable bridges currently in final design or construction.

Recognizing that **construction staging, and, in particular, foundation work will be a major focus areas of this project**, our Team includes **Haley & Aldrich**, a leading geotechnical firm currently working on some of the largest bridge replacement projects in the region, including the *Goethals* and *Kosciuszko Bridge*. Bringing the contractor's insight to the design process, our Team also includes **Griffin Engineering**, a construction engineering firm, who has hands-on knowledge of the existing site conditions.

Our hand-picked key project staff bring the right mixture of experience, personal enthusiasm, and commitment to teamwork and partnership with NJ TRANSIT necessary for the project success. Our proposed **Project Manager**, **Visha Szumanski**, **PE**, who has served in high-level technical and management roles on complex rail/transit projects, such as the *Second Avenue Subway* and *Penn Station Redevelopment*, will be **100% dedicated** to the management of this project. She is well known to NJ TRANSIT having successfully delivered TOC contracts. She will be assisted by two Deputies: **Rich Cross**, **PE** (GF), who delivered the design for the *Portal Bridge* and **David Tuckman**, **PE** who is one of the leading design managers at H&H.

We believe that we have the right team to meet the challenges of this contract and we are excited about this opportunity to assist NJT in this major capital improvement project.

Very truly yours,

Paul Skelton, Principal (H&H) Hardesty & Hanover/Gannett Fleming JV July 16, 2015

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SECTION 2 Qualifications of Firms







SECTION 2: QUALIFICATIONS OF FIRMS

The Hardesty & Hanover/Gannett Fleming Joint Venture Team combines the resources of two firms who are the **industry front**runners in their respective focus areas for this project: Movable Bridges – Hardesty & Hanover; and Rail Systems – Gannett Fleming. The JV partners will be assisted by highly qualified specialty subconsultants, including many certified DBE firms.

HARDESTY & HANOVER

Established in 1887 and ranked in the top 15 in ENR's list of bridge engineering firms, Hardesty & Hanover is one of the **most seasoned, reputable, and accomplished bridge engineering firms** in the region. H&H's portfolio includes many landmark structures in the region over last 125 years. H&H offers a host of engineering services for **bridges, tunnels, rail/transit, highways and special structures**, including feasibility studies, structure design/rehabilitation, and mechanical/electrical services for movable bridges. Our multidiscipline staff of expert engineers and architects combine in-depth knowledge of the most current technologies with the firm's historical perspective to develop creative and efficient solutions, which can be successfully implemented in environmentally sensitive areas.

H&H is world renowned for expertise in **MOVABLE BRIDGES**. The firm designed the **first vertical lift bridge in the US**, the <u>Halsted Street Bridge</u> in Chicago, **built in 1894**, which had a lift height of 150ft. Since that day, H&H has been continuously pushing the technological limits of movable bridge engineering, designing record breaking structures, such as the <u>Tomlinson Lift Bridge</u>, CT, which is the **heaviest lift span in the Northeast**, and the <u>Chaban-Delmas Lift Bridge</u> in France, **featuring the longest lift span in Europe**.

RAIL & TRANSIT has always been at the center of H&H engineering practice. **The first railroad bridge designed by H&H was built 125 years ago** (*<u>Red Rock Bridge</u> over Colorado River*). To this day, H&H continues to be the leading expert in rail movable bridge and provide rail clients with innovative, efficient and dependable designs for structures carrying passengers and freight throughout the North America. **In the last ten years alone, H&H has delivered over 50 projects involving railroad structures** on the Northeast Corridor, for NJ TRANSIT, Amtrak, Metro-North, ConnDOT and MBTA. H&H's most recent **movable railroad bridge projects**, include:

- Niantic River Bridge, CT (2013) 140 ft. single leaf bascule on Amtrak's Northeast Corridor. Considered by Amtrak to be one of their most complex capital improvement projects and delivered jointly by H&H and GF.
- Port River Bascule Bridges, Australia (2008) two 200 ft. single leaf bascule bridges: railroad and highway. Pronounced a "brilliant structures" by the Chief Executive of the Australian Department of Transport and Infrastructure.
- Sarah Mildred Long Bridge, ME (in construction) 300 ft. two- level vertical lift bridge carrying railroad and highway. Features many innovative solutions, including fenderless piers and the first application of post tensioned concrete for the lift towers.
- Jacques Chaban-Delmas Bridge, Bordeaux, France (2013) 383 ft. vertical lift bridge, the longest in Europe, carries highway and two light rail tracks. Ultramodern look, state-of-the-art engineering, cutting-edge technology.
- BNSF Des Allemandes Swing Bridge, Louisiana (in construction) replacement of plate girder swing bridge carrying freight rail.
- Tomlinson Bridge, CT (2002) 270 ft. long highway/railway vertical lift and the Northeast's heaviest. Received many awards, including ABC Project of the Decade.
- CSX New River Bridge, FL (in construction) 105 ft. rolling lift bascule carrying freight rail.

H&H's Recent Movable RR Bridges



Niantic River Bridge, CT (2013) Northeast Corridor



Port River Bridges, Australia (2008) Freight Rail



Tomlinson Bridge (2002) Highway and Freight Rail



Jacques Chaban-Delmas, France (2013) Highway and Light Rail







Most of H&H's rail/transit structures are vital links on busy commuter lines, carrying hundreds of trains per day. H&H's rail/transit expertise and ingenuity allows us to implement complex rehabilitation and replacement schemes while maintaining uninterrupted service. Recent examples include Metro-North <u>Harlem River Lift Bridge</u> rope replacement, currently in construction, which has been done without interruption to the 750 trains crossing the bridge every day.

We understand the unique needs/priorities of the NJ TRANSIT and other railroad clients and the specific challenges of railroad environment. We are the leaders in the industry and actively participate in the development of railroad design standards throughout the country. H&H has pioneered engineering and technological innovations in prestigious industry organizations including AREMA and Heavy Movable Structures (HMS). Our Principal-in-Charge, Paul Skelton, is the former Chairman of AREMA Committee 15, and our Lead Mechanical Engineer, Stephen Mikucki, is the current Chairman of the Movable Bridge Subcommittee.

H&H is well familiar with NJ TRANSIT INFRASTRUCTURE. In the last two decades we have inspected and evaluated over 100 NJT bridges. H&H is also the original designer of four movable bridges on rail lines utilized by NJ TRANSIT:

- Lower Hack Vertical Lift Bridge (1928)
- Dock Vertical Lift Bridge (1935); operated by Amtrak
- Upper Hack Vertical Lift Bridge (1959)
- Delair Vertical Lift Bridge (1960); operated by Conrail

H&H has been also involved in various **rehabilitation contracts** for NJ TRANSIT movable bridges, including the rehabilitation of **Newark Drawbridge** (2010), which involved structural repairs, strengthening, and mechanical/electrical systems upgrade. H&H's other rehabilitation contracts included the mechanical and electrical systems upgrades for the **Dock Lift Bridge**, most recent completed in 2012.

H&H also implemented various inspection and rehabilitation contracts for the **Raritan River Bridge** project, starting with a replacement feasibility study (with vertical lift bridge) in 1980, followed by the first major rehabilitation in 1982 and various component repairs/upgrades since then. H&H knows this bridge and has a longstanding direct knowledge of this asset. H&H's other NJ TRANSIT movable bridge projects include the replacement of the **Beach Thorofare Swing** (1989) and the ongoing **feasibility study** for the replacement of 104-year old **Brielle Drawbridge**, which is a joint effort of H&H and GF.

Railroad movable bridges designed by H&H are **known for their longevity**, like the four bridges on NJ TRANSIT lines, as well as Conrail's <u>Calumet River Lift Bridge</u> in Chicago, built in 1912, which is still in service. The keys to our success with all our rail/transit clients has been utilizing:

- Innovative engineering approaches
- Effective engineering
- Attention to detail, and
- Stellar project management.

H&H has a deep understanding of the complex interactions between the different bridge systems (structural, mechanical and electrical) enabling the employment of a **holistic approach to the movable bridge design**. With creative use of materials, maintenance-centric design, and focus on operational reliability, **H&H designs bridges that endure**.



Lower Hack Lift – Built in 1928 NJT Morristown, Gladstone & NJ



Dock Vertical Lift Bridge – Built in 1935 NJT Northeast Corridor



Upper Hack Lift – Built in 1959 NJT Main Line



Delair Vertical Lift Bridge – Built in 1960 NJT Atlantic City Line





GANNETT FLEMING (GF)

For 100 years, Gannett Fleming has been a leader in global infrastructure solutions with a focus on planning, design, technology, and construction management services for a diverse array of markets. Across more than 65 offices, 2,000 highly qualified professionals are united in an unyielding commitment to deliver excellence to every client and every project, every day.

GF is a **leading infrastructure consultant in New Jersey**. The South Plainfield office is just minutes away from the project site and we have completed numerous major infrastructure projects in Middlesex County including <u>Route 18 Reconstruction</u> in New Brunswick (along the Raritan River) and the <u>Route 18 Extension</u> Projects in Piscataway. GF has three offices that provide a full array of engineering services, including rail and transit, highway and bridge design, transportation planning, environmental permitting and remediation, geotechnical engineering, dam and hydraulic structures, water and wastewater, electrical engineering, architecture and construction management.

Rail and Transit is one of GF's core specialty divisions. GF provides planning, design and management services, develop system plans and detailed designs. GF serves as a partner for program and construction management, testing/commissioning, as well as system expansion and upgrades for commuter railroads, freight railroads, and light and heavy rail transit systems.

Proud to be **ISO 9001 Certified**, GF is a leader in delivering **innovative solutions** for catenary, traction power, signaling and train control, communications, track, and rail operations. GF's professionals understand vendor systems and excel at integrating components into broad operational systems. GF is experienced in operations and maintenance procedures, construction materials and techniques, rehabilitation, testing, commissioning, and acceptance procedures. Drawing on experience working for railroads, transit authorities, and industry vendors, GF's staff of designers, engineers, and planners continuously adds new and vital technologies to solve practical problems in system design, installation, operations and maintenance.

With some of the best and brightest talent in the industry, GF also has extensive experience with the **design**, **rehabilitation and construction management of bridges** and highway structures. From small stream crossings to multi-level interchanges, GF staff's technical expertise allows us to develop the most efficient solutions. GF's bridge team has diverse experience, ranging from development of client-specific policies, guidelines, and procedures to final designs that incorporate innovative construction methods.

GF has a long-standing relationship with NJ TRANSIT, having delivered project such as the <u>Portal Bridge</u> and the on-going work on <u>Superstorm Sandy Substation</u> <u>Hardening/Resiliency Program</u> at six locations including the Bay Head Rail Yard. GF's other local railroad clients include Amtrak, LIRR, Metro-North, SEPTA, and the Delaware River Port Authority's PATCO Line. GF's culture of technical excellence, innovation, and responsiveness empowers us to fulfill our key mission: **make our** *clients successful*.



 NEC Capacity Improvements Portal Bridge Replacement, NJ



Emerging Transit Technologies SEPTA Positive Train Control, PA



 Protecting Infrastructure Amtrak's Security Improvements



Connecting People & Places Purple Line Light Rail, Baltimore



 Minimizing Public Impact NSR Bridge Replacement, PA





SUBCONSULTANTS

HALEY & ALDRICH is a cutting edge Geotechnical Consulting firm, which combines a thorough understanding of the soil and rock geology with superb geotechnical engineering expertise to solve complex site development and construction problems. Transportation engineering for highways, railroads, bridges, ports and terminals has always been a key part of H&A practice. As a member of the design and construction team, the firm brings true understanding of the subsurface conditions leading to sound and practical engineering solutions to help reduce the risk and the cost of construction. Haley & Aldrich mastered new and existing technologies, including practical applications of deep, high capacity foundations, slurry walls, tie-downs, controlled blasting, geosynthetics, lightweight fills, and ground improvement to address complex site construction schedules, and minimize impacts on existing structures. Haley & Aldrich has significant experience in the project area including the replacement of Route 35the Victory Bridge over the Raritan River which is immediately upstream of NJ TRANSIT'S movable bridge, a redevelopment study for the *Perth Amboy Landfill*, and the *Neptune Regional Transmission Project* which begins in Sayreville on the river and traverses through the Raritan River Bridge area with undersea transmission cables. The firm's other NJ coastal projects include the *Goethals Bridge*, *Shrewsbury River Bridge*, *Beesley's Point Bridge*, *Great Egg Harbor Bridge*, *Deeepwater Meteorological Tower off Atlantic City Shore*.

GRIFFIN ENGINEERING – specializes in **Construction Engineering/Constructability** services. Founded by Joe Griffin who spent 30 years in heavy construction industry, the firm brings the contractor's inside and hands-on knowledge about construction staging, heavy equipment, work sequencing/scheduling and cost. The firm's core services include design of temporary structures, constructability analysis, value engineering, estimating, scheduling and assistance with dispute resolution. Griffin Engineering will provide invaluable assistance to the project team in developing the most efficient solutions, staging of work to achieve a realistic construction schedule and reducing the project risks.

NAIK GROUP – certified DBE firm, which provides a broad range of Survey & Mapping services, including 3-D laser scanning, LiDAR, topographic and utility survey, right-of-way mapping, GPS survey, digital terrain modeling and photogrammetry. Utilizing state-of-the-art electronic equipment, NAIK's staff of highly experienced licensed surveyors and survey technicians are able to expedite any survey assignment and respond quickly to emergency requests. NAIK's services also include Civil, Utility & Structural engineering for bridge rehabilitation/replacement in environmentally complex areas. The firm's notable projects include <u>Hudson-Bergen Light Rail, Eastside Access, Second Avenue Subway</u> and <u>WTC Transportation Hub</u>.

JCMS – certified DBE firm with expertise in Cost Estimating & Scheduling for transportation projects. The firm has expert understanding of the bidding environment, union rules, equipment availability, material/labor costs, productivity rates, and the local history of environmental constraints and permitting. JCMS provided services for many NJ Transit projects, including the <u>Lower Hack</u> <u>Bridge, Mainline 2nd Track in Patterson</u>, <u>MMC Expansion</u>, and <u>Morris & Essex Station Improvements</u>.

ENVISION – certified DBE firm, Envision provides comprehensive Project Controls services including Document Control, Project Cost and Change Control, Risk Assessment and Value Engineering. Envision's team of seasoned professionals maximize the use of sophisticated management tools to seamlessly track progress and manage project records. The firm's recent notable projects include <u>NJ Transit Portal Bridge</u>, and planning study for <u>DRPA Southern NJ Mass Transit Alternatives</u>.

RADIN CONSULTANTS – **certified DBE firm** with expertise in **NEPA Review**, assisting local rail/transit clients, including NJT and MTA in meeting federal and state regulatory requirements and strategizing and streamlining opportunities to expedite project funding and implementation. RADIN's recent NJ TRANSIT projects include the <u>Portal Bridge</u>, <u>Perth Amboy Station Accessibility</u> <u>Improvements</u> and the <u>ARC Tunnel</u>.

SJH – certified DBE firm, specializing in engineering services for bridges, transit structures and highways, including Structural/Civil Design Support. SJH has been involved in many large scale transportation projects such as the NJT's <u>Portal Bridge Capacity</u> <u>Enhancement</u> and <u>post-Sandy Substation Hardening</u>, replacement of <u>Goethals</u> and <u>Kosciuszko</u> bridges and <u>Pulaski Skyway</u> <u>Rehabilitation</u>.

Our team also includes **ARCH**², a **DBE certified firm** well known to NJ TRANSIT, who will assist in coordination of historic preservation issues with the NEPA Consultant.

KEY PROJECT STAFF AND AVAILABILITY

It is through the combined efforts and skills of the people that projects are delivered, therefore, the quality and experience of the assigned personnel is crucial to achieving a success. For this project we carefully assembled a team that provides the right mix of professional experience, local knowledge, and technical expertise. The key project staff has been identified on the SECTION 7: Project Organization and Staffing Chart. All of these personnel are full-time employees of their respective firms and are available to serve on the project in the manner prescribed. They will not be removed from the team without written approval from NJ Transit. A summary of our key staff availability and their present and future project commitments are outlined in the Table below.

Name	Role	Current Project Commitments	Avail.
Visha Szumanski, PE (H&H)	Project Manager	Metro-North Mount Vernon Bridge Replacement	100%
Paul Skelton, PE (H&H)	Project Principal	 MassDOT Chelsea Street Vertical-Lift Bridge MassDOT Fore River Vertical-Lift Bridge 	25%
David Boaté, PE (GF)	Project Principal	 NJT A/E TOC NJT Rail Operations & Infrastructure Planning TOC 	25%
Richard Cross, PE (GF)	Deputy Project Manager – Track & Systems	 NJ Transit, HX Bridge Conceptual Report Metrolinx, GO Transit Electrification 	75%
David Tuckman, PE (H&H)	Deputy Project Manager – Structures	 Marine Parkway Bridge Maintenance Manuals NYCDOT City Island Temporary Bridge 	75%
Steven Harlacker, PE, SE (H&H)	Quality Assurance Manager	 ConnDOT Aetna Viaduct - Phase II ConnDOT Task Order Contract 	25%
Bruce Smith, PE (GF)	Quality Assurance Manager	 Southeastern Pennsylvania Transportation Authority, Staff Augmentation 	25%
Joe Griffin, PE (GE)	Constructability & Construction Staging	 NJTA Newark Bay Bridge Deck Reconstruction NJTA Seismic Retrofit of Routine Bridges 	25%
Glen Schetelich, PE (H&H)	Task Manager – Environmental	 Garden State Parkway Great Egg Harbor Bridge Pulaski Skyway Deck Replacement 	25%
Robert Matthews, PE (GF)	Task Manager – Civil	 NJDOT Route 4 Teaneck Road Bridge NJTA Various On-call Assignments 	75%
David Howell, PE (GF)	Task Manager – Rail Systems	 Amtrak, GEC Task Order Assignments AMT, Point St. Charles Maintenance Facility 	60%
Peter Roody, PE (H&H)	Task Manager – Movable Bridge	 MaineDOT Sarah Mildred Long CMGC MaineDOT Gut Bridge 	75%
David Gerber, PE (H&H)	Task Manager – Approach Spans	 PANYNJ Pulaski Skyway Redecking SRDC Grays Ferry Final Design 	50%
Raymond Mankbadi, PE (H&H)	Task Manager – Foundations & Geotech	 NYCDOT Unionport Bridge Replacement NYSDOT Harlem River Drive 	50%

PARTICIPATION OF DBE FIRMS

The H&H/GF JV understands the importance of equal opportunity for businesses of all sizes to participate in important transportation programs and is fully committed to meeting the project's DBE goals. We have assembled a team of the highest quality small businesses, with proven track record on NJ TRANSIT projects. Some these firms will lead specialty disciplines, such as survey, value engineering, scheduling/estimating. Others will provide support to the key project disciplines such as structural, civil, project controls. We are also planning to use a DBE firm for geotechnical borings, which is a very significant component of the project scope. An atmosphere of mentoring, training and partnering with DBE firms will be maintained through all the stages of the project. Our team will conduct monthly DBE coordination meetings to review staffing of various project tasks with DBE team members and will monitor their participation to assure full involvement.



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SECTION 3 Full-Time Office Certification











SECTION 3: FULL TIME OFFICE CERTIFICATION

The H&H/GF Joint Venture hereby certifies that we will maintain a full-time office throughout the entire project period, with adequate professional and support staff to carry out the work on this project. Visha Szumanski, our Project Manager, is currently reachable during regular working hours through H&H Headquarters office at 1501 Broadway in New York, New York, and can be contacted by phone at 212-944-1150. Upon start of the project, Ms. Szumanski and other key project staff will be based at our forthcoming **Joint Venture Project Office** located at 1037 Raymond Boulevard in Newark, NJ, **one block away from NJ TRANSIT headquarters**. The project office will be interconnected with all other H&H & GF offices via a wide area network, enabling us to readily draw on the resources of our regional offices, in particular H&H's nearby offices in **Hoboken** and **NYC**, and GF's offices in **Newark** and **Plainfield**. Maintaining a project office in close proximity to NJ TRANSIT will greatly facilitate communication with the client, allowing us to organize working sessions at a minutes notice.

OFFICE LOCATIONS

Firm	Location	Work Being Performed at Site	Proximity to Site
Joint Venture Office	1037 Raymond Boulevard Newark, NJ 07102	 Project Management/Quality Management Structural Design Rail Systems Design 	17 Miles
Hardesty & Hanover	1501 Broadway New York, NY 10036	 Movable Bridge Structural Design Movable Bridge Mechanical Design Movable Electrical Design Architectural Design 	23 Miles
	5 Marine View Plaza Hoboken, NJ 07030	 Permitting Support Foundations & Structural Design 	20 Miles
	850 Bear Tavern Road, Suite 206 West Trenton, NJ 08628	 Geotechnical Engineering Foundations & Structural Design 	32 Miles
Gannett Fleming	1037 Raymond Blvd #1420 Newark, NJ 07102	Permitting SupportRail Operations	17 Miles
	One Cragwood Road South Plainfield, NJ 07080	 Civil Engineering Hydraulics & Hydrology Structural Design 	9 Miles
	Valley Forge Corporate Center 1010 Adams Avenue Audubon, PA 19403-2402	 Rail System Design Track Design Scheduling 	66 Miles
Haley & Aldrich	299 Cherry Hill Road, Suite 303 Parsippany, New Jersey 07054	 Geotechnical Engineering Foundations Design 	26 Miles
Griffin Engineering	509 New York Boulevard Sea Girt, NJ 08750	 Constructability/Peer Review 	28 Miles
Arch2	495 Main Street 28 Metuchen, NJ 08840	Permit Support – Historic Preservation	5 Miles
Envision	3 Wheatley Boulevard, Unit 6B Mullica Hill, NJ 08062	Project ControlsValue Engineering	73 Miles
JCMS, Inc	1741 Whitehorse-Mercerville Rd Mercerville, NJ 08619	 Cost Estimating Construction Scheduling 	29 Miles
NAIK Consulting Group	200 Metroplex Dr # 403 Edison, NJ 08817	 Topo/Utility/ROW Survey Utilities Coordination 	7 Miles
Radin Consulting	193 West Hobart Gap Road Livingston, NJ 07039	NEPA Coordination	19 Miles
SJH Engineering	3700 NJ-27 #201 Princeton, NJ 08540	 Structural Engineering Support Civil Engineering Support 	17 Miles



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SECTION 4 Qualifications of Individuals



SECTION 4: OUALIFICATIONS OF INDIVIDUALS

The key to effectively addressing challenges on a project is in having a competent and dedicated management and technical personnel. We recognize the responsibility and opportunities presented by this contract and have hand-picked technical experts and leaders with the right mixture of technical expertise, personal enthusiasm, and commitment to teamwork and partnership with NJ TRANSIT that is necessary for success. Our management philosophy is that all project staff "work together as one," whether they are the members of the consultant's team or the owner's team. As seamlessly integrated members of the NJT Project Team, our staff will provide their expertise in design, problem solving, management and contract administration, augmenting the NJT staff and facilitating the actions necessary to execute the project. With years of experience working on rail and transit projects, we will provide efficient day to day management and the right technical expertise throughout the entire contract. Below is a brief introduction of some of our key staff members.

MANAGEMENT TEAM

Our PROJECT MANAGER, Visha Szumanski, PE (H&H), has 30 years of management and technical experience focused on rail and transit projects. She successfully delivered numerous bridge and station contracts to the key Northeast railroads, including NJ TRANSIT, NYC Transit, Amtrak, PANYNJ, Metro-North and WMATA. Ms. Szumanski's project portfolio includes recent NJ TRANSIT Task Order Contract involving the rehabilitation of the <u>Morgan Draw Bridge</u> in South Amboy and Navesink River Bridge in Red Bank, both of which are on North Jersey Coast Line. Her hands-on management style staying directly involved in resolving day-to-day issues and forecasting tomorrow's anticipated challenges, makes her a key differentiator to delivering a successful project. Ms. Szumanski being a seasoned, well respected expert managing large multi-disciplined projects brings her experience and lessons learned from these projects to implement wellorganized work plan and efficiently manage/value engineer the design team. Her management credentials include \$450 million reconstruction of the Triborough Bridge Toll Plaza, which involved a myriad of disciplines and was delivered on accelerated schedule with the final design completed in only nine months. Ms.



Ms. Szumanski assisted in resolving complex field problems on the Navesink River Bridge project.

Szumanski has a strong technical acumen, having served as the Chief Structural Engineer on high-profile projects, such as Second Avenue Subway and NY Penn Station Redevelopment, where she supervised the work of large design teams and was directly responsible for the overall technical content of deliverables. Her extensive rail/transit experience, technical expertise, and familiarity with the project area will facilitate developing efficient and creative engineering solutions.

Our Project Manager will be reporting to the **PRINCIPALS-IN-CHARGE**, Paul Skelton, PE (H&H), and David Boaté, PE (GF), who will not only provide highlevel project oversight, but also support the design team with their top-notch technical expertise. Paul Skelton, H&H's Principal-in-Charge, is a recognized expert in movable bridges, with more than 30 years of experience. He is actively involved in the industry research and development through his leadership of technical committees in many trade organizations, including **AREMA**. Similarly, David Boaté, GF's Principal-in-Charge, is a seasoned manager and hands-on engineer with extensive track/systems experience. He has extensive familiarity with the project area, having led the design of High-Level Platform Improvements on NJ Coast Line, which included extensive work on the approaches to the Perth Amboy and South Amboy Stations. Both of our Principals-in-Charge will be actively involved in the project, providing personal leadership and guidance to the team.



Mr. Skelton led the design of a signature Chaban-Delmas Lift Bridge in Bordeaux, France.

PROFILE OF A PROJECT MANAGER

VISHA SZUMANSKI, PE

Highlights

- Over 30 Years of Transportation Engineering Experience
- Experience with Railroad Movable Bridges
- Expertise in Managing Large Multidisciplinary Projects
- Strong NJ Transit Experience

Problem Solver:

- Combine patience, determination, and persistence to troubleshoot project issues
- Dynamic, results-oriented problem solver
- Easily understands and solves technical problems, she is the "subject matter expert"
- Identifies & Prioritizes challenges from Client, other Stakeholders and Project Task Leaders to achieve positive outcomes advancing the projects goals
- Skilled at evaluating options and generating solutions to unforeseen design/field issues to "stay on budget & schedule"
- Strong problem-solving and analytical skills
- Troubleshooting situations

Diversity Skills:

- Experienced in successful management of diverse groups of talented professionals Proven adaptability to differing professional expertise and engineering disciplines to get the project successfully
- delivered
- Ability to Communicate: talk and listen to conduct daily business to advance the project forward

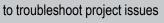
Teamwork/Team Player:

- Strong commitment to team environment with her ability to contribute expertise & support leadership of her **Design Task Managers**
- Thrive in a team environment and gets others to communicate & work well together.
- Her motto "Deliver Better, Working Together"

Accountable:

- Her clear notion of accountability and responsibility within the project management domain she owns
- throughout the project
- ✓ She underscores transparency & communication while holding accountability of herself & team in meeting deadlines and budgets
- She captures the appropriate relevant information, communicates it with the client and builds a strong project relationship built on trust and efficiency

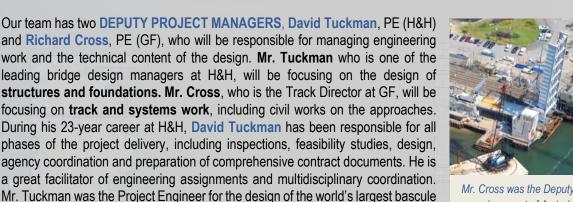




✓ She identifies risks, manages them & proactively leads the Design Team to overcoming the challenges

100% dedicated to this project





work and the technical content of the design. Mr. Tuckman who is one of the leading bridge design managers at H&H, will be focusing on the design of structures and foundations. Mr. Cross, who is the Track Director at GF, will be focusing on track and systems work, including civil works on the approaches. During his 23-year career at H&H, David Tuckman has been responsible for all phases of the project delivery, including inspections, feasibility studies, design, agency coordination and preparation of comprehensive contract documents. He is a great facilitator of engineering assignments and multidisciplinary coordination. Mr. Tuckman was the Project Engineer for the design of the world's largest bascule bridge, Woodrow Wilson Memorial Bridge and had a similar role on the Port River Bridge project in Australia. His other RR bridge projects include rehabilitation of



Mr. Cross was the Deputy Project Manager for the replacement of Amtrak's Niantic River Bridge

BNSF Panhandle Bridge in Chicago done under CREATE program and emergency repairs of the Saugus River Drawbridge in Boston, which carries MBTA commuter railroad. Richard Cross is the Track Director at Gannett Fleming with 38 years of experience in management and design of rail and transit systems, including 20 years with Conrail. During his career, Mr. Cross had a variety of project roles, including Technical Lead on Brielle Bridge feasibility study; Deputy PM on Amtrak's Niantic River Bridge (which was a joint effort of H&H and GF); and Quality Manager on the Eastside Access project. He also managed the Portal Bridge, which is one of the most complex capacity improvement projects on Northeast Corridor. His technical background and experience in track construction staging will guide our design team in developing design that minimizes impacts on rail operations.

Our QUALITY ASSURANCE MANAGERS will be Bruce Smith, PE (GF) and Steven Harlacker, PE, SE (H&H), who will be monitoring and auditing the compliance of the design process with the Project Quality Management Plan (QMP) and reporting the status directly to the Project Principals. Bruce Smith is the overall Quality Manager at GF's rail/transit division, responsible for implementing ISO 9001 certified quality management system. He was directly responsible for quality management on complex rail/transit projects such as the Purple Line Extension and the Portal Bridge Capacity Enhancements. Steven Harlacker is the Quality Control Director at H&H, responsible for project's conformance with the internal quality management system modeled on ISO 9001. Some of his recent notable projects include \$380M Kew Garden Interchange Improvements, NYSDOT Accelerated Bridge Program, and rehabilitation of Murray Morgan Vertical Lift Bridge in Tacoma, WA.

Our management team will be assisted by the Project Controls Group, which includes RISK MANAGER, Charlie Geer, PE (H&H), the former national Chairman of the ACEC Risk Management Committee, with 35 years of industry experience working in various roles related to managing risk in engineering and construction. Mr. Geer is an excellent facilitator of risk management workshops and author of many papers and industry guidelines. DOCUMENTS CONTROL MANAGER, Kurt Buettler (EC), has more than 30 years of experience in software-aided business process capture, document control, contract management, report generation, and web-based solutions. Mr. Buettler was the Document Control Manager on high profile projects such as Baltimore's Red Line and NJ TRANSIT Positive Train Control.

Recognizing the key role of constructability on this project, our team includes CONSTRUCTABILITY REVIEWERS, Steven Hom, PE (H&H), and Joe Griffin, PE (GE), who have extensive construction background. Steven Hom has over 30 years of both design and construction management experience, with hands-on knowledge of the construction methods and current industry practices. His notable projects include CSS for Niantic River Bridge and construction engineering for the erection of WTC Transportation Hub, which involved engineering support for all site logistics, access, temporary structures, underpinning and protection of the PATH service. Joe Griffin, who was the Director of Engineering at George Harms Construction, prior to starting his own consulting practice, supervised construction engineering on a wide range of heavy construction projects including railroads, highways, bridges, landfills, pipelines, and dams. Mr. Griffin has extensive



Mr. Hom provided Construction Engineering Services for WTC Transportation Hub.





familiarity with the project site, due to his direct involvement in the construction of the adjacent Victory Bridge. Lessons learned from that project, and, in particular, issues related to drilled shafts, noise/vibrations monitoring and sequencing of work around the seasonal restrictions will be of great assistance to our design team.

TASK MANAGERS

Delivering this complex project, which involves a myriad of technical disciplines, specialties and stakeholders, will require a particular focus on interdisciplinary coordination and collaboration. To organize this process we divided the anticipated project activities into six major focus areas or TASKS: Movable Span; Approach Spans; Rail Systems; Civil Engineering; Geotechnical/Foundations; and Approvals/Permitting. Each of these areas has been assigned a **Task Manager**, who will focus on facilitating technical work of his group and coordination with other teams.

MOVABLE SPAN DESIGN will be led by **Peter Roody**, PE (H&H), who is a movable bridge expert, known for his ingenuity in addressing complex technical problems. His projects feature many creative and time tested solutions which improve bridge performance, ensure dependable operations and minimize



Mr. Roody and Mr. Hawkins had key roles in the design of Sarah Long Lift Bridge.

maintenance requirements. Notable examples include Amtrak's <u>Niantic River Bridge</u> and <u>Port River Bridges</u> in Adelaide, Australia, featuring 200-foot long single-leaf bascule spans. Mr. Roody also led rehabilitation design for a 100-year old Conrail's <u>Calumet</u> <u>River Vertical Lift Bridge</u> in Chicago (originally designed by H&H) and is currently the lead designer for the replacement of the <u>Sarah</u> <u>Long Vertical Lift Bridge</u>, which uses many creative solutions, including fenderless piers designed to withstand vessel impact. He has also participated in NJ TRANSIT's feasibility study for <u>Brielle Bridge</u>. His technical acumen and "out of the box" thinking will aid the design team in developing efficient and practical solutions, with a focus on maintenance, reliability and longevity. Mr. Roody will will be assisted by STRUCTURAL LEAD, Michael Hawkins, PE (H&H), who recently delivered the design for \$160M <u>Sarah Long Vertical Lift Bridge</u>. Mr. Hawkins had leading roles on other significant RR movable bridge projects, including the replacement of the <u>Niantic River</u> and <u>PECK Bridges</u>, and feasibility studies for the <u>CONN River</u> and <u>WALK Bridges</u>. His is currently leading peer/constructability reviews for the WALK Bridge replacement design. The <u>MECHANICAL LEAD</u> will be provided by a movable bridge expert, <u>Steve Mikucki</u>, PE (H&H), who has been involved in the design of all significant bridges delivered by H&H in the past 25 years. His notable recent projects include the <u>Tomlinson Vertical Lift Bridge</u>, which has the heaviest lift span in the Northeast; the \$600 million <u>Willis Avenue Swing Bridge</u> and the signature <u>Woodrow Wilson Memorial Bridge</u>. Mr. Mikucki is a recognized industry leader, currently serving as the Chairman of Heavy Movable Structures and the AREMA Movable Bridge

APPROACH SPAN DESIGN will be led by David Gerber, PE (H&H), who had key roles in the design of the <u>Niantic River Bridge</u> and rehabilitation of NJ TRANSIT's <u>Newark Drawbridge</u>. Mr. Gerber worked on many major bridge reconstruction projects in New Jersey coastal areas and has extensive knowledge of the local, state and federal regulatory requirements, including permitting and

coordination with the Coast Guard. Most recently, he has been responsible for developing approach span alternatives for NJ TRANSIT's <u>Brielle Bridge Feasibility</u> <u>Study.</u>

In order to facilitate the support/coordination with the NEPA consultant, our team includes **ALTERNATIVE ANALYSIS** Task Force, which will be led by **Paul Connolly**, PE (H&H), who delivered the <u>Brielle Bridge Feasibility Study</u>. Mr. Connolly has excellent understanding of the constructability issues, having managed projects such as the counterweight rope replacement for <u>MNR Harlem River Lift Bridge</u>, which carries 750 trains per day and <u>Amtrak's Task Order Contract</u>. His recent Brielle experience will streamline the alternative development and evaluation process.



Mr. Gerber and Mr. Connolly had key roles in the Feasibility Study for NJT's Brielle Bridge





TRACK & RAIL SYSTEMS design will be led by David Howell, PE (GF), who has more than 40 years of track/systems experience. Mr. Howell had a key role on the <u>Portal Bridge</u>, were he managed the design on 2.5 miles of new track, signals, catenary and interlockings. His other notable projects include EIS for the replacement of <u>CONN River Bridge</u> and <u>Amtrak's GEC Contract</u>, which involved various improvements on NEC, including bridge replacement and mainline track improvements. **His extensive hands-on experience will expedite track/systems staging to minimize impact on NJ TRANSIT operations.**

Mr. Howell will be working closely with John Legath, PE (GF), who will lead TRACK DESIGN. Mr. Legath is an industry expert, who was on the staff of Conrail, before joining GF 20 years ago. He led track design on the <u>Portal Bridge</u> and the <u>Niantic River</u> <u>Bridge</u>. His other notable work includes the replacement of Amtrak's <u>Sawtooth Bridges</u> on NEC, spanning over four NJ TRANSIT mainline tracks, Conrail and the Port Authority Trans-Hudson line. Mr. Legath has unmatched expertise in track design and construction staging, assisted by his intimate familiarity with Conrail, NJT and Amtrak requirements.

CIVIL ENGINEERING will be led by **Robert Matthews**, PE (GF), who manages the Civil Engineering Department at GF. Mr. Matthews has supervised design and obtained environmental approvals for numerous projects that involved transit facilities, site development, complex utility relocation, storm drainage design/modifications, grading, roadway reconstruction, soil erosion and sediment control, traffic analysis and MPT. He has excellent knowledge of the state and federal regulatory requirements, including stormwater management and environmental permitting. His notable projects include <u>Garden State Parkway Widening</u>, <u>NJ Turnpike</u> Interchange 6 to 9 and Garden State Parkway and I-78 Interchange Improvements.

Recognizing that GEOTECHNICAL/FOUNDATION ENGINEERING will be one of the most challenging tasks on this project, we have assembled a team of topnotch industry experts with hands-on knowledge of the local conditions. This task will be led by Ray Mankbadi, PE (H&H) who was responsible for geotechnical/foundations work on projects such as the \$600 million <u>Willis Avenue</u> <u>Bridge</u> and \$350 million NJDOT <u>Route 52 Causeway</u>. Mr. Mankbadi led foundations design on many other bridge projects in NJ coastal areas, including the <u>Great Egg Harbor Bridge</u>, currently in construction, and most recently, was involved in <u>Brielle Bridge Feasibility Study</u>. Mr. Mankbadi will be assisted by Ed Zamiskie, PE, of Haley & Aldrich, who provided geotechnical services for the construction of the adjacent Route 35 Victory Bridge. Mr. Zamiskie had key roles on many local high profile projects, including <u>Goethals</u> and <u>Kosciuszko Bridge</u>, <u>Secaucus Junction Improvements</u> and <u>Marine Parkway Bridge Resiliency Study</u>. His experience in coastal construction, and, in particular, lessons learned from the Victory Bridge will be of great value to the foundation design effort.

Our geotechnical team also includes seismic expert, Prof. Mishac Yegian, PhD, and the former FHWA Engineer of the Year, Jerry DiMaggio, PE. Mr. Yegian collaborated with H&H on many bridge projects, including the <u>RFK Harlem River</u> <u>Drive Bridge</u> and <u>Route 52 Causeway</u>. Mr. DiMaggio, who is recognized internationally for his technical expertise, has written or co-written FHWA geotechnical guidelines, which have been adopted by several countries as their standards of practice. He serves on technical committees and task forces of many prestigious industry organizations including ACSE, AASHTO and Transportation Research Board.



Mr. Mankbadi led foundation design for Route 52 Causeway



It is our understanding that the NEPA Consultant will be responsible for obtaining environmental permits and approvals. The responsibility of the Design Consultant will be to provide engineering support for the NEPA review and participate in the permitting process by providing required input to the permit applications and coordinating the design with the requirements of the approving agencies. We recognize that seamless collaboration between the NEPA and Design Teams will be critical to keeping the project on schedule. In order to facilitate this process we have created a special APPROVALS/PERMITTING task force, which will be led by Glen Schetelich, PE (H&H), who has supervised design and obtained approvals for dozens of bridge and highway projects







located in New Jersey coastal areas, during his 30-year career. Most of those projects involved complex utility relocations, MPT, contaminated soils, navigational issues, historic preservation, wetlands permitting and stormwater BMPs. Notable examples include *Route 52 Causeway*, *Route 36 Highlands Bridge*, *Route 9 Bridge over Bass River*, *Route 35 Bridge over Navesink River* and many others. Mr. Schetelich has excellent knowledge of the local and state regulatory processes and federal requirements, including environmental permitting and Coast Guard coordination. He has been working extensively with the local agencies and **developed strong relationship with many of the key stakeholders, including NJDOT, NJDEP, USCG, USACE, SHPO** and others. He is currently managing the replacement of the *Great Egg Harbor Bridge Feasibility Study*. He also managed NJ TRANSIT's *Task Order Contract* which involved preparation of Categorical Exclusion Documents and historic preservation issues.

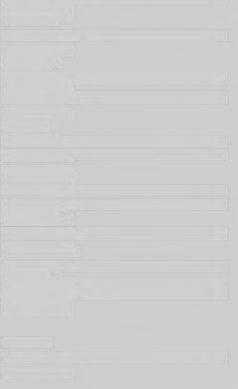


Mr. Schetelich is managing the replacement of Great Egg Harbor Bridge, currently in construction

Mr. Schetelich will be working hand-in-hand with Ramesh Rajagopal, PE (GF) who also has extensive permitting experience. His notable rail projects include the <u>Portal Bridge</u> and the conceptual design for Baltimore's <u>Purple Line</u>, where he was responsible for developing environmental site design standards and stormwater management design alternatives, as well as evaluating right-of-way and environmental impacts to support the environmental assessment document. Mr. Rajagopal is an expert in HYDROLOGY & HYDRAULICS, drainage design, floodplain delineation, stormwater management, flood control, bridge scour evaluations, and soil erosion and sediment control. He led the hydrology and drainage design on many NJ highway improvement/bridge reconstruction projects, including <u>Route 1 & 9 Reconstruction</u>, <u>Garden State Parkway Interchange 142 Improvements</u>, <u>Route 18 Extension</u> and <u>NJ Turnpike Interchange 6 to 9 Widening</u>. He also performed the hydraulic analysis for the replacement of the adjacent Route 35 Victory Bridge.

More details on relevant experience of our Key Personnel and support staff has been provided on the resumes provide with this proposal.







VISHA SZUMANSKI, PE PROJECT MANAGER

REGISTRATION

Professional Engineer: NJ, NY, CT

EDUCATION

B.S.C.E., 1981, Polytechnic University of Koszalin, Poland M.S.C.E., 1985, Columbia University

YEARS EXPERIENCE

Total Years: 30

Hardesty &Hanover



SUMMARY BIOGRAPHY

Visha Szumanski has over 30 years of experience in the design and management of transportation projects, including rail/transit, bridges and tunnels. Her responsibilities include the overall administrative, contractual, financial and technical performance of the projects, interaction with the clients, supervision of subconsultants and coordination with agencies. Throughout her career, she has provided engineering services to many Northeast rail agencies, including **NJ Transit, NYCT, LIRR, PANYNJ, Metro-North, Amtrak and WMATA.**

With H&H: 1

Ms. Szumanski served as the **Chief Structural Engineer** on **high-profile rail and transit projects, such as the Second Avenue Subway and NY Penn Station Redevelopment**. In this capacity she supervised the work of the design teams and was directly responsible for the development of the engineering approach and the overall technical content and quality of the design.

Her experience as the **Project Manager** and **Project Director** includes **complex multidisciplinary projects** with a focus on coordination with various stakeholders, including railroads, state and local agencies, community groups and private utilities. She managed numerous **bridge and station rehabilitation** contracts with NJ Transit, NYCT, Amtrak and WMATA. She was also involved in **rail systems and equipment modernization** projects, such as the NJ Transit MMC Facility; Metro-North Mott Haven Control Center and Mechanical/ Electrical Upgrades at the NY Penn Station for Amtrak.

RELEVANT PROJECT EXPERIENCE

NJ TRANSIT TASK ORDER CONTRACT FOR BRIDGE & RAILWAY ENGINEERING SERVICES, NJ

Project Manager for NJT Task Order Contract for Bridge & Railway Engineering. (2006 – 2009). Notable assignments included:

- **Rehabilitation of Morgan Draw Bridge** on NJ Coast Line over Cheesequake Creek, which is a 60 foot long two-track rolling bascule bridge built in 1912. The rehabilitation involved removal of the existing tread plates, retrofitting of the segmental girders, installation of new, thicker tread plates which conform to the current moveable bridge design standards, and replacement of select mechanical components including pinions, pinion shafts, racks and bearings. Other work included replacement of the adjoining track beams and track plates, and miscellaneous repairs of the bridge superstructure. Key challenges included developing erection scheme to minimize impacts on the service and assure safety. All work was accomplished with minimal train outages.
- **Rehabilitation of Navesink River Bridge** in Red Bank on NJ Coast Line, which is a 100-year old, 40-span steel viaduct. The rehabilitation was focused on the bridge substructure and involved construction of concrete jackets around severely deteriorated column pedestals and extensive repairs of the concrete piers. The project required substantial involvement during construction to address unforeseen field conditions and additional deficiencies uncovered during demolition. Ms. Szumanski successfully assisted NJT in addressing all field issues and keeping the construction on schedule and budget.

MTA BRIDGES & TUNNELS RFK BRIDGE TOLL PLAZA RECONSTRUCTION, NEW YORK, NY

Project Manager for a \$450 million toll plaza reconstruction at the RFK (Triborough) Bridge Facility. This

VISHA SZUMANSKI, PE PROJECT MANAGER

RELEVANT PROJECT EXPERIENCE (CONT.)

included widening of the plaza, adding new piers and footings, re-decking (more than 600,000 sq. ft.), seismic retrofit and extensive utility relocations. The project also included development of the electrical master plan for the Triborough Bridge Facility, as well as construction of a new \$12 million substation and upgrades to the electrical distribution system. Other project components, which required full range of engineering, environmental and architectural services, included design of new utility concourse for the toll plaza and service/maintenance building. The work involved development of complex staging schemes to maintain personnel access during construction and minimize traffic impacts. (2007 – 2013)

NYCDOT ROOSEVELT AVENUE BRIDGE REHABILITATION, QUEENS, NY

Deputy Project Manager in a Joint Venture responsible for a **\$100 million rehabilitation** of 1,400 ft. long Roosevelt Avenue Bridge and viaduct structure over Van Wyck Expressway and the Flushing River. The double-deck structure with 300 ft. long bascule span, built in 1927, carries Roosevelt Avenue on its lower deck and **three tracks of the NYCT Flushing / 7 Line** on its top. The project involved stringer replacement, re-decking and widening of the bridge. Other work included lighting and drainage upgrades, seismic retrofit, reconstruction of the abutments, steel repairs and painting. Some of the key challenges included coordination with NYCT to minimize impact on operations and accessibility issues along the ROW. The work involved extensive permitting/approvals, including NYCDEP, NYSDEC, NYCDPR, Public Design Commission and others. (2007 – 2013)

NYCDOT REPLACEMENT OF BROOKLYN BRIDGE TRAVELERS, NEW YORK, NY

Project Manager for the replacement of four underdeck **maintenance travelers on the landmark Brooklyn Bridge** over the East River. The work involved investigation of the existing travelers, which experienced frequent operational issues, study of different traveler systems, developing recommendations for replacement, and design of new travelers equipped with state of the art electrical and mechanical technology that require minimum maintenance. The project focus was on simplifying maintenance requirements and enhancing safety of the maintenance personnel. (2007 – 2010)

NYCT 2ND AVENUE SUBWAY, NEW YORK, NY

Chief Structural Engineer for the preliminary design of the **\$17 billion NYCT subway expansion project**. Supervised the design of sixteen deep underground stations, ventilation buildings, ancillary facilities and cut-and-cover tunnels (approximately \$12 billion construction cost). The work involved design of mined caverns and deep cut-and cover tunnels utilizing soldier pile and slurry wall construction. The project included extensive underpinning of the existing structures, such as building foundations and tunnel crossings. Other work involved design of vertical shafts to launch the TBM machine. Ms. Szumanski supervised a large team of structural engineers in the production of contract documents. In this capacity she was responsible for the overall technical content and quality of the design including feasibility studies and development of structural alternatives, as well as preparation of contract drawings, specifications and estimates. (2003 – 2005)

NYCT INDEFINITE QUANTITY ENGINEERING SERVICES CONTRACT CM-1135, NEW YORK, NY

Project Manager for a \$7 million on-call contract with **New York City Transit**. Notable assignments included: Threat, risk, and vulnerability assessments at several major NYCT facilities and design of security systems; Bridge inspection and development of **Railroad Bridge Management System** for Staten Island Rapid Transit; Development of Communication-Based Train Control for the Canarsie Line; and communication and public address systems upgrades at various NYCT stations. The security related studies and assessments done under this contract led to the establishment of the MTA System-Wide Security Program. (2000–2003)

AMTRAK - NY PENN STATION REDEVELOPMENT/PATRICK MOYNIHAN STATION, NEW YORK, NY

Structural Discipline Lead for the preliminary design of the **Pennsylvania Station Redevelopment**. The project involved design of a new, 300,000 sq. ft. transportation hub for Amtrak and LIRR at the site of the landmark James A. Farley Building on 8th Avenue and 32nd Street. Supervised team of structural engineers in the design of new railroad concourses and connecting passageways between the existing Penn Station and the new facility, to be located west of 8th Avenue. The key challenges included underpinning of the 8th Avenue subway line and transferring many of the track level columns supporting the building above, to make room for new station platforms. (1997 – 1999)

PAUL M. SKELTON, PE PROJECT PRINCIPAL-IN-CHARGE

REGISTRATION

Professional Engineer: NY, NJ, CT, TX, CA, and 25 others

EDUCATION

B.E., 1985, State University of New York at Stony Brook

YEARS EXPERIENCE

Total Years: 30

With H&H: 30





SUMMARY BIOGRAPHY

Paul M. Skelton is a **Principal** at Hardesty & Hanover with 30 years of experience in the **design of heavy mov-able structures**, with a focus on swing, bascule, and vertical lift bridges. His experience also includes retractable stadium roofs, expandable exhibition halls and other special structures. Throughout his career, He delivered more than 150 movable bridge projects in the US, Europe, Asia, Australia and New Zealand.

Mr. Skelton is a recognized expert in the field of movable bridge engineering, **actively involved in the research and development** through his work on the technical committees of many trade organizations. He is the past *Chairman of the AREMA's Steel Structures Committee* (Committee #15) and the *Movable Bridge Sub-Committee*. He also served as the Chairman of Machinery/Mechanisms Committee of Heavy Movable Structures (HMS). Currently, Mr. Skelton serves on the US Board of the *International Association for Bridge and Structural Engineering* (IABSE) and is a member of Working Council 2. He is also an active member of the Canadian Highway Bridge Design Code. He has authored movable bridge maintenance manuals, as well as technical articles in many prestigious trade publications.

RELEVANT PROJECT EXPERIENCE

PORT ADELAIDE RIVER, PORT ADELAIDE, SOUTH AUSTRALIA

Principal-in-Charge for the design of two new bascule bridges at Port Adelaide in Australia: **200 ft. long single-leaf, single track railroad** bridge and 190 ft. long, four-lane, single-leaf highway bridge. The design of the movable bridges was done in accordance with the AREMA provisions. Both bridges have a **simple-trunnion bascule** arrangement with steel trunnion towers. Special attention was given to the aesthetics of the bridges by employing creative architectural forms. The bascule piers, which normally dominate the appearance of single-leaf bascule bridges, are "V" shaped post-tensioned concrete members. The piers geometry features angles complementary to the open-span angle of the bridge. The bascule girders are welded steel boxes, carefully detailed to achieve a sleek, continuous look. The electrical/mechanical systems were designed to assure **highly reliable and safe operations of the movable span**. The bridge utilizes a PLC control system and is operated remotely from the Traffic Control Center located 5 km from the project site. (2004 – 2008)

CHABAN-DELMAS VERTICAL LIFT BRIDGE, BORDEAUX, FRANCE

Principal-in-Charge for the design of \$146 million Chaban-Delmas Vertical Lift Bridge in Bordeaux, France, which features the **longest lift span in Europe** (383 ft.). The bridge has a lift height of 164 ft. and accommodates 320 ft. wide navigational channel. It was designed to carry four lanes of traffic, two bicycle/pedestrian paths and **two light rail tracks**. H&H designed the bridge operating systems to move the lift span using the minimum energy possible. In order to achieve this, the counterweights and the lift span had to be finely balanced. Operation of the lift span is achieved via high-strength wire ropes passing over sheaves, which connect the lift span to the counterweights. Speed regulators in each tower control the motors, and sensors on the deck continuously track its position to ensure that it remains level at all times. (2004 – 2013)

AMTRAK CONN RIVER BRIDGE MECHANICAL/ELECTRICAL REHABILITATION, OLD SAYBROOK, CT

Principal-in- Charge for mechanical and electrical rehabilitation of Amtrak's Connecticut River Bridge, which is

RELEVANT PROJECT EXPERIENCE (CONT.)

a **single-leaf Scherzer rolling-lift** on the Northeast Corridor. The work involved detailed inspection and full electrical rehabilitation of bridge control systems and addition of auxiliary drive system. (2001 – 2003)

AMTRAK SPUYTEN DUYVIL BRIDGE EMERGENCY REPAIRS, NEW YORK, NY

Principal-in-Charge/ Lead Mechanical Engineer responsible for emergency repairs of the Spuyten Duyvil bridge on Amtrak's Empire Corridor, after the swing span suffered large displacement from a collision due to errant waterway navigation. The emergency repairs included jacking of the 750-ton swing span of the bridge, in both vertical and horizontal direction, to reseat the bridge properly on its structural-mechanical turntable. All work was completed during nighttime without impact on rail operations. (2003)

CONNDOT TOMLINSON BRIDGE OVER QUINNIPIAC RIVER, NEW HAVEN, CT

Lead Mechanical Engineer for the \$120 million replacement of the Tomlinson Bridge, which provides **vehicular and rail crossing** over the Quinnipiac River in New Haven, CT. The replacement structure is a 270-foot tower drive lift bridge over a 240-foot-wide navigation channel with 75 ft. vertical clearance and 22-foot railroad right-of-way. The lift span, which is 90 ft. wide, is the heaviest movable span in the Northeast, moving 6.4 million pounds at each opening. The operating system consists of a mechanical/electrical drive turning the counterweight sheaves at the top of the towers. The span control is provided by an AC primary thyristor control system. Also included is a complete dual system of motors (100 hp) and motor controls for system redundancy. (1992 – 2002)

CN RAILWAY SECOND NARROWS BRIDGE REHABILITATION, BURRARD INLET, VANCOUVER, BC

Principal-in-Charge responsible for a mechanical rehabilitation of the Burrard Inlet **vertical lift railroad bridge** in Vancouver. The CN Second Narrows Bridge, **originally designed by Hardesty & Hanover** has 495 ft. vertical lift span and 150 ft. height, providing **450 ft. navigational channel**. The project involved rehabilitation of auxiliary counterweight machinery, including sheave, hitches, wire rope, and socket replacement. H&H also prepared a maintenance manual for the entire bridge machinery systems. (2000)

BORDEN AVENUE SLIDING RAIL BRIDGE, NEW YORK, NY.

Lead Mechanical Engineer for a mechanical/electrical upgrade of Borden Avenue Sliding Rail Bridge. One of only two of its kind in the entire country, this historic movable bridge is designed to slide onto stationary rails located on the shoreline. The project involved machinery replacement on the "rail side" of the bridge. (1997 – 1999)

AMTRAK BUSH RIVER BRIDGE, PERRYMAN, MD

Project Manager for inspection, rehabilitation design, and load rating for this 2,100-foot viaduct. Provided machinery analysis; repair recommendations; design of structural, mechanical, electrical systems; cost estimates; and condition report for a 40-foot, single-leaf, heel trunnion bascule. Also included was movable catenary system rehabilitation/motor-ization. (1998 – 1999)

PECK DRAWBRIDGE AND BRIDGEPORT VIADUCT, BRIDGEPORT, CT - METRO-NORTH RAILROAD

Lead Mechanical Engineer for \$90 million replacement of a four-track Pequonnock River Drawbridge (PECK) in Bridgeport, CT, which is a **vital link on the Metro-North New Haven Line and Amtrak's Northeast Corridor.** The new bridge is a 138-foot twin single-leaf trunnion bascule span, which provides 105 feet horizontal clearance and 20 feet vertical clearance in the closed position. Mr. Skelton was responsible for design of the movable span operating and lock machinery and all mechanical systems. (1990 – 1998)

CANADIAN NATIONAL MOVABLE BRIDGE DESIGN CODE, QUEBEC, CANADA

Mechanical Engineer on the **technical team developing a new, Canadian Movable Bridge Design Code for nationwide use**, to replace an existing Canadian Standards Association (CSA) Code. Mr. Skelton was the only non-Canadian member of the team. The new code uses LRFD provisions with working stresses for the machinery, and includes mechanical, electrical, and hydraulic sections. (1997)

DAVID A. BOATÉ, PE PROJECT PRINCIPAL-IN-CHARGE



REGISTRATION

Professional Engineer: PA, MD, PA

EDUCATION

B.S.C.E., 1985, University of North Carolina at Charlotte

YEARS EXPERIENCE

Total Years: 31

With Gannett Fleming: 4



SUMMARY BIOGRAPHY

David Boaté is currently **Vice President - Director of Transit and Rail Services** responsible for transit projects in the Northeastern Region of Gannett Fleming, which includes New York, New Jersey, Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire, and Maine. Serves as Principal-In-Charge, Project Manager, Quality Representative, or Task Manager on transit projects or other business line projects that involve transit planning or engineering. Manages or serves as Client Manager for Transit and Railroad Clients, and represents Gannett Fleming for transit issues in the Northeast Region.

As **Member, Transit and Rail Practice Leadership Team**, he is responsible for the firm's overall strategic investment of resources in the pursuit of significant regional, national, and international programs in the national/international transit and rail marketplace in collaboration with the other team members.

RELEVANT PROJECT EXPERIENCE

NJ TRANSIT NORTHEAST CORRIDOR MID-LINE LOOP DESIGN, NORTH BRUNSWICK, NJ

Project Principal for the preliminary design and other activities, including New Jersey EO215 environmental impact statement support, for the preparation of design-build-operate-maintain documents for a new flyover and two high-level passenger stations on the Northeast Corridor. Gannett Fleming is a principal subconsultant to another major consulting engineering firm and is responsible for site and rail roadway engineering, including hydraulics and hydrology, traction power, signals, railway operations, traffic engineering, station management and engineering, right-of-way, and public outreach.

NJ TRANSIT SUBSTATION REPLACEMENTS, KEARNY, HOBOKEN, AND BAY HEAD, NJ,

Project Principal for the design of general power substations, traction power substations, switching substations, and related facilities at the operating locations at Hoboken Terminal/Yard, including the "Depot," Observer Highway, and Henderson substations; Meadows Maintenance Complex, including Building 9, Mason, and ROC substations; and Bay Head Yard, including Bay Head Substation, that were damaged as a result of Super Storm Sandy. This project will replace substation infrastructure that was damaged and incorporate resiliency features in the design to guard against future storm-related events.

NJ TRANSIT HUDSON-BERGEN LIGHT RAIL ALONG NJ ROUTE 440 EXTENSION, JERSEY CITY, NJ

Quality Assurance Reviewer of conceptual engineering for an extension of the West Side-Tonnelle Avenue Line from West Side Avenue Station westward, including alternatives that cross over NJ Route 440. Conceptual engineering included track alignment, undergrade bridges, and new stations.

RELEVANT PROJECT EXPERIENCE (CONT.) EXPERIENCE WITH PRIOR FIRMS

NJ TRANSIT OLD BRIDGE MULTIMODAL STUDY, GREATER OLD BRIDGE TOWNSHIP, NJ

Manager of Engineering and Rail Operations for a planning general engineering consultant assignment that included a study of alternatives for improved transit access from Old Bridge Township to Newark, northern New Jersey, and New York City. Work included reviewing concepts for a new multimodal station on the North Jersey Coast Line between the South Amboy and Matawan/Aberdeen Stations, a conceptual layout of a parking garage at Matawan/Aberdeen Station, and conceptual engineering, traffic, and site design of several short-term and long-term alternatives at an auto-bus park-and-ride at the junction of NJ Route 18 and U.S. Route 9.

NJ TRANSIT RAIL MAPPING, VIDEO, AND GEOGRAPHIC INFORMATION SYSTEMS, NJ / DOWNSTATE NY

Phase I Project Manager and **Phase II Officer-in-Charge** for the development of a GIS system for NJ Transit commuter rail and light rail transit (LRT) systems based on LiDAR Survey and Oracle Database Management. The rail map system provides electronic GIS maps and both locomotive engineers-view and aerial video for the entire 465-mile NJ Transit commuter railroad network, including portions of the rail system that are in New York City and lower New York State, and three LRT systems. Initial applications included incident area mapping and railroad physical characteristics (of territory) training. A prototype system was delivered at the end of Phase I so that more applications, including a track miler and GIS viewer, could be developed in close coordination with NJ Transit staff. The Phase II GIS system is implemented in an enterprise network available to users across NJ Transit's corporate information systems network.

MCCLELLAN STREET BRIDGES REPLACEMENT, NEWARK, NJ

Senior Technical Advisor for the replacement of the three undergrade bridges supporting six tracks (four mainline passenger tracks used by New Jersey Transit and Amtrak and two freight tracks, one used by Conrail Shared Assets and the other abandoned) on the Northeast Corridor near Lane Interlocking to allow for the widening of McClellan Street. Specific responsibilities included assisting in the conceptual design of new undergrade bridges, developing staging scenarios to provide minimum impact on railroad operations, and coordinating with Amtrak, the owner of the bridges.

NJ TRANSIT HUDSON-BERGEN LIGHT RAIL TRANSIT, DESIGN SECTION S-20, BAYONNE AND JERSEY CITY, NJ

Deputy Project Manager for preliminary design for a design-build contract for the construction of a new-start light rail transit system 3-mile segment. The new transit system is located on the former Jersey Central Mainline right-of-way that was used by Conrail. New stations, park-and-ride facilities, retaining walls, track, drainage, and railway right-of-way were in the project scope. More than 1 mile of Conrail freight track relocation was required to connect the Bayonne Branch to the National Docks Line.

NJ TRANSIT HIGH-LEVEL PLATFORM STATION IMPROVEMENTS, NO. JERSEY COAST/RARITAN VALLEY LINES, NJ

Senior Project Engineer - Railway Systems responsible for performing feasibility studies and designing track realignments and signal and catenary modifications for side and center high-level platform alternatives at Matawan, South Amboy, Perth Amboy, Netherwood, Fanwood, and Westfield Stations. Responsibilities included leading the track design and managing signal and catenary work.

NJ TRANSIT HUNTER CONNECTION, NEWARK, NJ

Project Engineer for the preliminary design of \$25 million in improvements to the Raritan Valley Line connection between Conrail's NK interlocking and Amtrak's Hunter Interlocking. Responsibilities included performing the preliminary design of track improvements in NK Interlocking, authoring and coordinating the draft and final preliminary engineering design report, and preparing the preliminary staging and critical path method project schedule.

DAVID S. TUCKMAN, PE DEPUTY PROJECT MANAGER – STRUCTURE & FOUNDATIONS

REGISTRATION

Professional Engineer: NY, FL, MI, MA

EDUCATION

B.S.C.E., 1992, State University of New York at Buffalo

YEARS EXPERIENCE

Total Years: 23

HH Hardesty &Hanover



SUMMARY BIOGRAPHY

David Tuckman has extensive management background and strong technical expertise in the **design and rehabilitation of fixed and movable bridges** and other transportation structures. During his 23 years of career, he has participated in a variety of bridge, tunnel, rail and highway projects. His work involved both new construction, and repair/rehabilitation of existing structures. He has been **responsible for all phases of project delivery**, including inspections, engineering analyses, feasibility studies, structural rehabilitation designs, agency coordination and preparation of comprehensive contract documents. His particular strength is in **multidisciplinary coordination in the design of movable bridge structural, mechanical and electrical systems**.

With H&H: 23

Mr. Tuckman's notable work includes his role as the **Project Engineer** for the design of **Woodrow Wilson Bridge**, the world's largest movable bridge. He had similar role in the design of **Port River Bridges** in Adelaide, Australia, which included a **new 200 ft. long bascule railroad bridge**. His other railroad bridge projects include the replacement of **Amtrak's Peck Bridge** on Northeast Corridor and emergency repairs of the **Saugus River Drawbridge** in Boston, which carries MBTA commuter railroad. Mr. Tuckman also served as a **Deputy Project Manager** on a **\$350M Kew Gardens Interchange Improvements** project.

RELEVANT PROJECT EXPERIENCE

BNSF CREATE PROJECT WA-4: BNSF PANHANDLE TRACK, CHICAGO, IL

Project Engineer for the structural rehabilitation of a 100-year-old railroad bridge for BNSF railway, which consists of 150 ft. long main span and two 105 ft. long approaches. The bridge is not currently in use but **will be restored to a two-track bridge compliant with current AREMA standards**. Rehabilitation of the approaches includes reconstruction and repair of the concrete and masonry substructure, replacement of existing approach spans with steel plate girders, replacement of existing bearings, and installation of new ballasted deck. The main movable span truss has been retrofitted to be fixed in the closed position. The rehabilitation design includes repairs to existing counterweight, repair of existing floorbeams, replacement of stringers, replacement of traction bracing, replacement of live load bearings and a new span lock. (2011 – present)

CHABAN-DELMAS VERTICAL LIFT BRIDGE, BORDEAUX, FRANCE

Senior Structural Engineer for the design of \$146 million Chaban-Delmas **Vertical Lift Bridge** in Bordeaux, France, which features the **longest lift span in Europe** (383 ft.). The bridge has a lift height of 164 ft. and accommodates 320 ft. wide navigational channel. It was designed to carry four lanes of traffic, two bicycle/pedestrian paths and **two light rail tracks**. H&H designed the bridge operating systems to raise and lower the lift span using the minimum energy possible. In order to achieve this, the counterweights and the lift span had to be finely balanced. Responsible for structural design and the coordination of design efforts between structural, mechanical, and electrical engineers. (2005 – 2013)

PORT ADELAIDE RIVER, PORT ADELAIDE, SOUTH AUSTRALIA

Project Engineer for the design of two new bascule bridges at Port Adelaide in Australia: **200 ft. long single-leaf, single track railroad bridge** and 190 ft. long, four-lane, single-leaf highway bridge. The design of the

DAVID S. TUCKMAN, PE DEPUTY PROJECT MANAGER – STRUCTURE & FOUNDATIONS RELEVANT PROJECT EXPERIENCE (CONT.)

movable bridges was done in accordance with the AREMA provisions. Both bridges have a **simple-trunnion bascule** arrangement with steel trunnion towers. Special attention was given to the aesthetics of the bridges by employing creative architectural forms. The bascule piers are "V" shaped post-tensioned concrete members. The piers geometry features angles complementary to the open-span angle of the bridge. The bascule girders are welded steel boxes, carefully detailed to achieve a sleek, continuous look. (2004 – 2008)

WOODROW WILSON BASCULE BRIDGE, WASHINGTON DC

Project Engineer for the design of Woodrow Wilson Bridge, a signature crossing over the Potomac River just south of Washington, which links Maryland to Virginia. The bridge is 6,000 ft. long and has **four, side-by-side, 222 ft double-leaf bascule spans** that provide navigational clearances of 175 ft. horizontally, 70 ft. minimum vertical clearance in the span-down position, and completely unrestricted vertical clearance with the span raised. The parallel double-leaf spans have 270 ft. center-to-center trunnion spacing. The bridge carries twelve lanes of Interstate I-95/495 traffic and was design to accommodate a **future commuter rail system**. The new bascule spans weighting approximately 2000 tons each comprise the **world's largest bascule bridge**. Responsible for superstructure design of the movable span and for overall interdisciplinary coordination, including structural, mechanical and electrical systems. (2000 – 2009)

MBTA SAUGUS RIVER DRAWBRIDGE REHABILITATION, BOSTON, MA

Project Engineer for emergency repairs of a vintage Saugus River Drawbridge carrying two tracks of **MBTA commuter rail**. Inspection conducted by H&H revealed severe deterioration of the rest pier. H&H conducted 3D computer analysis, which indicated insufficient pier capacity to resist longitudinal loads due to acceleration and braking forces, and transverse wind loads. Interim repair involved installation of six 48-inch diameter reinforced concrete drilled shafts socketed to bedrock 120 feet below seawater, with connecting structural frames to brace the existing pier. The final repair will include installation of a 70-ton permanent steel box girder spanning between the drilled shafts to resist all vertical and horizontal loads. (2012)

AMTRAK/METRO-NORTH PECK RAILROAD DRAWBRIDGE REPLACEMENT, BRIDGEPORT CT

Project Engineer for the \$90 million replacement of inoperable rolling-lift span drawbridge over the Pequannock River, and the adjoining Bridgeport Viaduct railroad structure with a new, **four-track**, **single-leaf bascule railroad bridge**. The new bridge is a 138-foot twin single-leaf trunnion bascule span, which provides 105 feet horizontal clearance and 20 feet vertical clearance in the closed position. Designed temporary 800-foot-long, two-track railroad to bypass main river construction. Responsible for reviewing contractor's shop drawings and providing construction support, including revision of details in response to field conditions. (1994 – 1998)

NYSDOT KEW GARDENS INTERCHANGE, QUEENS COUNTY, NY

Deputy Project Manager for this **\$350 million infrastructure improvement project**. The Kew Gardens interchange is the confluence of the Van Wyck Expressway, Grand Central Parkway, Jackie Robinson Parkway, Queens Boulevard and Union Turnpike in Queens, NY. The project scope included preliminary and final design (Phases I-VI) for the reconstruction, realignment or relocation of the mainline of three freeways and their connector ramps and reconstruction/rehabilitation of 15 structures associated with these roadways. The work involved complex traffic analysis and required extensive environmental coordination and permitting due to proximity to parkland and wetland areas. Other scope elements included design of new drainage system; relocation of numerous public and private utilities; and providing pedestrian access to the nearby subway station. Mr. Tuckman was responsible for coordination of work between various disciplines and preparing design submittals. His responsibilities also included obtaining permits and approval and coordination with third parties and outside agencies, such as NYCT, NYCDEP, community boards and private utilities. (2007 – 2010).

ALFORD STREET BRIDGE OVER THE MYSTIC RIVER, BOSTON, MA

Deputy Project Manager responsible for coordination of interdisciplinary design efforts on the \$50 million structural, mechanical, and electrical rehabilitation of this 1,400-foot-long bridge crossing the Mystic River. The bridge comprises eight spans: seven approach spans and **twin double-leaf steel bascule** (160 feet long). The project involved a complete replacement of the existing four bascule leaves and approach superstructure, including girders, floorbeams and stringers. Other work included deck replacement, new lighting and traffic control system. The new deck is steel grid deck, half-filled with concrete along the stringer lines to reduce fatigue stresses. (2000 – 2011)

RICHARD CROSS IV, PE DEPUTY PROJECT MANAGER – TRACK & SYSTEMS



REGISTRATION

Professional Engineer: PA, MN, MI NJT Roadway Worker Protection/Contractor Safety

EDUCATION

B.S.C.E., 1977, Lafayette College

YEARS EXPERIENCE

Total Years: 38

With Gannett Fleming: 20



SUMMARY BIOGRAPHY

Richard Cross IV is a **Vice President/Track Director** with Gannett Fleming's Transit & Rail Systems group responsible for **railroad**, **transit**, **and roadway design**; **facility and rail yard design**; **land surveying**; **right-of-way plans**; **stormwater management**; **and utilities**. Supervises diverse design teams including civil, rail systems, structural, mechanical, electrical, and geotechnical engineers.

In his role, Mr. Cross is also responsible for the complete development of plans, specifications, and cost estimates for conceptual, preliminary, and final designs, as well as interaction with clients and review/permitting agencies. He has performed similar roles on such projects as the **Niantic River Bascule Bridge Replacement** project for Amtrak; the concept study for NJ Transit's **Brielle Drawbridge**; and the **Portal Bridge Capacity Enhancements** project for NJ Transit.

RELEVANT PROJECT EXPERIENCE

BRIELLE DRAWBRIDGE CONCEPTUAL STUDY, BRIELLE, NJ

Lead Engineer – Railway Operations and Systems responsible for systems design, civil engineering and environmental investigations for this movable bridge replacement study. Gannett Fleming's work included survey oversight, conceptual design of alternative profiles to accomplish the track raise based on different movable bridge types, relocation designs of existing Brielle Interlocking, operations analysis of construction staging, defining environmental impacts of alternative designs, listing of permitting agencies involved, signal designs of alternative interlocking placements including modifications to protect train movements and cost estimating of Capital and Force Account expenses.

PORTAL BRIDGE CAPACITY ENHANCEMENTS, NEWARK, NJ

Project Manager for the preliminary and final engineering for a critical 2.5 mile section of the Amtrak Northeast Corridor between Newark, New Jersey, and New York City. Led the tri-venture and 27 subconsultants in redesigning the most heavily travelled corridor in the country, carrying both Amtrak's high-speed intercity service and NJ Transit's commuter service. The \$1.6 billion project involves expanding the two-track railroad to five tracks and reprofiling it to replace the existing swing bridge with two fixed bridges over the Hackensack River to eliminate a long-standing operational bottleneck. The enhancements include the design of 29 bridges (with 124 spans) and related civil, track, signal (5 new interlockings), catenary, electric traction switching substation, seven control centers, land acquisition, wetland mitigation, and contaminated sites in the environmentally sensitive Hackensack Meadowlands. Due to the 472 trains per day of traffic, detailed construction staging was developed to minimize impacts to operations.

NIANTIC RIVER DRAWBRIDGE ON NORTHEAST CORRIDOR, NIANTIC, CT

Deputy Project Manager – Track & Systems responsible for the overall design of track alignment and profile, electric traction, geotechnical analysis, retaining walls, earthwork, drainage, utilities, and soil erosion and sediment pollution control. The project involved realigning Amtrak's Northeast Corridor 58 feet south of the existing track bed in order to construct a new bascule bridge to carry high-speed passenger rail lines over the Niantic River.

RICHARD CROSS IV, PE DEPUTY PROJECT MANAGER – TRACK & SYSTEMS RELEVANT PROJECT EXPERIENCE (CONT.)

PRELIMINARY ENGINEERING FOR NORTHERN BRANCH COMMUTER LINE, NORTHERN NJ

Project Manager responsible for the preliminary design of an 11-mile extension of the Hudson-Bergen light rail system from North Bergen to Tenafly. Alternatives evaluated included both light rail transit and diesel multiple unit trains. Preliminary design allowed for nine stations along the corridor with either at-grade parking or parking structures. The corridor would share right-of-way with the CSX Northern Branch as well as the New York Susquehanna and Western Railroad. Five undergrade bridges, as well as a new overhead bridge carrying the CSX River Line, would need to be reconstructed or extended. The project included several viaducts to carry the transit line over CSX tracks and mitigating impacts to wetlands, floodways, and adjacent properties. Our firm was responsible for design including operations, track, structural, communication and signals, electric traction alternatives, and construction staging.

PORTAL BRIDGE CAPACITY ENHANCEMENT, SECAUCUS AND KEARNY, NJ

Task Manager responsible for **coordinating design engineering** efforts during the EIS phase for the alternatives analysis and environmental impact statement for a complex, multi-disciplined bridge replacement. The Portal Bridge is critical to Northeast Corridor's access to New York City, and its replacement is essential to Amtrak and New Jersey Transit's future plans to increase transit service between New Jersey and New York. Responsible for evaluating more than 40 alternatives and analyzing impacts to wetlands, floodways, and adjacent properties from the rail operations, track, structural, communication and signal, electric traction, and geotechnical perspectives of this time-sensitive project. Construction staging and duration, as well as the estimated cost for numerous design options, were instrumental in defining the preferred alternatives. The environmental review was overseen by the Federal Railroad Administration.

CALTRAIN RAIL CORRIDOR ELECTRIFICATION PROGRAM MANAGEMENT SERVICES, MENLO PARK, CA

Task Leader for the clearance improvements necessary to allow for a proposed Overhead Contact System (OCS) and higher freight car movements. The project included LiDAR survey, analysis of various AAR Plates and vehicle clearance envelopes, and design services for excavation and reinforcement of four 110-year old brick lined tunnels along the Caltrain right-of-way from San Francisco to San Jose, California. Caltrain presently operates diesel service on this route and will convert to a 25 kV 60 hertz electrification system to operate a new EMU service. Design made allowances for the future CAHSR operation.

CORRIDORONE MINIMUM OPERATING SEGMENT, MECHANICSBURG TO LANCASTER, PA

Task Manager for trackwork responsible for the preliminary design of the start-up transit system linking the Harrisburg Transportation Center with Mechanicsburg to the west and Lancaster to the east. The western leg of the proposed transit line, initially 6 miles, would use Norfolk Southern's existing Shippensburg Secondary right-of-way and shared trackage. The east leg would share use of the existing track of Amtrak's Harrisburg Line. Responsible for new track alignment and tie-ins with Norfolk Southern and for track modifications and improvements to Amtrak's Harrisburg Station and Lancaster Station. Responsibilities also included conducting negotiations with Amtrak and Norfolk Southern.

TRACK IMPROVEMENTS AT ELM INTERLOCKING, GREENSBORO, NC

Task Manager responsible for the final design of track reconfigurations on the Norfolk Southern main line. The project involved relocating 6,000 feet of existing mainline track, double-tracking 3,000 feet with new mainline track, and installing three No. 20 crossovers in Elm Interlocking. Tasks involved the design of the overall site layout, horizontal and vertical track alignments, grading, track drainage, construction staging plans, and specifications. The work was performed in conjunction with NCDOT's work on the Greensboro Multimodal Transportation Center, which involved renovating Greensboro's historic train station as a multimodal facility to serve Amtrak and the Regional Transportation Authority's bus network. Participated in planning and coordination meetings with NCDOT, Norfolk Southern, and the Regional Transportation Authority.

STEVEN D. HARLACKER, PE, SE QUALITY ASSURANCE MANAGER

REGISTRATION

Professional Engineer: CT, NY, LA, ME, MA, NH, WA Structural Engineer: LA, WA

EDUCATION

B.S.C.E., 1996, Lehigh University

YEARS EXPERIENCE

Total Years: 19

HH Hardesty &Hanover



SUMMARY BIOGRAPHY

Steven D. Harlacker has 19 years of experience in all aspects of technical work from inspection, condition assessment and scoping, through feasibility studies and engineering analysis, including load rating, fatigue evaluation and seismic vulnerability assessment, to design and detailing of steel and concrete structures. His extensive technical expertise allows him to assist the design teams in the Quality Assurance and Quality Control of the work products on a large variety of bridge rehabilitation and design projects.

With H&H: 19

As the **Quality Assurance Manager**, Mr. Harlacker gets involved in detailed design reviews of the plans and specifications produced by the design teams, to verify the adequacy and efficiency of the design, as well as the compliance with the applicable standards. As the firm's **Quality Control Director**, he is responsible for internal quality reviews and confirmation of the compliance with the project quality management plans. He conducts design verification through internal quality audits at the milestone submissions and communicates his findings directly to the firm's upper management. His responsibilities also include approval of the quality management plans and maintaining and upgrading of the existing Quality System to meet the client's requirements and be compatible with the **ISO 9001 Standards**.

Some notable projects where Mr. Harlacker served as the **Quality Control Engineer** include **NYSDOT Accel**erated Bridge Program, Region 8 and the **Rehabilitation of Murray Morgan Bridge** in Tacoma, WA. Both of these projects were design/built, which meant that the designer had to adhere to the contractor's quality assurance/control processes in addition to meeting the internal and the owner's requirements. Mr. Harlacker was responsible for integrating the QA/QC requirements of the individual parties (owner, contractor and internal) into the design work of the Hardesty's team.

Mr. Harlacker was responsible for quality management on many high profile transportation projects delivered to **NYSDOT, PANYNJ, Amtrak, NJDOT, NJ Transit, TBTA, ConnDOT and MassDOT**. For example, he performed internal project quality audits for the NYSDOT Kew Gardens Interchange project (Region 11), which involved three contracts with a total construction value of \$380 million. On the firm's recent, fast-paced project, the **I-84** (Aetna Viaduct) Emergency Repairs in Hartford, CT, Mr. Harlacker reviewed compliance with Hardesty's Quality Management standards to assure adequacy of the information collected in the field and to verify that all areas requiring rehabilitation were addressed. He also evaluated the suitability of the proposed repair methods and materials.

Under the firm's continual effort to update and implement the QA/QC controls, Mr. Harlacker served on a QA/ QC Team that reviewed and revised or supplemented Hardesty's guideline documents for Quality Management to bring them to the current industry standards. Mr. Harlacker has been implementing the Quality Assurance processes firm-wide and performing QA/QC audits on all Hardesty's projects.

RELEVANT PROJECT EXPERIENCE

MURRAY MORGAN BRIDGE REHABILITATION, TACOMA, WA

Quality Control Engineer responsible for supervising the structural design aspects and Quality Assurance of the complete rehabilitation on this 100 year old lift bridge. Completed using the Design/Build delivery method, this rehabilitation project included structural, mechanical and electrical rehabilitation of the bridge components. As

STEVEN D. HARLACKER, PE, SE QUALITY ASSUANCE MANAGER

RELEVANT PROJECT EXPERIENCE (CONT.)

the Quality Assurance and Quality Control Engineer, Mr. Harlacker was responsible for review and verification of preliminary and final design documents prepared by multiple collaborators for contract compliance. (2011 – 2013)

NYSDOT ACCELERATED BRIDGE PROGRAM, REGION 8, NY

Quality Control Engineer responsible for the **Quality Control** of all work conducted as part of this multi-bridge Design/Build project. The Zone 2 ABP project involves rapid design and construction of deck replacements for 13 bridges throughout Region 8. Responsible for developing the design Quality Management Plan in compliance with NYSDOT requirements. Responsible for assessment and evaluation of the Design-Builder's design QC activities for the purpose of certifying that the Design-Builder is in compliance with the Project Quality Plan and contract requirements. (2012 – Present)

CONNDOT I-84 HARTFORD (AETNA VIADUCT) PHASE 1 (EMERGENCY REPAIRS), HARTFORD, CT

Quality Control Engineer responsible for quality control of the structural work on a project that involved inspection and development of repair concepts, economic and feasibility evaluations, and structural evaluation. Responsible for design and design team coordination for development of repairs to the concrete deck, rolled steel deck girders, structural steel pier caps. Responsible for construction support services and supplemental design during construction to address necessary repairs to bridge elastomeric bearings and concrete pier caps. (2006 – 2011)

KEW GARDENS INTERCHANGE IMPROVEMENTS, QUEENS, NY

Quality Control Engineer on a \$380 million highway improvement project focused on the confluence of the Van Wyck Expressway, Grand Central Parkway, Jackie Robinson Parkway, Queens Boulevard and Union Turnpike in Queens, NY. With a volume of 300,000 vehicles per day, the multilevel interchange is notorious for traffic congestion and high accident rates. The project scope includes design for the reconstruction, realignment or relocation of the mainline of three freeways and their connector ramps and reconstruction/rehabilitation of 15 structures associated with these roadways. Also included are 1,300 LF of MSE retaining walls and 1,400 LF of precast modular walls. (2010 – 2012)

WTC TRANSPORTATION HUB (PATH), NEW YORK, NY

Construction Support Engineer providing engineering support to the contactor for all site logistics, access, and construction issues including the design of temporary bridges, platforms, underpinning, roads, and falsework for this \$2 billion project. Developed innovative solutions to facilitate construction operations on this complex, congested site. Specific assignments included design of a temporary roof structure and a complex temporary support system to allow continued use of the existing PATH station by an average of 50,000 commuters daily during construction of the new transportation hub and adjacent NYC Transit 1/9 subway line. (2012- 2013)

CONNDOT ROUTE 34 OVER METRO NORTH NEW HAVEN YARD, NEW HAVEN, CT

Project Engineer for a \$10 million rehabilitation of a 680-ft, 3-span, continuous highway bridge spanning over the Metro-North New Haven Yard. Responsible for inspection and evaluation of the existing structure, development of repair alternatives to satisfy the client needs, design to implement the selected rehabilitation options, and construction support services. Inspection access over MNRR tracks required using fixed and/or movable platforms to maintain the train service at all times. (2000 – 2005)

BRUCE R. SMITH, PE QUALITY ASSURANCE MANAGER



Professional Engineer: PA, OH, KY, MA e-RAILSAFE Badge: e-VERIFILE.COM, Inc.

EDUCATION

B.S.C.E., 1996, Pennsylvania State University

YEARS EXPERIENCE

Total Years: 38

With Gannett Fleming: 15





SUMMARY BIOGRAPHY

Bruce R. Smith is a **Quality Manager** with Gannett Fleming's Transit & Rail Systems group responsible for implementing the requirements of the corporate Gannett Fleming, Inc., Quality Management System within the Gannett Fleming Transit & Rail Systems (GFT&RS) Division. The Quality Management System is certified by a third-party registrar as compliant with the requirements of ISO 9001:2008. He is serving as Auditor for internal Gannett Fleming, Inc., quality audits.

Mr. Smith establishs, implements, maintains, and controls the documents and records that comprise the quality procedures specific to GFT&RS as well as to project-specific quality management systems. He performs training employees and subconsultants in the requirements of project-specific quality management systems; maintaining training records; and coordinating quality requirements with subconsultants.

Additionally, Mr. Smith is a **Program Management Oversight Consultant (PMOC)** responsible for reviewing design phase quality management plans for compliance with Federal Transit Administration quality assurance / quality control requirements. Assignments include: Columbia River Crossing, Portland, Oregon/Vancouver, Washington, Washington State Dept. of Transportation / Oregon Dept. of Transportation; Silicon Valley – Berrsea Extension Project, metropolitan San Jose, California, Santa Clara Valley Transportation Authority; BART Oakland Airport Connector Project, Oakland, California; and the South Sacramento Corridor Phase 2, Sacramento, California, Sacramento Regional Transit.

RELEVANT PROJECT EXPERIENCE

CALTRAIN MODERNIZATION PROGRAM, SAN FRANCISCO - SAN JOSE, CA

Quality Manager as part of the Owner's Representative for Electrification Support Services responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

AMTRAK NIANTIC DRAWBRIDGE, EAST LYME, CT

Quality Manager responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

NICTD POSITIVE TRAIN CONTROL PROGRAM MANAGEMENT, KENSINGTON, IL – SOUTH BEND, IN

Quality Manager responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

RELEVANT PROJECT EXPERIENCE (CONT.)

EAST, SOUTHWEST LIGHT RAIL TRANSIT, MINNEAPOLIS, MINNESOTA - HOPKINS, MN

Quality Manager responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

NATIONAL CAPITAL PURPLE LINE LIGHT RAIL TRANSIT, BETHESDA-NEW CARROLLTON, MD

Quality Manager as part of the General Engineering Consultant team responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

DENVER RTD EAGLE P3 SIGNAL DESIGN AND OPERATIONS SIMULATION, METROPOLITAN DENVER CO

Quality Manager responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

PORTAL BRIDGE CAPACITY ENHANCEMENT, NEWARK, NJ

Quality Manager responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

POSITIVE TRAIN CONTROL, PHILADELPHIA, PA

Quality Manager responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

CORRIDORONE PRELIMINARY ENGINEERING, HARRISBURG, PA

Quality Manager responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

NORTH SHORE CONNECTOR - SYSTEMS ENGINEERING, PITTSBURGH, PA

Quality Manager responsible for assuring that quality assurance requirements are established and quality control requirements are followed in accordance with the project-specific Quality Management Plan. Quality responsibilities typically include training, checking of deliverables, subconsultant reviews, project audits and coordination between disciplines and subconsultants.

RESTORATION OF SUBWAY 1 AND 9 LINES, NEW YORK, NY

Task Manager responsible for providing track and civil engineering support to the general contractor reconstructing NYCT's 1 and 9 Lines in Lower Manhattan. Approximately 1,200 LF of the existing subway structure was destroyed or extensively damaged during the 9/11 terrorist attack on the World Trade Center.

EAST SIDE ACCESS, QUEENS, NY

Senior Engineer responsible for preparing the preliminary design construction cost estimate and the preliminary design report for the East Side Mid-Day Storage Yard, which will consist of a new 26-track storage yard, yard office, and other support facilities. Also prepared the preliminary design construction cost estimate for the Arch Street Yard and Shop.

CHARLIE GEER, PE RISK MANAGER

REGISTRATION

Professional Engineer: FL, GA, TX

EDUCATION

B.S.C.E, 1976, University of Florida M.B.A., 1980, University of Houston

YEARS EXPERIENCE

Total Years: 35

Hardesty &Hanover



SUMMARY BIOGRAPHY

Charlie Geer has more than 35 years of experience working for major consulting firms in various roles related to managing risk in engineering and construction. He is a **licensed professional engineer** with hands-on design management experience, assisted by his **graduate degree in business administration**.

With H&H: 1

As a *Risk Manager*, Mr. Geer has been responsible for **identifying**, **assessing and evaluating potential risks** to the projects, which could have an adverse impact on the schedule, budget and the overall project outcome. He has been very successful in **developing and implementing processes/procedures to mitigate project risks** and monitor the effectiveness and the end results of the risk mitigation strategies. His risk management approach is based on the mantra, "**prevention is better than cure.**" He focusses on avoiding threats and mitigating the effects of those which are essentially unavoidable. His success in risk management is based on good understanding of the project objectives; the delivery process and responsibilities of each party involved; the environmental impact issues; constraints; public involvement and regulatory requirements for major transportation projects. His major responsibilities and areas of expertise include:

- **Risk Management Planning** developing the overall risk management approach and strategies to identify and address project risks, which could have an adverse effect on the project outcome
- **Risk Assessment** identifying, estimating and describing the anticipated project risks, defining the potential impacts and risk levels, and identifying the risk owners
- **Risk Evaluation** comparing estimated risks with the criteria established for the project, including schedule, budget and environmental factors; establishing and quantifying acceptable risk level
- **Risk Workshops** leading working sessions with the design team and the owners to identify project risks and develop the most efficient mitigation strategies
- **Risk Register** reporting the risks in an appropriate way for the owner and other project participants to understand the most significant risks, the potential consequences and the accountability of all parties involved in the project delivery process
- **Risk Mitigation** providing support to the project staff and the owner to build risk awareness and develop efficient risk mitigation strategies; assisting in developing and evaluating best options for handling or transferring the of risks

Mr. Geer served as quality, liability, and risk manager in major consulting firms in the transportation industry. His responsibilities included performing contract reviews, establishing quality-control systems, developing risk registers and risk management plans, as well as facilitating claims and dispute resolution. He is the former national **Chairman of the ACEC Risk Management Committee**, accomplished facilitator of risk management workshops and author of many papers and industry guidelines. Throughout his career, Mr. Geer successfully managed risk on major transportation and infrastructure improvement projects, including land development, roadway reconstruction, highway improvements, airport expansion and water treatment facilities. His risk management expertise includes alternative delivery methods, such as Public-Private Partnership (P3). All of his projects were delivered on schedule and within the budget, to a full satisfaction of the owner.

RELEVANT PROJECT EXPERIENCE

I-595 DESIGN-BUILD PROJECT (P3 DELIVERY PROJECT), FORT LAUDERDALE, FL

Risk Manager for the first segment of \$1.8 billion I-595 Corridor Roadway Improvements project in Ft Lauderdale, which involved reconstruction and widening of the I-595 mainline and all associated improvements to the frontage roads and ramps from the I-75/Sawgrass Expressway interchange to the I-595/I-95 interchange, for a total project length of approximately 10.5 miles. A major component of the project was the construction of three at-grade reversible express toll lanes serving express traffic to/from the I-75/Sawgrass Expressway from/to east of SR 7, with a direct connection to the median of Florida's Turnpike. The project was implemented as a public-private partnership (P3) between FDOT and a private concessionaire to design, build, finance, operate, and maintain the roadway for a 35-year term. Reconstruction of I-595 significantly improved traffic conditions and enhanced transportation corridor, which is vital to the shipment of goods in South Florida and the regional economy. Construction of the first segment was successfully completed on schedule and within the budget. Mr. Geer was responsible identifying project risks and developing risk register. He facilitated risk management workshops for the P3 delivery team and assisted in developing efficient mitigation strategies.

FLORIDA EVERGLADES RESTORATION - STORMWATER TREATMENT AREA 1A

Risk Managerfor a \$75 million infrastructure project focused on improving water quality in Everglades, Florida, by creating more than 6,500 acres of new stormwater treatment areas (STAs) and additional water storage. Located immediately northwest of the Arthur R. Marshall Loxahatchee National Wildlife Refuge, STA-1 West removes excess phosphorus and other nutrients from water flowing into the refuge and other parts of the greater Everglades. The expansion of the STA has doubled its capacity, further reducing phosphorus concentrations. Mr. Geer was responsible for risk assessment and management. The project was completed on schedule and within the budget.

PALM BEACH INTERNATIONAL AIRPORT, PALM BEACH, FL

Risk Manager on a program management contract for a \$100 million capital improvement project at Palm Beach International Airport, which included construction of a new terminal building, access roads, parking and airside aprons. The 600,000 square foot terminal has 28 aircraft gates with the potential for 24 additional gates in the future; concession mall which runs the length of the building; three passenger concourses and holding areas. The project also involved improvements to the existing access roadways and construction of new parking areas. Mr. Geer was responsible for risk assessment and management, including development of mitigation strategies.

STEVEN HOM, PE CONSTRUCTABILITY REVIEW

REGISTRATION

Professional Engineer: CT, NY

EDUCATION

B.S.E., 1982, University of Connecticut

YEARS EXPERIENCE

Total Years: 33

Hardesty &Hanover



SUMMARY BIOGRAPHY

Steven Hom has over 30 years of **diversified design, management and construction experience** in the rehabilitation and replacement of the infrastructure, including bridges, railroads, highways and related facilities. His experience encompasses both design and construction management/construction inspection services. As a **Project Manager**, he has been responsible for all phases of project delivery, including inspections, engineering analyses, feasibility studies, structural rehabilitation designs, constructability reviews, agency coordination and preparation of comprehensive contract documents. As the **Resident Engineer** he has been responsible for the supervision and inspection of the construction activities to assure that the contract requirements and the construction industry standards have been met.

With H&H: 33

Mr. Hom also participated in projects that involved **Construction Engineering** services, such as the erection of the **World Trade Center Transportation Hub**. These services included engineering support for all site logistics, access, and construction issues including the design of temporary bridges, platforms, underpinning, roads, and falsework for this \$2 billion project

Through his diverse experience, Mr. Hom has **hands-on knowledge and understanding of the constructability issues**; current industry practices; means and methods of construction, as well as the permitting requirements and the responsibilities of the designer and contractor in each stage of the project delivery.

RELEVANT PROJECT EXPERIENCE

WTC TRANSPORTATION HUB CONSTRUCTION ENGINEERING SUPPORT, MANHATTAN, NY

Project Supervisor responsible for construction engineering services in the erection of the \$2 billion World Trade Center Transportation Hub. Work included structural engineering support for all site logistics, access, and construction issues. Notable assignments included design of a temporary erection platform used for the erection of the main elements of the new PATH Hall roof structure. H&H **developed many creative solutions to facilitate construction operations on this complex, congested site**, including temporary re-support system for the existing columns (underpinning), to allow construction of the new footings while maintaining a continued use of the existing PATH station. H&H was also responsible for coordination of the construction staging with the various stakeholders at the site. (2009 – 2012)

AMTRAK'S NIANTIC RIVER BRIDGE, EAST LYME AND WATERFORD, CT

Deputy Project Manager for responsible for **constructability reviews** and **Construction Support Services** for the Niantic River Movable Bridge replacement project on Amtrak's Northeast Corridor. The constructability reviews conducted by Mr. Hom focused on the **construction phasing, maintenance and protection of railroad operations, construction access, and operational and safety issues**. He was also responsible for the coordination of the architectural, mechanical, electrical and structural submittals and assisted in resolving field problems. (2009 – 2014)

AMTRAK'S CONNECTICUT RIVER BRIDGE, OLD SAYBROOK, CT

Project Engineer for in-depth inspection and feasibility study of bridge replacement alternatives for the Con-

STEVEN HOM, PE CONSTRUCTABILITY REVIEW

RELEVANT PROJECT EXPERIENCE (CONT.)

necticut River Bridge, between Old Saybrook and Old Lyme, CT, which carries 35 passenger trains (Amtrak and Shore Line East) and 6 freight trains per day. H&H developed and analyzed feasible replacement alternatives with a **focus on operational, environmental and ROW impacts; cost; and the extent to which they meet the project objectives**. A set of highly ranked alternatives, called "Best Solution Study Alternatives", was selected to provide Amtrak with several solutions, which were compared with regards to their cost and technical benefits. (2006 – 2007)

CONNDOT TOMLINSON BRIDGE OVER QUINNIPIAC RIVER, NEW HAVEN, CT

Project Engineer during construction phase of a \$120 million replacement of Tomlinson Bridge, which provides **vehicular and rail crossing** over the Quinnipiac River in New Haven. The existing double-leaf bascule bridge was replaced with a new 270-foot-long, vertical-lift bridge. As the Movable Bridge Liaison, Mr. Hom coordinated activities between the design team, resident engineer and the owner, providing technical expertise required at the site to resolve structural, mechanical, and electrical issues. (1996 – 2002)

PECK DRAWBRIDGE AND BRIDGEPORT VIADUCT REPLACEMENT, BRIDGEPORT, CT

Field Engineer responsible for providing technical expertise at the site for this \$90 million replacement of the PECK Bridge, which is a vital link on the Metro-North New Haven Line and Amtrak's Northeast Corridor. The new bridge designed by H&H, which replaced the existing inoperable rolling lift, is a 138-foot twin single-leaf trunnion bascule span. Key challenges included **coordination with the underground utilities, overhead power lines, catenaries and signals**. Also, special study of the existing foundations was required since the substructure of the bridge experienced significant horizontal movement during its long lifespan. Hardesty & Hanover also designed a temporary, 800-foot-long structure to bypass the bridge and maintain uninterrupted rail operations during the construction period. (1996 – 1998)

CONNDOT 2011–2015 INSPECTION OF METRO-NORTH BRIDGES, CT

Project Manager responsible for the mechanical and electrical **inspection of 5 movable bridges on the Metro-North New Haven line**. Performed routine and verification inspections for the Cos Cob, Norwalk, Saugatuck, Bridgeport and Devon movable bridges. Work included preparation of inspection reports, which identify and prioritize the repairs. (2011-present)

TBTA RFK BRIDGE MANHATTAN-QUEENS RAMP REPLACEMENT, RANDALL'S ISLAND, NY

Deputy Project Manager for a **Design/Build** contract for the reconstruction of a 1,850-foot-long ramp located south of the Bronx Toll Plaza and merging with the Queensbound Main Line. The scope of work included replacement of the steel superstructure and concrete deck, as well as retrofitting of the existing piers and replacement/strengthening of the pier caps. In addition, the ramp was reconfigured to improve the geometry and strengthened to support HS-25 live load and meet the requirements of the current seismic codes. Mr. Hom was responsible for coordination of work between various disciplines, management of subconsultants and leading the design team to meet the demanding project schedule. Other responsibilities included progress reporting to TBTA and assisting the contractor is **resolving field problems and constructability issues**. (2013 – 2014)

TBTA HENRY HUDSON BRIDGE REHABILITATION CONSTRUCTION MANAGEMENT SERVICES, NEW YORK, NY

Construction Manager responsible for the construction management and construction inspections services for a \$36 million rehabilitation involving removal of the upper level curb stringers and replacement of the roadway lighting at the Henry Hudson Bridge. The scope of work included steel and concrete demolition; structural steel repairs/replacement; installation of concrete-filled steel grid deck; concrete parapet construction; lead paint removal and repainting; and upgrade of the electrical distribution system and lighting. The project involved staged construction, 24-hour multi-shift operations and **work over active railroad tracks.** (2010-2014)

PANYNJ BAYONNE BRIDGE STEEL REHABILITATION & PAINTING, NEW YORK, NY

Project Manager responsible for the rehabilitation of the Bayonne Bridge. Work included hands-on inspection and field verification of the necessary steel repairs in order to develop rehabilitation plans for all structures comprising the bridge. The H&H team worked closely with PANYNJ to perform inspections within the strict MPT windows. Work included preparation of an inspection report and developing plans, details and specifications for the repairs and painting. (2010-2013)

JOSEPH GRIFFIN, PE CONSTRUCTABILITY REVIEW

REGISTRATION

Professional Engineer: NJ, NY, PE Professional Planner: NJ

EDUCATION

B.S.C.E., 1976, New Jersey University of Technology

YEARS EXPERIENCE

Total Years: 39

HH Hardesty &Hanover



SUMMARY BIOGRAPHY

Joseph Griffin recently retired as **President of Engineering** and a Director of George Harms Construction Co., Inc. with 37 years of heavy construction experience, 30 of which has been with George Harms Construction Co Inc, Farmingdale, NJ. Mr. Griffin has **supervised and performed design and construction engineering** for a wide-range of heavy construction projects including railroad, highway, bridge, landfill, electrification, cofferdams, sheeting, piles, pipelines, and dams. He has been responsible for overseeing project engineers, schedulers, estimators, designers, cost accountants, and construction supervision.

With Griffen: 6

Upon retiring from George Harms Construction in December 2009, Mr. Griffin established Griffin Engineering, LLC providing engineering services to both Contractor and Consulting Engineering clients. Since December 2009, Mr. Griffin has performed temporary structure designs, estimating, constructability reviews, claims management and construction management functions for numerous clients on numerous heavy construction projects throughout New Jersey and New York.

RELEVANT PROJECT EXPERIENCE

NJDOT, ROUTE 35 VICTORY BRIDGE, PERTH AMBOY, NJ

Constructability Reviewer for the construction of first precast segmental bridge in NJ involving cofferdams, piles, large diameter drilled shafts, post tensioning, and water operations. Two new bridges were constructed and the demolition of the existing bridge was also included. Much of this construction was completed at heights over 80', and across the Raritan River.

NJ TRANSIT EWR MONORAIL NEC CONNECTION, CONTRACT GC-1, NEWARK, NJ

Constructability Reviewer. A project involving foundations, structures, pedestrian platforms, bridges, track bed construction, signal bridges and general site work. The project required the implementation of a Health & Safety Plan, a Quality Control Plan, and requires close coordination with railroad forces. Value engineering design changes were implemented. This project also requires management of an owner supplied insurance program.

NJ TRANSIT SECAUCUS TRANSFER PROJECT, 138KV RELOCATION, SECAUCUS, NJ

Constructability Reviewer. Construction of access roads, foundations, piles, steel poles, and electrical line work. Responsible for implementing a value engineering change. Project also required implementation of a Health & Safety Plan, and Quality Control Plan as well as management of an owner supplied insurance program.

NJDOT ROUTES 295 & 42 / I-76 DIRECT CONNECTION, CAMDEN COUNTY, NJ

Constructability Reviewer for the I-295 NB / SB and Ramp A Bridge Structures. Prepared a constructability report and erection plan for deep curved steel I girder structures and pier cap box beams over extensive traffic. Also prepared a construction cost estimate and staging scheme of erection activities. July 2010 - May 2012

RELEVANT PROJECT EXPERIENCE (CONT.)

PSE&G NUCLEAR DEVELOPMENT PROJECT, CAUSEWAY DESIGN STUDY, SALEM, NJ

Constructability Reviewer for the new mile long access bridge to the Salem Nuclear Power Plant. Performed concept analysis for constructability of various types and prepared construction cost estimates for various alternatives. August & September 2010

WEST BROOK ROAD BRIDGE OVER THE WANAQUE RESERVOIR, PASSAIC COUNTY, NJ

Constructability Reviewer. Prepared a constructability report and construction cost estimate for all major facets of construction and demolition of a deep water, drilled shaft supported, reservoir crossing. July 2011 – April 2012.

NJTP SHOULDER RESTORATION & IMPROVEMENT PROGRAM MP 83 - 100, OCEAN COUNTY, NJ

Constructability Reviewer. Prepared a constructability review of the Phase C Plans, Specifications, for Contracts P200.198, P200.199, P200.200, and P200.201 addressing the difficulties of construction, access, and phasing, for the major components of bridge construction. December 2011 – May 2012

NJTP MAINLINE WIDENING FOR SHOULDER GSP MP 83.5 - 88.5, OCEAN COUNTY, NJ

Constructability Reviewer. Performed a Claims Avoidance Audit of the Phase C Plans, Specifications, Construction Schedule, and Construction Cost Estimate for Contract P200.199 to identify potential areas of concern that could become issues during the construction.

NJDOT ROUTE 1&9(T), ST PAUL'S AVENUE BRIDGE, JERSEY CITY, NJ

Constructability Reviewer. Construction of 11 new bridge and 45 new retaining walls of varying design at Tonelle Circle in Jersey City, NJ. This project includes three bridges built over **active rail lines** and all work performed in an active traffic environment. Construction on the project involved all facets of heavy construction including, pile driving, deep shoring, dewatering, concrete structures, steel erection, drilled shafts, MSE walls, excavation and handling of contaminated materials, road construction, utilities, tunnel shafts, jacked casings, major demolition, and signalization.

ROUTE 52 CAUSEWAY - CONTRACT A1, CITY OF SOMERS POINT AND OCEAN CITY, NJ

Constructability Reviewer. Reconstruction of two low level bridges over the Great Egg Harbor Bay. The new bridge work included twin bridges over two separate waterways, totaling 7,500 LF of bridge. The bridges consist of cast in place concrete pier caps and columns, supported by concrete footings. Footings are founded on 30" square concrete piles, up to 120' long. The superstructure is 93 " tall concrete girders, 135' long, supporting precast concrete deck panels and a high performance concrete deck. Road work included vibro concrete shafts, MSE walls, high strength Geosynthetic reinforcement, Geotechnical monitoring, consolidation waiting periods, steel bulkheads, drainage, utilities and paving. All work took place in an environmentally sensitive area with extensive environmental restrictions.

NJDOT ROUTE 9, SECTION 25K & 1F, WOODBRIDGE/SAYREVILLE, NJ

Constructability Reviewer. Design Build Bridge project over the Raritan River in Woodbridge, NJ. The project involved a great deal of water work, bridge, piles, cofferdams, concrete and steel superstructures as well as road construction.

NJDOT ROUTE 295/195 INTERCHANGE, TRENTON, NJ

Constructability Reviewer. Construction of this complex highway interchange including 2 mil cubic yards of embankment construction, 1 mile of bridges, piles, sheeting, and cofferdams. All work was performed in tidal wetlands and was compliant with Army Corps and NJDEP permits. Public relations and environmental preservation was critical on this project as was staging and scheduling.

NJDOT ROUTE 129, SECTION 10A & 11A, TRENTON, NJ

Constructability Reviewer. Highway and bridge construction including deep-sheeted excavations adjacent to Conrail, concrete walls, and proprietary walls. Implemented and administered a Health & Safety Plan, Soil Re-Use Plan, and the excavation and disposal of hazardous materials. Also implemented value engineering changes.

PETER ROODY, PE TASK MANAGER – MOVABLE BRIDGE

REGISTRATION

Professional Engineer: NY, MD, WA, ME

EDUCATION

B.E.E.S., 1982, Hofstra University

YEARS EXPERIENCE

Total Years: 33

With H&H: 33





SUMMARY BIOGRAPHY

Peter Roody has over 30 years of experience in the design of heavy movable structures. He serves as Hardesty & Hanover's **Chief Structural Engineer for movable bridges**, responsible for developing engineering concepts and the overall technical content and quality of the design.

Mr. Roody is a recognized expect in the field, known for his innovative approach to addressing complex technical problems. **His designs feature many creative solutions to improve the bridge performance, ensure depend-able operations and minimize maintenance requirements**. Notable examples include Amtrak's Niantic River Drawbridge which utilizes separate counterweights integral with each of the main bascule girders to eliminate complexities associated with the overhead catenary system. His other significant railroad projects include the Port River Bridges in Adelaide, Australia, featuring 200-foot long single-leaf bascule spans. Mr. Roody is currently working on a replacement of the Sarah Long Vertical Lift Bridge, which uses many creative solutions, including the first application of post tensioned precast concrete for the lift towers and fenderless piers designed to with-stand vessel impact.

Mr. Roody's experience includes other heavy movable structures, such as cranes, retractable stadium roofs and other complex systems. He has been involved in all phases of the project delivery, including inspections, emergency repairs, rehabilitation, feasibility studies and design of new bridges. His technical acumen and extensive hands-on experience allow him to develop the most efficient solutions, with a **focus on longevity, low maintenance and reliability of movable spans**.

RELEVANT PROJECT EXPERIENCE

SARAH LONG BRIDGE REPLACEMENT, PORTSMOUTH, NH/ KITTERY ME

Deputy Project Manager and Lead Structural Engineer responsible for the design of movable span on a \$159 million replacement of the Sarah Long bridge, which is a vertical-lift bridge carrying vehicular traffic and serving as a **railway link to the Portsmouth Naval Shipyard**. The movable bridge design, developed by Mr. Roody, features **many creative solutions** including the first application of precast post-tensioned concrete for the lift span towers. A single level **300-foot-long lift span**, framed with box girders, has separate seating locations for a double level highway/rail approaches. The operating machinery, which was designed to reduce long term maintenance needs, is located in the tower bases. H&H also designed a state of the art vessel collision system. (2013 - present)

NJ TRANSIT BRIELLE BRIDGE FEASIBILITY STUDY, BRIELLE/POINT PLEASANT, NEW JERSEY

Quality Assurance responsible for the quality oversight of the design of movable span on a feasibility study for the replacement of a 100-year old Scherzer rolling-lift bascule bridge on the NJ Transit Coast Line. H&H is conducting a comprehensive analysis of different track profiles and movable span alternatives, including **vertical lift; rolling lift bascule;** and **trunnion style bascule**. Each alternative has been analyzed with regards to the environmental impacts, flood resiliency, navigational clearances, constructability, maintenance issues, construction cost (including force account), visual impact and other pros and cons. (2014 – present)

PETER ROODY, PE TASK MANAGER – MOVABLE BRIDGE

RELEVANT PROJECT EXPERIENCE (CONT.)

AMTRAK NIANTIC RIVER BRIDGE REPLACEMENT, EAST LYME/WATERFORD, CT

Lead Structural Engineer responsible for the design of movable span on a \$140 million replacement of the Niantic River Drawbridge on Amtrak's Northeast Corridor, which carries 54 trains daily, including Amtrak, ConnDOT's Shore Line East and freight railroad. The project involved off-line replacement of the existing structure. The new 140 ft. long single-leaf bascule span carrying two railroad tracks was constructed 58 feet south of the existing railroad alignment. Mr. Roody developed a unique structural system comprised of separate counterweights integral with each of the main bascule girders in order to eliminate complexities associated with the overhead catenary system during bridge openings. (2008 - 2013)

PORT RIVER BASCULE BRIDGES, ADELAIDE, SOUTH AUSTRALIA

Project Manager for the design of two **new single-leaf bascule bridges** providing **vehicular and rail connection** to port facilities in a busy commercial port in Adelaide, Australia. The design developed by Mr. Roody features creative architectural forms with **200-foot bascule span** framed with steel box girders, shaped to achieve a slender, futuristic look. The span is remotely operated from a control center located 5 km away from the site. The bridge is supported on **"V-Shaped" post tensioned concrete piers**, with geometry complementing the angle of the open bridge. The project was delivered as design/build with Mr. Roody having a full responsibility for the design and management of the movable spans. (2005 - 2008)

JACQUES CHABAN-DELMAS VERTICAL LIFT BRIDGE, BORDEAUX, FRANCE

Quality Control Engineer for the design of a new vertical lift bridge over Garonne River in Bordeaux, France. With its elegant architectural form and the **longest lift span in Europe** (383 ft.), the Chaban-Delmas Bridge is an example of **state-of-the-art engineering**. It has a lift height of 164 ft. and accommodates 320 ft. wide navigational channel. The bridge was designed to carry four lanes of vehicular traffic, two bicycle/pedestrian paths and **two light rail tracks** for a total width of approximately 140 ft. The counterweights and the lift span weight have been finely balanced to achieve maximum efficiency and allow lifting the bridge with very little energy (only two 132 kW motors). (2010-2013)

AMTRAK SPUYTEN DUYVIL SWING BRIDGE EMERGENCY REPAIRS, NEW YORK, NY

Lead Structural Engineer for various emergency repairs of the turn-of-the-century Spuyten Duyvil Swing Bridge, which is a major link in **Amtrak's Empire Corridor**. During its more than 100-year history the Spuyten Duyvil Bridge was repeatedly hit by barges suffering various degrees of damage, including 1982 collision with an oil tanker which rendered the bridge nonoperational for almost a decade. In 1992, H&H was retained to design a major structural/mechanical/electrical rehabilitation to restore the bridge to service. Following that, H&H was involved in emergency repairs of damage caused by a vehicle collision in 2002 and 2003. The emergency repairs included jacking of the 750-ton swing span of the bridge, in both vertical and horizontal direction, to reseat the bridge properly on its structural-mechanical turn-table. All work was completed during nighttime without impact on rail operations. In 2008 H&H also designed a new fender system. (1992 – 2003).

BNSF BALLARD BASCULE BRIDGE, SEATTLE, WASHINGTON

Lead Structural Engineer for the **replacement of the two counterweight trunnion bearings** of the Ballard Strauss Bascule Bridge in Seattle, which carries BNSF railroad. The project involved jacking 5.5 million pounds of the combined weight of the bridge and counterweight to perform the replacement. **The work was time-critical, as field construction coincided with a scheduled channel closure, and it was completed in 14 days**. (2009 – 2010)

MAINE DOT CARLTON VERTICAL-LIFT BRIDGE OVER THE KENNEBEC RIVER, BATH, ME

Lead Structural Engineer responsible for this \$100M project, which included inspection and preliminary design for repair and study for replacement of a combined highway/railroad bridge. Involved mechanical, electrical, and structural systems of this 2,700-feet river crossing. Bridge included a 234-feet rail and highway vertical-lift span that provided a 130-foot vertical navigation clearance. A capacity study led to Hardesty & Hanover performing alternate designs for bridge replacement - a vertical lift with the rail portion nested and a high-level fixed. Repair of the trunnions involved inplace machining and shot peening of the fatigue prone transition fillets. (1995-2001)

DAVID A. GERBER, PE TASK MANAGER – APPROACH SPANS

REGISTRATION

Professional Engineer: NY, NJ

EDUCATION

B.S.C.E., 1989, New Jersey Institute of Technology

YEARS EXPERIENCE

Total Years: 26

With H&H: 25

Hardesty &Hanover



SUMMARY BIOGRAPHY

David Gerber is a **Structural Discipline Leader** with 26 years of design experience focused on transportation and infrastructure projects, including bridges, highways and railroad facilities. He has been **responsible for all phases of the project delivery**, including inspections, scoping, feasibility studies, engineering analyses and design for the rehabilitation or replacement of bridges and other structures.

As the Project Engineer, Mr. Gerber has been **leading design teams in the development of contract documents.** In this capacity he has been responsible for developing engineering approach, evaluating design alternatives and selecting the most appropriate solutions. His responsibilities also include coordination of work between different disciplines and supervision of all engineering and drafting work on the project. Having worked on many bridge projects in the coastal areas, he has **extensive knowledge of the local, state and federal regulatory standards**, including stormwater management, environmental permitting and coordination with the US Coast Guard.

Mr Gerber has successfully **delivered numerous projects to the railroad clients, including Amtrak, NJ Transit, PANY&NJ and Canadian Pacific**. He was also responsible for a **replacement of overgrade bridges** located in congested urban settings, which required extensive coordination with **LIRR**. Through his continuing involvement in railroad projects, Mr. Gerber developed **excellent understanding of the constraints and issues specific to the railroad environment**.

RELEVANT PROJECT EXPERIENCE

NJ TRANSIT BRIELLE BRIDGE FEASIBILITY STUDY, BRIELLE/POINT PLEASANT, NEW JERSEY

Lead Structural Engineer responsible for the design of the approach spans for a feasibility study for the replacement of a 100-year old **bascule bridge on the NJ Transit Coast Line**. H&H is conducting a comprehensive analysis of different track profiles and structural alternatives for the movable span and approaches. Each alternative has been analyzed with regards to the environmental impacts, flood resiliency, navigational clearances, constructability, maintenance issues, construction cost (including force account), visual impact and other pros and cons. The recommended approach span alternative is a multi-girder system with ballast pan. Estimated construction cost \$102 million. (2014 – present)

AMTRAK NIANTIC RIVER BRIDGE REPLACEMENT, EAST LYME/WATERFORD, CT

Lead Structural Engineer for a \$140 million replacement of the Niantic River Drawbridge on **Amtrak's Northeast Corridor, which carries 54 trains daily**, including Amtrak, ConnDOT's Shore Line East commuter rail and freight railroad. The project involved **off-line replacement** of the existing structure. The new **140 ft. long single-leaf bascule span** carrying two railroad tracks was constructed 58 feet south of the existing railroad alignment. Mr. Gerber was responsible for design of the bridge abutments and bearings. (2010 - 2013)

NJT NEWARK DRAWBRIDGE REHABILITATION, NEWARK, NJ

Project Engineer/Structural Lead for the rehabilitation of the Newark Drawbridge on **NJ Transit Morristown Line, which carries 60 trains each way daily**. The work involved structural repairs/strengthening, mechanical/

DAVID A. GERBER, PE TASK MANAGER – APPROACH SPANS

RELEVANT PROJECT EXPERIENCE (CONT.)

electrical systems upgrades and timber ties replacement on the bridge and the adjacent viaducts. Mr. Gerber was responsible for inspection, load ratings, design of structural steel repairs, preparation of contract drawings and cost estimate as well as overall project coordination during design and construction support phases. (2006 – 2010)

TUNKHANNOCK VIADUCT (NICHOLSON BRIDGE), NICHOLSON, PA

Lead Structural Engineer for the inspection and load rating of 2,375 feet long Nicholson Viaduct operated by the **Canadian Pacific Railway**. Built in 1915, the 240 feet high viaduct was the **largest concrete structure in the world** and merited the title of largest concrete bridge in the US for 50 years. In 2006 H&H conducted a detailed inspection and load rating of the structure, and developed rehabilitation options. Mr. Gerber was responsible for generating computer models and performing load rating analysis of main arch ribs and spandrel walls. (2006)

AMTRAK SPUYTEN DUYVIL SWING BRIDGE EMERGENCY REPAIRS, NEW YORK, NY

Structural Engineer responsible for structural design and preparation of contract drawings for the restoration of a **swing span railroad bridge** on Amtrak's Empire Corridor, after bridge suffered displacement from a collision due to errant waterway navigation. **The emergency repairs included jacking of the 750-ton swing span** of the bridge, in both vertical and horizontal direction, to reseat the bridge properly on its structural-mechanical turntable. All work was completed during nighttime without impact on rail operations. (2003).

NYCDOT RECONSTRUCTION OF 2ND AVENUE BRIDGE OVER LIRR, BROOKLYN, NY

Project Engineer for the replacement of 2nd Avenue Bridge in Brooklyn, **spanning over LIRR tracks**. The project involved a complete removal of the existing 264-ft, six-span structure and replacing it with two-span bridge with continuous steel multi-girder superstructure and reinforced concrete substructure. The structural work included design of temporary support system and developing a complex staging plan for construction. Mr. Gerber's responsibilities included overall coordination and supervision of the project personnel including subconsultants. He also developed construction staging approach and coordinated the design with private and public utilities. (2003 – 2006)

NYCDOT RECONSTRUCTION OF 14TH AVENUE BRIDGE OVER LIRR, BROOKLYN, NY

Project Engineer for the replacement of 14th Avenue Bridge in Brooklyn, **spanning over LIRR tracks**. The project involved a complete removal of the existing 120-foot, four-span bridge and design of a new 60-foot single-span bridge with prefabricated superstructure and reinforced concrete substructure. Responsibilities included overall supervision of the design work, utility coordination, obtaining permits and approvals and developing staging approach. (2002 – 2003)

NJ TRANSIT UNDERGRADE BRIDGE INSPECTION – GROUP F, RARITAN AND ATLANTIC CITY RAIL LINES

Team Leader for the **inspection of 13 railroad structures** including the 4,300-foot **Delair Bridge over the Delaware River** in Philadelphia, PA, which carries the **NJ Transit's Atlantic City Line, CSX and NSR**. Built in 1896, the Delair Bridge was converted to a vertical lift in 1958 by H&H and became the longest and heaviest double-track lift bridge in the world at the time. As the team leader, Mr. Gerber was responsible for directing the team in performing in-depth inspection, preparation of reports, and updating the load ratings. (2003 – 2004)

AMTRAK BUSH RIVER BRIDGE, PERRYMAN, MD

Lead Structural Engineer on a project that involved mechanical upgrades to the 40-foot-long, **single-leaf, heel trunnion bascule span** of the Bush Rive Bridge. Built in 1913, the ½-mile long structure is located on the busiest segment for freight trains on the entire Northeast Corridor. The two-track movable span requires extensive ongoing maintenance to maintain service reliability. Mr. Gerber was responsible for the design of new machinery supports, and developing contract drawings, specifications and cost estimate. (2003 - 2004)

AMTRAK/NJT PORTAL BRIDGE, KEARNY/SECAUCUS, NJ

Lead Structural Engineer on a project that involved mechanical upgrades to the **swing span of the Portal Bridge** over Hackensack River on the **Northeast Corridor**, which carries Amtrak and NJ Transit service. The project scope involved installing a new center wedge machinery. Responsible for the design of new machinery supports, and developing contract drawings, specifications and cost estimate. (2003)

RAYMOND MANKBADI, PE TASK MANAGER – FOUNDATIONS & GEOTECH

REGISTRATION

Professional Engineer: NJ, CT, NY, PA

EDUCATION

B.S.C.E., 1978, Cairo University M.S.C.E., 1985, Stevens Institute of Technology

YEARS EXPERIENCE

Total Years: 35

With H&H: 8





SUMMARY BIOGRAPHY

Raymond Mankbadi is the **Director of Geotechnical Engineering** at Hardesty & Hanover. In this capacity, he has been involved in major infrastructure reconstruction projects encompassing all aspects of geotechnical engineering, including: deep foundations; earth retaining structures; slope stabilization; ground improvement; support of excavation; geotechnical instrumentation; underground structures; dam construction; and sanitary landfills.

His experience includes subsurface investigation, geotechnical analysis, groundwater modeling, soil liquefaction, soil dynamics, design of rock anchors, drilled shafts and construction-related services for bridge and highway projects. Mr. Mankbadi was responsible for the geotechnical services on **large scale infrastructure projects** which involved extensive soils, foundation and substructure work such as the \$640 million **Willis Avenue Bridge**, NYC; \$350 million **Route 52 Causeway, NJ**; and \$200 million **Route 1 & 9T over St. Paul's Viaduct, NJ**. He was also involved in many projects along the New Jersey Coastline, including the **Great Egg Harbor Bridge Replacement**, and has a good familiarity with the coastal features and the prevailing geotechnical conditions.

RELEVANT PROJECT EXPERIENCE

NJ TRANSIT BRIELLE BRIDGE REPLACEMENT FEASIBILITY STUDY, BRIELLE/ POINT PLEASANT, NJ

Lead Geotechnical Engineer responsible for geotechnical engineering for the feasibility study for the replacement of a 100-year old Brielle Movable Bridge on the NJ Transit Coast Line. H&H is conducting a comprehensive analysis of different track profiles and structural systems. Each alternative has been analyzed for environmental impacts, flood resiliency, navigational clearances, constructability, maintenance issues, construction cost, visual impact and other pros and cons. The recommended alternative includes simple trunnion bascule bridge. Other recommendations include ground improvement on the approaches using Controlled Modulus Columns (CMC) or Vibro Concrete Columns (VCC).Estimated construction cost \$102 million. (2014 – present)

NJ TURNPIKE AUTHORITY, GARDEN STATE PARKWAY OVER GREAT EGG HARBOR, NJ

Lead Geotechnical Engineer for new bridges crossing Great Egg Harbor and Drag Channel. Responsible for all geotechnical aspects of the design including subsurface investigations, preparation of geotechnical and foundation reports, pile foundation design, soil improvement, reinforcement of embankment on soft soils and geotechnical instrumentation. **Performed Wave Equation, Drivability, and Pile Dynamic Analyses**. (2012 – present)

NYCDOT WILLIS AVENUE BRIDGE REPLACEMENT, NEW YORK, NY

Lead Geotechnical Engineer for the \$640 million off-line replacement of a major 345-foot-long, swing bridge and 3,000 feet of approaches. The scope of geotechnical work included extensive subsurface/subsoil exploration program, development of geotechnical recommendations/report and design of the new bridge foundations, which included drilled shafts, steel H-piles, and mini piles. Responsible for all geotechnical aspects of the project including piles driving, soil improvement, reinforcement of embankments on soft soils and geotechnical instrumentation. (2007 – 2010)

RAYMOND MANKBADI, PE TASK MANAGER – FOUNDATIONS & GEOTECH RELEVANT PROJECT EXPERIENCE (CONT.)

NJDOT ROUTE 1&9T OVER ST. PAUL'S VIADUCT, JERSEY CITY, NJ

Lead Geotechnical Engineer for a \$225 million reconstruction of the St. Paul's Avenue Viaduct and ramp connections with Route 1&9, Route 7, Route 139, and local Jersey City streets. The project replaces the Route 1 & 9T Mainline Viaduct over St. Paul's Avenue with a new structure on a new alignment north of the present structure. The new alignment requires the construction of a new interchange with new approach roadways, which will provide connections to Route 1 & 9T, Route 7, Pulaski Skyway, Rte 139, and local streets in Jersey City. The project scope includes **11 new bridge structures**, **35 retaining walls**, **11 sign structures**, **and 2 catenary structures**. Mr. Mankbadi has been responsible for subsurface exploration program, developing foundation recommendations, geotechnical support to the design of new bridge foundations and retaining walls, and pavement evaluation and design. (2008 - Ongoing)

NJDOT ROUTE 52 CAUSEWAY - SOMERS POINT BRIDGE, SOMERS POINT & OCEAN CITY, NJ

Lead Geotechnical Engineer on a \$350 million bridge replacement project, which involved a design of 2.2-mile-long segmental concrete causeway, to replace four bridges on Route 52 in New Jersey. Responsible for all geotechnical aspects of the construction including pile driving, soil improvement, reinforcement of embankments on soft soils and geotechnical instrumentation. The design featured prestressed concrete piles and installation of Vibro Concrete Columns to improve the compressible soils. (2007 – 2012)

NJDOT ROUTE 36 BRIDGE OVER SHREWSBURY RIVER, SEA BRIGHT & HIGHLANDS, NJ

Lead Geotechnical Engineer for a \$91 million highway improvement and off-line replacement of the existing bascule bridge with a new high-level fixed bridge. H&H's scope of work included design of two pedestrian bridges, geotechnical engineering, design of segmental concrete pier, scour and seismic analyses, and utility relocation. Mr. Mankbadi was **responsible for all foundation design aspects of the project**, including design of 54-inch cylindrical concrete piles, prestressed concrete piles, retaining walls design, as well as settlement analysis and vibration monitoring. (2005-2008)

NJ TRANSIT ROEBLING EMBANKMENT FAILURE, NJT RIVER LINE, NJ

Lead Geotechnical Engineer for emergency repairs to 300 ft. long section of 55 ft. high embankment between the Roebling and Bordertown NJ Transit stations, which collapsed as a result of Hurricane Irene causing disruptions to rail operations. The work involved fast track investigation, testing, design and construction - all of these activities to be completed within a six month period. Due to severe site constraints, the new retaining walls were supported on piles and drilled shafts. The key design and construction issues included minimizing vibrations during pile installation to prevent further slope failure. In order to address that, steel HP piles were placed in pre-drilled concrete grouted shafts. The design featured a new drainage system, including bio-swales. Other work included design of construction access and temporary work platforms consisting of mechanically stabilized earth walls. (2011 – 2012)

NJDOT ROUTE 1 OVER CONRAIL, NJ

Lead Geotechnical Engineer responsible for the final design of the bridge foundations, retaining walls, and pavement design for a three-mile section of Route 1. Work involved subsurface exploration program, preparation of geotechnical report, and foundation design. The project utilized T-Wall retaining wall system for the construction of bridge approaches.

NJ TRANSIT SOUTHERN NEW JERSEY LIGHT RAIL SYSTEM

Lead Geotechnical Engineer for the design of the Southern New Jersey Light Rail Transit System which operates with 20 station stops between the Waterfront Entertainment Center in Camden and the Trenton Train Station. The project scope involved a design 34-mile alignment which included 24 railroad bridges – 11 new, 10 rehabilitated and 3 with superstructure replacement. Responsible for supervising the geotechnical evaluation and foundation design for all bridges and 15 stations. **Surcharge and wick drains were utilized to accelerate settlement**.

DAVID A. HOWELL, PE TASK MANAGER – RAIL SYSTEMS



REGISTRATION

Professional Engineer: NY, FL e-RAILSAFE Badge: e-VERIFILE.COM, Inc.

EDUCATION

B.S.C.E., 1969, Rutgers, The State University of New Jersey

YEARS EXPERIENCE

Total Years: 45

With Gannett Fleming: 22



SUMMARY BIOGRAPHY

David A. Howell is a *Senior Project Manager* with Gannett Fleming's Rail and Transit Systems group responsible for railroad and highway design projects including studies, construction documents, drainage, utilities, right-of-way, and permits as well as design services during construction. Mr. Howell has significant experience with the design and management of new rail systems projects. His experience comprises major rail projects including: the **Portal Bridge Capacity Enhancement** for NJ Transit; **Northern Branch Corridor** for NJ Transit; and the **Connecticut River Bridge** project for Amtrak.

RELEVANT PROJECT EXPERIENCE

PORTAL BRIDGE CAPACITY ENHANCEMENTS, HUDSON COUNTY, NJ

Deputy Project Manager for the final engineering for 2.5 miles of the **Amtrak Northeast Corridor** between Newark, New Jersey, and New York City. Coordinated the efforts of the tri-venture firms and 27 subconsultants in redesigning the most heavily travelled corridor in the country, carrying both **Amtrak's high-speed intercity service and NJ Transit's commuter service**. The project involves replacing the two-track movable railroad bridge with a fixed bridge over the Hackensack River. The enhancements include the design of bridges and related civil, track, signal, catenary, electric traction switching substation, wetland mitigation, and contaminated sites in the environmentally sensitive Hackensack Meadowlands.

AMTRAK SAWTOOTH BRIDGES REPLACEMENT AND EXPANSION PROJECT, HARRISON, NJ

Deputy Project Manager responsible for the preparation of a conceptual design report for two aging, heavily used bridges along the Northeast Corridor (NEC) traversing over four New Jersey Transit mainline tracks, a Conrail freight track, and the Port Authority Trans-Hudson main line. Referred to as the Sawtooth Bridges, the structures are integral to the capacity of the NEC for rail traffic. Replacement of the two-track bridges and expansion of the structures to carry four tracks will improve the long-term serviceability of the NEC and support strategic growth of intercity and local/commuter rail traffic. In addition, a site inspection and conditions survey report were also performed. The alternatives analysis concept designs identified the type, size, and location of new railroad bridge structures providing four-track capacity; identified construction strategies and constructability issues to enable completion of the project while maintaining railroad operations; and provided Amtrak with conceptual design information, costs, and a schedule to progress the design in subsequent project phases.

CONNECTICUT RIVER BRIDGE REPLACEMENT PROJECT, OLD SAYBROOK, CT

Project Manager for support services provided to another firm in the preparation of the environmental assessment to meet the National Environmental Policy Act requirements. The project was for replacement of the more than 100-year-old existing Connecticut River Bridge. The bridge has 10 spans, including a 160-foot-long rolling lift bascule span. Alternatives considered included both **vertical lift and bascule spans**. Services included revisions to the alternatives being considered to avoid or mitigate identified adverse impacts and in response to comments by various agencies. This included the areas of **track alignment design, catenary, signals, communications, structures, and geotechnical engineering**. Modifications to the alternatives considered cost, constructability, operations, and impacts on the environment. Issues considered included minimizing disruption to the Northeast Corridor, meeting the long-term needs of Amtrak, improving safety, and balancing benefits and cost.

RELEVANT PROJECT EXPERIENCE (CONT.)

NORTHERN BRANCH CORRIDOR, BERGEN COUNTY, NJ

Project Manager responsibilities in 2008 for the design of an 11-mile extension of the Hudson-Bergen light rail system from North Bergen to Tenafly. Alternatives are for light rail transit or diesel multiple unit trains. There will be nine stations along the corridor, most with either at-grade parking or parking structures. The corridor shares right-of-way with the CXST Northern Branch as well as the New York Susquehanna and Western Railroad. Four undergrade bridges will be reconstructed and 85th Street will be extended, which requires a new bridge under the CSXT River Line. The project includes several viaducts carrying the transit line over CSXT tracks. Responsible for mitigating impacts to wetlands, floodways, and adjacent properties. Design includes operations, track, structural, communication and signal, and electric traction. Construction staging and duration for various design options are critical for this time-sensitive project.

GENERAL ENGINEERING CONSULTANT (GEC) CONTRACTS, VARIOUS LOCATIONS

Project Manager for numerous Amtrak GEC contracts. Services have included 200 tasks encompassing a variety of services, including electric traction, signals, yards, and drainage improvements. For the Northeast Corridor (NEC) Improvements contract (1995 to 2000), served as Project Engineer for various tasks in connection with improvements to the NEC for the electrification between New Haven and Boston. Tasks included main line horizontal and vertical track realignment, overhead and undergrade bridge reconstruction, and new siding designs. Services required coordination with the various Amtrak departments.

NEW ALL ABOARD FLORIDA RAILWAY, SECTION PE03, COCOA BEACH, FL

Lead Track Engineer responsible for the track design of 14.4 miles of new, high-speed double track between Cocoa Beach and Orlando, Florida, as part of the All Aboard Florida project. All Aboard Florida is a new, privately owned, operated, and maintained intercity passenger rail service owned by Florida East Coast Industries. The passenger line will run from Miami to Orlando, with future expansion to Tampa. Section PE03 runs from Cocoa Beach westward for 14.4 miles from U.S. Route 1 to S.R. 520 and parallels S.R. 528. The design includes horizontal and vertical alignment for a maximum speed of 125 mph, a 32.75-mph high-speed turnout, typical track sections, typical track details, cross sections, and creation of a proposed digital terrain model to be included in a design-build package. Since the new track would be constructed within Florida Department of Transportation right-of-way along S.R. 528, the work has included extensive coordination with highway, drainage, geotechnical, structures, and utility relocation disciplines. The proposed route includes 13 railroad bridges and an underpass below the highway.

TRACK 7 DESIGN, PROVIDENCE, RI

Project Manager for the preliminary and final design of track improvements for doublestack freight operations on a third track adjacent to the main line. The project involved reconstructing undergrade bridges and modifying the alignment and profile for 6 miles of track, including changes to three interlockings on the main line. The track profile was lowered to provide vertical clearance for doublestack freight operations and there were utility relocations and asbestos removal.

FREIGHT RAIL IMPROVEMENT PROJECT, DAVISVILLE TO PROVIDENCE, RI

Project Manager for design review services for 16 miles of doublestack freight operations along Amtrak's Northeast Corridor, including operations on 11 miles of new track adjacent to the main line and 5 miles of operation on the main line. Designs included new track construction, interlocking reconfigurations, undergrade and overhead bridges, and drainage improvements. Responsible for design reviews, alternative analyses, Primavera scheduling, and cost estimating.

NORTHEAST CORRIDOR IMPROVEMENTS, RI

Project Engineer for various tasks under a general engineering consultant contract with Amtrak for services in connection with improvements to the Northeast Corridor for the electrification project between New Haven and Boston. Tasks included mainline horizontal and vertical track realignment, overhead and undergrade bridge reconstruction, and new siding designs. Services required coordination with the various Amtrak departments including Track, Structures, Communication and Signals, and Electric Traction.

THIRD TRACK PRELIMINARY DESIGN, DAVISVILLE TO ATWELLS, RI

Project Engineer for a feasibility study to determine the preferred location for a freight track adjacent to 16 miles of Amtrak main line. The study took into account impacts on the environment, wetlands, and right-of-way. Constructability issues and project costs were also evaluated.

ROBERT B. MATTHEWS, PE TASK MANAGER – CIVIL ENGINEERING



REGISTRATION

Professional Engineer: NJ

EDUCATION

B.S.C.E., 1997, Rutgers, The State University of New Jersey

YEARS EXPERIENCE

Total Years: 19

With Gannett Fleming: 19



SUMMARY BIOGRAPHY

Robert B. Matthews is a **Department Manager/Civil Engineer** with Gannett Fleming responsible for the management, design, planning, and coordination of transportation projects. Specializes in geometrics, grading, roadside safety, roadway drainage, utilities, construction cost estimates, permitting, earthwork calculations, stormwater drainage basins, and soil erosion and sediment control calculations.

RELEVANT PROJECT EXPERIENCE

GARDEN STATE PARKWAY WIDENING INTERCHANGE 30 TO 63, ATLANTIC/BURLINGTON COUNTIES, NJ

Project Manager responsible for the design of approximately 2.5 miles of roadway widening on the Garden State Parkway. The project also includes the reconstruction of shoulders, a drainage system, two interchanges, and two overpass structures with associated retaining walls. Geotechnical ground improvement measures are required to eliminate future settlements of the widened embankment and existing roadway. This project also requires close coordination with the designer of the Mullica River Bridge project (within this project's milepost limits), two adjacent section designers, the program environmental consultant, and the program management team for environmental compliance, design, and construction consistency.

NJ TURNPIKE INTERCHANGE 6 TO 9 WIDENING PROGRAM, BURLINGTON/MERCER COUNTIES, NJ

Project Manager responsible for overseeing the development and implementation of the project scope, schedule, and budget; providing overall design coordination services; designing horizontal and vertical geometry; developing traffic control and staging plans, drainage plans, and related documents; and preparing construction documents for this section of the program, which extends from approximately Milepost (MP) 56.5 to MP 59.7, a total of 3.2 miles. This section includes normal turnpike widening with 26-foot medians in the vicinity of the Maintenance District 3 facility, in addition to the ramp connections and mainline widening necessary for connections to Service Areas 6N and 6S. The northern terminus of this section for Interchange 7A. The preliminary construction cost estimate is \$200 million.

NJTA I-78 & GSP INTERCHANGE 142 IMPROVEMENTS, ESSEX & UNION COUNTIES, NJ

Deputy Project Manager and Roadway Design Team Leader for the preliminary and final design of this \$125 million interchange improvement project, which involves the implementation of new ramp connections from the Garden State Parkway southbound to I-78 eastbound and from Garden State Parkway northbound to I-78 westbound. **Responsible for the development of Construction Plans, Engineering Estimate, and specifications using Trans-Port and developing a Primavera schedule**, as well as overall design coordination services. **Directed geometric design of highways and streets**, horizontal and vertical design, highway sections design, and design exceptions. Managed the utility engineering effort consisting of utility relocation and coordination with 12 utility companies (including Conrail) resulting in \$2 million of relocation work; performed utility engineering coordination; **prepared Traffic Control and Staging Plans (MPT)**, drainage plans and reports, **Traffic Signage and Striping Plans**, and ROW plans and related documents. **Prepared a Design Exception Report** consisting of three controlling design elements. All design activities utilized InRoads and Microstation CADD techniques and were in accordance with the NJDOT Capital Project Delivery Process, as well as NJDOT/AASHTO.

ROBERT B. MATTHEWS, PE TASK MANAGER – CIVIL ENGINEERING

RELEVANT PROJECT EXPERIENCE (CONT.)

NJDOT ROUTE 18 EXTENSION - SECTION 3A, PISCATAWAY TOWNSHIP, NJ

Deputy Project Manager and Roadway Design Team Leader for the preliminary engineering, final design, and final scope-development for the extension of Route 18 from Section 2A terminus at Hoes Lane to I-287 in Piscataway Township. This \$29 million project includes the widening and rehabilitation of 2.5 miles of land service highway, along with improvements for 20 at-grade intersections with one bridge superstructure replacement, two new bridges, one bridge widening/deck replacement over the Ambrose Brook, and four retaining walls. It also includes over four miles of bikeway and multi-use path (MUP) design; extensive local roadway, driveway, and parking lot improvements; hydraulic analyses; drainage improvements; 8 traffic signals; 110 lighting standards; and ROW documents for 45 parcels. Responsibilities included management and oversight of the horizontal and vertical geometric design of highways and streets, highway section design, Design Exceptions Report preparation using NJDOT Design Exception Manual, preparation of Traffic Control and Staging Plans (MPT), Traffic Signage and Striping Plans, and SYNCHRO corridor simulation. Performed a physical deficiency assessment of existing transportation infrastructure. Managed the utility engineering effort consisting of utility relocation and coordination with 12 utility companies resulting in \$5.5 million of relocation work. Analyzed impacts and coordinated preparation of Access Cut Outs and Plans for 32 driveways in accordance with the NJ State Highway Access Management Code. Also responsible for the development of Construction Plans, Engineering Estimate, and Specifications using Trans-Port and developed a Primavera schedule. All design activities utilized InRoads and Microstation CADD techniques and were in accordance with the NJDOT Capital Project Delivery Process, as well as the NJDOT/AASHTO Roadway Design Manuals, NJDOT Standards Specifications for Road & Bridge Construction, and the NJDOT Procedures Manual.

NJDOT ROUTE 18 – SECTIONS 2F, 7E & 11H, NEW BRUNSWICK TOWNSHIP, NJ

Roadway Design Team Leader for the accelerated preliminary and final design and construction support services for this \$145 million multi-interchange project involving the total reconstruction and widening of 2.1 miles of Route 18. This project included four new interchanges with expressway lanes incorporated to complement northbound and southbound collector-distributor roadways, four new highway bridges, four new pedestrian bridges, one pedestrian tunnel replacement, one new culvert, 27 retaining walls, seven noise walls, 16 new sign structures, one bulkhead rehabilitation, eight new or upgraded traffic signals, an extensive intelligent transportation system, and substantial utility relocations. Responsible for overall design coordination, identification of physical deficiencies in the existing roadway network, geometric design of highways and streets, horizontal and vertical design, preparation of highway sections and a Design Exception Report, Traffic Control and Staging Plans (MPT), utility coordination and design, Traffic Signage and Striping Plan, drainage, ROW engineering, and the preparation of construction documents for preliminary and final design. Managed the utility engineering effort consisting of utility relocation and coordination with 13 utility companies resulting in \$10 million of relocation work. Analyzed impacts and coordinated preparation of Access Cut Outs and Plans for driveways in accordance with the NJ State Highway Access Management Code. Performed conceptual alternatives to address the project need during final scope development (concept development). Developed photo simulation overlays of proposed alternatives over existing photos to visually present interchange alternatives to community groups. The project was developed through an intensive context-sensitive design approach that included regular community partnering meetings and public outreach efforts. Developed an innovative solution to temporary traffic control in lieu of a temporary traffic signal by introducing improved operational characteristics and a roundabout that may be implemented as a permanent solution. Also responsible for the development of Construction Plans, Engineering Estimates, and specifications. Prepared a Primavera schedule. All design activities utilized InRoads and Microstation CADD techniques and were in accordance with the NJDOT Capital Project Delivery Process, as well as NJDOT/AASHTO Roadway Design Manual & NJ Access Code, NJDOT Standards Specifications for Road & Bridge Construction, and the NJDOT Procedures Manual. The project final design was completed on an accelerated schedule of only five months.

NEW JERSEY TURNPIKE INTERCHANGE 14A IMPROVEMENTS, BAYONNE AND JERSEY CITY, NJ

Design Manager for final design for improvements to the Turnpike at Interchange 14A. This interchange connects NJ 440, Port Jersey Boulevard, and the local Bayonne street network with the Turnpike Hudson County Extension. **Responsible for development of construction plans, engineering estimate, and NJDOT supplemental specifications and developing a Primavera Construction Schedule. Prepared Traffic Control and Staging Plans (MPT), Traffic Signage and Striping Plans, a Design Exception Report and Performed Geometric Design of Highway and Streets.**

GLEN E. SCHETELICH, PE TASK MANAGER – PERMIT SUPPORT

REGISTRATION

Professional Engineer: NJ, NY, CT, FL

EDUCATION

B.S.C.E., 1983, Old Dominion University M.S.C.E., 1993, New Jersey Institute of Technology

YEARS EXPERIENCE

Total Years: 32

Hardesty &Hanover



SUMMARY BIOGRAPHY

Glen Schetelich is a **Principal** at Hardesty & Hanover with over 30 years of **design and management experience** in bridge rehabilitation and replacement on high profile rail and highway infrastructure improvement projects. He has been responsible for all phases of project delivery, including inspections, load rating, analysis, alternative development, feasibility studies, preliminary and final design, agency coordination/permitting and preparation of comprehensive contract documents. He has supervised design and **obtained approvals for numerous bridge and highway improvement projects located in New Jersey coastal areas**, which involved complex utility relocations, MPT, contaminated soils, navigational issues, historic preservation and wetlands permitting.

With H&H: 25

Mr. Schetelich has excellent knowledge of the local, state regulatory processes and federal requirements, including environmental permitting and coast guard coordination. He has been working extensively with the local agencies and developed strong relationships with various stakeholders on transportation projects in Southern New Jersey, including NJDOT, NJDEP, USCG, EPA, SHPO and others. He is currently managing the interagency coordination process on NJ Transit's feasibility study for Brielle Bridge replacement. He also managed NJ Transit Task Order Contract which involved preparation of Categorical Exclusion Documents and historic preservation issues.

RELEVANT PROJECT EXPERIENCE

NJ TRANSIT BRIELLE BRIDGE REPLACEMENT FEASIBILITY STUDY, BRIELLE/POINT PLEASANT, NJ

Principal-in-Charge for a feasibility study to replace a 100-year old Brielle **Movable Bridge on the NJ Transit Coast Line**. H&H is conducting a comprehensive analysis of different track profiles and structural systems for the movable span and approaches. Each alternative has been analyzed with regards to the **environmental impacts**, **flood resiliency, navigational clearances, constructability, maintenance issues**, construction cost (including force account), visual impact and other pros and cons. The key issues include coordination with SHPO; agency approvals/permitting; low vertical clearance and substandard channel width (48 feet). Mr. Schetelich is responsible for interagency coordination. (2014 – present)

NJTA GARDEN STATE PARKWAY OVER GREAT EGG HARBOR, NJ

Project Manager for a **\$200M replacement of 47-span, 3,671-foot-long bridge** over Great Egg Harbor Bay and a new 800-foot bridge over Drag Channel. The project also involves roadway improvements across Drag Island and deforestation/ reforestation of approximately 2 acres of land. The new structures feature multi-use pathways with fishing bumpouts. Key issues involved staging of construction within the constraints of **ecologically complex and environmentally-sensitive area**. In-water work is restricted to protect essential fish habitats and anadromous fish runs. Sound, vibrations, and pressures from pile driving and blasting operations have to be mitigated to prevent damage to the marine wildlife and tree clearing is limited to the springtime to protect the habitat of the migratory bird species. The project involved **extensive permitting and agency coordination, including USACE and USCG permits and NJDEP Coastal and Freshwater Permits and Reforestation Act**. (2012 – present)

GLEN E. SCHETELICH, PE TASK MANAGER – PERMIT SUPPORT

RELEVANT PROJECT EXPERIENCE (CONT.)

NJTA RUMSON ROAD BRIDGE OVER THE SHREWSBURY RIVER, RUMSON/SEA BRIGHT, NJ

Principal-In-Charge for a feasibility study and design for the replacement of **double-leaf bascule bridge**. Studied various replacement and rehabilitation options with a focus on maintaining the bridge open to vehicular, pedestrian, and navigational traffic. Off-line, partial off-line, and on-line replacement options were considered. Following the study, developed a preliminary design for the preferred option: off-line, double leaf bascule bridge, 110ft trunnion-to-trunnion. The work involved developing **environmental documentation for the bridge replacement**. (2011 – present)

NJ TRANSIT ROEBLING EMBANKMENT FAILURE, NJT RIVER LINE, NJ

Principal-in-Charge for emergency repairs to 300 long section of 55 ft. high embankment between the Roebling and Bordertown NJ Transit stations, which collapsed as a result of **hurricane Irene** causing disruptions to rail operations. The work involved fast track investigation, testing, design and construction - all of these activities to be completed within a six month period. The key issues included minimizing vibrations during pile installation to prevent further slope failure. In order to address that, steel HP piles were placed in pre-drilled concrete grouted shafts. The design featured a new drainage system, including bio-swales. (2011 – 2012)

OCEANIC BRIDGE OVER NAVESINK RIVER, RUMSON, NJ

Principal-In-Charge responsible for overseeing in-depth inspection, structural ratings, prioritizing the repairs and development of rehabilitation plans for a **double-leaf bascule bridge** located between Rumson and Middletown in New Jersey. The work involved structural, mechanical and electrical repairs. Responsible for the overall supervision of the design team, obtaining permits and approvals, coordination with the client and overseeing the subconsultants. (2009 – 2013)

NJDOT ROUTE 36 BRIDGE OVER THE SHREWSBURY RIVER, MONMOUTH COUNTY, NJ

Principal-in-Charge for \$125M replacement of an existing Route 36 bascule bridge over the Shrewsbury River with a high-level, fixed bridge. Project included highway approach reconstruction and design of two pedestrian bridges to allow safe passage to the beaches without having to cross an active roadway. In addition, a new toll plaza was constructed for the Sandy Hook Gateway National Recreational area, which is located at the northeast limit of the project. **The project involved extensive community outreach and environmental permitting** to secure necessary approvals. Substructure design involved precast cofferdams and precast and post tensioned segmental pier construction. (2005 – 2010)

NJDOT ROUTE 9 OVER BASS RIVER, NEW GRETNA, NJ

Project Engineer for the replacement of this historic bridge. The project involved study for on- and off-line alternatives and preliminary and final design of a new, low-level, fixed bridge that replaced a bascule bridge. Work included **Historic Bridge Alternative Analysis and NJDEP CAFRA**, **Waterfront Development**, and **Freshwater Wetland permits**. The environmental impacts and right-of-way takings were kept to a minimum. Wetland impacts were mitigated through add-ing 0.63 acres of new wetlands in the old roadway bed. Future **maintenance was significantly reduced** through the use of new materials and techniques. A video documentary was prepared as **historic mitigation**. (1995 – 2004)

NJ TRANSIT TASK ORDER CONTRACT FOR BRIDGE & RAILWAY ENGINEERING, NJ

Project Manager for NJ Transit task order bridge and railway engineering contract. The firm's work included structural rehabilitation and movable bridge electrical and mechanical systems upgrades; evaluation and load ratings and permit preparation. Notable assignments included design of an auxiliary drive system for the **Raritan River Swing Bridge**, and repairs of the center wedges. Also, performed replacement design of two bridges along the Atlantic City Rail Line. Work included preparation of **Categorical Exclusion Document and historic preservation issues**. (1999 – 2002)

NJ TRANSIT MOVABLE BRIDGES INSPECTION, NJ

Project Manager for the in-depth inspection of three New Jersey Transit movable bridges. Structures included the **Newark Drawbridge**, a 220-foot-long swing span; the **Lower Hackensack Bridge**, a 200-foot-long vertical lift; and the **Raritan River Drawbridge**, a 330-foot-long swing span. (2002)

MICHAEL D. HAWKINS, PE DISCIPLINE LEAD – MOVABLE BRIDGE STRUCTURAL

REGISTRATION

Professional Engineer: CT, NY, ME, NH, DE, MA, TX

EDUCATION

B.S.C.E., 1988, Bucknell University

YEARS EXPERIENCE

Total Years: 27

HH Hardesty &Hanover



SUMMARY BIOGRAPHY

Michael Hawkins has over 27 years of **technical and management** experience in bridge rehabilitation and replacement on high profile rail and highway infrastructure improvement projects. He has been responsible for all phases of the design work, including inspections, load rating, analysis, alternative development, feasibility studies, preliminary and final design, and peer reviews.

With H&H: 25

Throughout his career, Mr. Hawkins delivered many complex railroad bridge rehabilitation and replacement projects to Amtrak, Metro-North, ConnDOT and other railroad clients. His notable work includes the replacement of the Niantic River and PECK Bridges on Amtrak's Northeast Corridor (NEC) and feasibility study for the replacement of the Connecticut River and WALK Bridges. Mr. Hawkins is currently managing the design of \$159 million replacement of the Sarah Long Vertical Lift Bridge, which carries vehicular traffic and freight rail between New Hampshire and Maine. He is also responsible for peer and constructability reviews on \$465 million replacement of the WALK Bridge, focused on serviceability of the movable span and staging of construction to minimize the impacts on rail operations.

RELEVANT PROJECT EXPERIENCE

SARAH LONG BRIDGE REPLACEMENT, PORTSMOUTH, NH/ KITTERY ME

Project Manager for a \$159 million replacement of the Sarah Long Bridge, which carries vehicular traffic between New Hampshire and Maine and serves as a **railway link** to the Portsmouth Naval Shipyard. The movable bridge design features many creative solutions including the first application of precast post-tensioned concrete for the lift span towers. A single level 300-foot-long lift span, framed with box girders, has separate seating locations for the double level highway/rail approaches. The operating machinery was designed to reduce long term maintenance needs. Also, designed a state of the art vessel collision system. (2010 - present)

CONNDOT/METRO-NORTH NORWALK RIVER (WALK) BRIDGE REPLACEMENT, NORWALK, CT

Project Manager for **peer and constructability reviews** for the \$465 million replacement of the WALK Bridge on Northeast Corridor/Metro-North New Haven Line, which will be procured using Construction Manager/General Contractor (CMGC) delivery method. H&H's role during this stage is to assist ConnDOT project team by providing reviews to examine the serviceability of the new movable bridge, construction staging and phasing, fabrication and erection methods, maintenance and protection of railroad operations, construction access, and the need for temporary construction necessary to address the operational and safety concerns. (2014 - ongoing)

AMTRAK NIANTIC RIVER BRIDGE REPLACEMENT, EAST LYME/WATERFORD, CT

Deputy Project Manager for construction support services for the \$140 million replacement of the Niantic River Railroad Bridge on Amtrak's Northeast Corridor, carrying **54 trains daily, including Amtrak, Shore Line East and freight rail**. The project involved off-line bridge replacement with a two-track electrified bascule span, realignment of the track along the west and east approaches, embankment and retaining wall construction, scour protection, and electrification/signaling for the new alignment. The entire project length was approximately one mile. The design and construction staging was focused on minimizing impacts on railroad operations and the

MICHAEL D. HAWKINS, PE DISCIPLINE LEAD – MOVABLE BRIDGE STRUCTURAL RELEVANT PROJECT EXPERIENCE (CONT.)

adjacent wetlands. Responsible for the review of contractor's submittals, responses to RFI and assistance with resolving field issues. (2004 - 2008)

AMTRAK CONNECTICUT RIVER BRIDGE FEASIBILITY STUDY, OLD SAYBROOK, CT

Deputy Project Manager for a **feasibility study** and conceptual design for the **replacement/rehabilitation of more than 100-year old railroad bridge** spanning the Connecticut River in Saybrook, CT. The Connecticut River Bridge is a ten-span structure consisting of seven thru-truss spans, two deck girder spans and one thru-truss bascule lift span. The first phase of this project included a detailed field inspection and preparation of Condition Inspection Report. The second phase involved **Alternatives Study which evaluated various replacement /rehabilitation options**. The alternatives were compared with regards to the impact on operations, cost and duration of construction, service life, maintenance requirements, environmental impacts, ROW impacts, constructability and safety. (2006 – 2007)

CONNDOT REPLACEMENT OF TOMLINSON BRIDGE OVER QUINNIPIAC RIVER, NEW HAVEN, CT

Project Engineer/Manager for \$120 million replacement of a double-leaf bascule with a new 270-foot-long, vertical-lift span which carries highway and railroad traffic over the Quinnipiac River. H&H performed a comprehensive feasibility study of bridge replacement alternatives focused on maintaining vehicular and railroad traffic during construction. In order to prevent service disruptions, a temporary bridge was built on adjacent alignment. The 930-ft long replacement structure consists of the approaches and a 270-foot tower drive lift span over a 240-foot-wide navigation channel. The lift span is the heaviest designed by H&H to date, weighing over 6.4 million pounds. (1997 – 2002)

AMTRAK WINSOR LOCKS BRIDGE - INSPECTION & RATING, WINDSOR LOCKS, CT

Senior Structural Engineer responsible for oversight of the inspection and preparation of report for this Amtrak project, which involved inspection and load rating of the Windsor Locks Bridge over the Connecticut River. The bridge is a 1,516-foot long, two-track, 17-span deck girder and thru-truss steel bridge supported on stone masonry piers. (2010)

AMTRAK BRIDGE NO. 90.60 OVER THE EAST RIVER - SUBSTRUCTURE REHABILITATION, GUILFORD, CT

Project Manager for the substructure rehabilitation design. The project involved site investigation, design services and environmental permitting for the rehabilitation of the substructure and piles of the existing two-track, ballasted deck concrete railroad bridge. (2007 – 2008)

AMTRAK PEQUONNOCK RIVER (PECK) BRIDGE REPLACEMENT, BRIDGEPORT, CT

Project Engineer for the replacement of PECK Drawbridge and Bridgeport Viaduct in Bridgeport, CT, which is a **vi-tal link on the Metro-North New Haven Line and Amtrak's Northeast Corridor**. The new bridge is a 138-foot twin single-leaf trunnion bascule span. Fixed bridge portions consist of closed-deck, ballast-filled spans that replace the open timber decks of the existing structure. Key challenges included **coordination with the underground utilities, overhead power lines, catenaries and signals**. Also, a special study of the existing foundations was required since the substructure of the bridge experienced significant horizontal movement during its long lifespan. (1994 – 1998)

CONNDOT/METRO-NORTH NORWALK RIVER (WALK) BRIDGE, NORWALK, CT

Project Engineer for the inspection and **Engineering Feasibility and Economic Analysis Study** for the future **mainte-nance and serviceability** of a 100-year old, 564-foot-long bridge with 200-foot-long rim bearing swing span and three approach spans. Built in1896, the bridge carries **four railroad lines** over tidal waterway. The study included analysis and preliminary engineering for the rehabilitation and replacement alternatives, a constructability review of the presented options, as well as the construction cost and life cycle cost comparisons. (1999 – 2000)

CONNDOT MIDDLETOWN RAILROAD BRIDGE REHABILITATION, MIDDLETOWN, CT

Project Engineer for the rehabilitation of the Middletown **Swing Railroad Bridge**, which involved a replacement of center bearing and balance wheels. Project included in-depth inspection, load ratings, feasibility studies, and structural and fender repairs of a 300-foot, **single-track swing span**; four, 200-foot through truss approach spans; and a 60-foot through girder span. (1994 - 1995)

STEPHEN A. MIKUCKI, PE DISCIPLINE LEAD – MOVABLE BRIDGE MECHANICAL

REGISTRATION

Professional Engineer: CT, MD

EDUCATION

B.E.M.S., 1990, Manhattan College

YEARS EXPERIENCE

Total Years: 25

HH Hardesty &Hanover



SUMMARY BIOGRAPHY

Steven Mikucki has 25 years of design and management experience in mechanical engineering with a focus on movable bridge design and rehabilitation. He leads Hardesty & Hanover's Mechanical Department and serves as the **Technical Director of Movable Structures**. In this capacity is responsible for the overall technical content and quality of the design, from concept development through construction.

With H&H: 25

Mr. Mikucki has been responsible for all phases of the project delivery, including field investigation and evaluation of the existing mechanical systems, feasibility studies for replacement, development of detailed drawings and specifications and inspections of the work installed by the contractor. **His notable projects include the new Tomlinson Vertical Lift Bridge, which has the heaviest lift span in the Northeast; the \$600 million Willis Avenue Swing Bridge and the signature Woodrow Wilson Bridge**, which features twin 220-foot long double lead bascule spans. Most recently, Mr. Mikucki has been managing counterweight rope replacement contract on the Metro-North Harlem River Lift Bridge, which has been done while maintaining full train service on the bridge (750 trains per day).

Mr Mikucky is a recognized industry leader actively involved in the work of trade organizations dedicated to the design and maintenance of movable structures. He is the current **Chairman of the AREMA Movable Bridge Subcommittee (Committee 15)** and also the **Chairman of Heavy Movable Structures**. Throughout his career, Mr. Mikucki delivered many successful movable bridge rehabilitation and replacement projects to the local and national railroads, including **Amrtak, Metro-North, NJ Transit, Conrail, BNSF, CP, CN** and others. His experience also includes design of other movable structures, such as bridge travelers and retractable roof systems.

RELEVANT PROJECT EXPERIENCE

NJ TRANSIT BRIELLE BRIDGE FEASIBILITY STUDY, BRIELLE/POINT PLEASANT, NEW JERSEY

Lead Mechanical Engineer for the movable span on a feasibility study for the replacement of a 100-year old Scherzer rolling-lift bascule bridge on the NJ Transit Coast Line. H&H analyzed different movable span alternatives, including **vertical-lift; rolling lift bascule**; and **trunnion style bascule**. Each alternative has been analyzed with regards to the navigational clearances, constructability, maintenance issues, construction cost (including force account), visual impact and other pros and cons. The recommended movable span alternative is a **simple trunnion bascule** with alternative machinery layout. Estimated construction cost \$102 million. (2014 – present)

METRO-NORTH HARLEM RIVER LIFT BRIDGE WIRE ROPE REPLACEMENT, NEW YORK, NY

Project Manager for the replacement of the counterweight ropes on the Metro-North Harlem River Lift Bridge, which is the railroad's key link to Manhattan, **carrying 750 trains per day**. The project replaces **128 stranded cables, 2 3/8 inches diameter x 185 feet long each**, which lift the two, 330-foot-long main spans of the bridge. Construction staging includes building temporary work platforms above the tracks to allow trains to pass underneath while the individual cables are replaced one at a time. In addition, high-strength netting has been provided between towers to deflect a fallen rope away from the adjacent span. Spools of replacement cables are brought to the bridge on flat cars or high-rail equipment sited on the tracks directly underneath the platform. The project scope also includes a new cable lubrication system to forestall future deterioration. To date, most of the rope replacement have been done without track outages. (2012 – present)

STEPHEN A. MIKUCKI, PE DISCIPLINE LEAD – MOVABLE BRIDGE MECHANICAL RELEVANT PROJECT EXPERIENCE (CONT.)

CONNDOT REPLACEMENT OF TOMLINSON BRIDGE OVER QUINNIPIAC RIVER, NEW HAVEN, CT

Lead Mechanical Engineer for a \$120 million replacement of a double-leaf bascule with a new 270-foot-long, vertical-lift span which carries highway and railroad traffic over the Quinnipiac River. H&H performed a comprehensive feasibility study of bridge replacement alternatives focused on maintaining vehicular and railroad traffic during construction. In order to prevent service disruptions, a temporary bridge was built on adjacent alignment. The 930-ft long replacement structure consists of the approaches and a 270-foot tower drive lift span over a 240-foot-wide navigation channel. The lift span is the heaviest designed by H&H to date, weighing over 6.4 million pounds. (1997 – 2002)

AMTRAK MOVABLE BRIDGE TASK ORDER CONTRACT

Lead Mechanical Engineer for a task order contract which involved inspection, emergency repairs and rehabilitation of **Amtraks's movable bridges**, including Conn River and Shaws Cove Bridges in CT, Pelham Bay and Spuyten Duyvil Bridges in NY, Portal and Dock Bridges in NJ, Bush River Bridge in MD, Trail Creek Bridge in IN and South Branch Bridge in IL. (2003 – 2004). Notable assignments included:

- Shaws Cove Bridge, CT (swing) partial replacement of machinery
- Trail Creek Bridge, IN (swing) partial open gear replacement
- Bush River Bridge, MD (bascule) mechanical/electrical systems upgrade, including catenary system motorization.
- Connn River Bridge, CT (bascule) tread plate replacement; partial replacement of span operating machinery

CN RAILWAY GILL'S LANDING BRIDGE CONVERSION, WEYAUWEGA, WI

Lead Mechanical Engineer responsible for the reconstruction of Gill's Landing railroad bridge, which was built in 1871. The project involved an investigation of various alternatives that would enable the existing swing span to be returned to an operational condition. H&H recommended an innovative, cost saving solution to **convert the existing through-girder swing span into a short lift vertical lift bridge, using hydraulic cylinders** and steel tower framework mounted on the existing center pier. (2010)

CN RAILWAY SECOND NARROWS BRIDGE REHABILITATION, BURRARD INLET, VANCOUVER, BC

Lead Mechanical Engineer responsible for a mechanical rehabilitation of the Burrard Inlet **vertical lift railroad bridge** in Vancouver. The CN Second Narrows Bridge, **originally designed by Hardesty & Hanover** has 495 ft. vertical lift span and 150 ft. height, providing **450 ft. navigational channel**. The project involved rehabilitation of auxiliary counterweight machinery, including sheave, hitches, wire rope, and socket replacement. H&H also prepared a maintenance manual for the entire bridge machinery systems. (2000)

CONRAIL CALUMET RIVER RAILWAY BRIDGE, CHICAGO, IL

Lead Mechanical Engineer responsible for the mechanical rehabilitation of Calumet River **vertical lift railroad bridge** in Chicago. The Calumet River Bridge, **originally designed by H&H in 1912 (and still in service)** consists of twin vertical lift spans, 214 ft. long. H&H was responsible for mechanical/electrical rehabilitation, which included a replacement of the operating rope system, new flux vector drives, PLC system, and operating machinery completed. All work was completed in 3 months. (1998)

CONNDOT/METRO-NORTH WALK BRIDGE REPLACEMENT, NORWALK, CT

Lead Mechanical Engineer for a Feasibility and Economic Analysis Study to evaluate rehabilitation or replacement options for the four-track WALK Bridge on the Northeast Corridor. The project scope involved analysis and conceptual engineering for the replacement alternatives, including construction cost and life cycle cost comparisons. The project is currently in the preliminary design phase with H&H responsible for peer and constructability reviews. The existing swing bridge will be replaced with twin split-leaf bascule bridges (two tracks on each bridge) to provide redundancy to extreme weather events. (1999 – 2000)

ALEXANDER H. NOBLE, PE DISCIPLINE LEAD – MOVABLE BRIDGE ELECTRICAL

REGISTRATION

Professional Engineer: FL, MD, MI, NY, VA, WA

EDUCATION

B.E.E., 1989, Manhattan College

YEARS EXPERIENCE

Total Years: 25

HH Hardesty &Hanover



SUMMARY BIOGRAPHY

Alexander Noble has 25 years of design and management experience in electrical engineering with a focus on **movable bridge design and rehabilitation**. His expertise includes power, control systems, instrumentation and data acquisition. Mr. Noble has been responsible for all phases of the project delivery, including field investigation and evaluation of the existing electrical systems, feasibility studies for bridge replacement, development of detailed drawings and specifications and inspections of the work installed by the contractor. His notable assignments include rehabilitation of the Marine Parkway Bridge and Amtrak's Conn River and Pelham Bay Bridges.

With H&H: 15

Throughout his career, Mr. Noble delivered many successful movable bridge rehabilitation and replacement projects to the local and national railroads, including **Amrtak**, **Metro-North**, **NJ Transit**, **Norfolk Southern**, **CN Railway and others**. His experience also includes design of other heavy movable structures, such as retractable stadium roofs.

RELEVANT PROJECT EXPERIENCE

NORFOLK SOUTHERN MOVABLE BRIDGE CONTROLS UPGRADES

Lead Electrical Engineer responsible for the design to convert **four railroad movable bridges** on the Norfolk Southern Alabama Division from on-site manned to off-site remote control operations. The project scope included a design of new electrical controls, as well as miscellaneous mechanical and structural modifications necessary for the conversion. Mr. Noble was responsible for in-depth inspection of the four bridges and design of PLC based control system, as well as coordinated Railroad Signals and Communications with the new control system. During the design, **Hurricane Katrina** caused damage to the bascule span of one of the bridges, the Lake Pontchartrain Bridge, LA, which is heavily used by **Norfolk Southern** freight, as well as **Southern Railway** and **Amtrak**. H&H provided emergency response to assist in restoring movable span bridge operation. The emergency work was completed in 16 days. (2005 – 2009)

TBTA MARINE PARKWAY VERTICAL-LIFT BRIDGE REHABILITATION, BROOKLYN, NY

Lead Electrical Engineer for a major rehabilitation of the Marine Parkway Bridge, which is one of Hardesty & Hanover's signature bridges. Designed by H&H in 1937, the ¾-mile long bridge features 540 ft. long lift span, one of the longest in the world. The bridge remained virtually unchanged until the late 1990's when H&H was retained to lead a \$100 million reconstruction/rehabilitation effort, which included redecking and widening of the bridge. The project scope also involved major electrical upgrades, including feeder replacement and modification of the control system; roadway lighting, traffic signals, drainage and painting. Since then, H&H continues to provide assistance to TBTA on as-needed basis to address maintenance and operations issues. Our most recent assignment involved testing of the tension in the counterweight ropes, and making necessary adjustments. H&H is also providing a constructability review of the design developed for the upcoming major capital improvement project to extend the service life of the bridge by another 20 years. In addition, we are also be preparing a maintenance manual for the major electrical and mechanical components. (1996 – present)

ALEXANDER H. NOBLE, PE DISCIPLINE LEAD – MOVABLE BRIDGE ELECTRICAL RELEVANT PROJECT EXPERIENCE (CONT.)

CN RAILWAY GILL'S LANDING BRIDGE CONVERSION, WEYAUWEGA, WI

Lead Electrical Engineer for the reconstruction of Gill's Landing railroad bridge, which was built in 1871. The project involved an investigation of various alternatives that would enable the existing swing span to be returned to an operational condition. H&H recommended an innovative, cost saving solution to **convert the existing through-girder swing span into a short lift vertical lift bridge, using hydraulic cylinders** and steel tower framework mounted on the existing center pier. Responsible for the design of bridge control system. (2010)

AMTRAK CONNECTICUT RIVER BRIDGE FEASIBILITY STUDY, OLD SAYBROOK, CT

Lead Electrical Engineer for a feasibility study and conceptual design for the **replacement/rehabilitation of more than 100-year old railroad bridge** spanning the Connecticut River in Saybrook, CT. The provect involved a detailed inspection and Alternatives Study which evaluated various replacement /rehabilitation options. The alternatives were compared with regards to the impact on operations, cost and duration of construction, service life, maintenance requirements, environmental impacts, ROW impacts, constructability and safety. (2006 – 2007)

AMTRAK MOVABLE BRIDGE TASK ORDER CONTRACT

Lead Electrical Engineer for a task order contract which involved inspection, emergency repairs and rehabilitation of **Amtraks's movable bridges**, including Conn River and Shaws Cove Bridges in CT, Pelham Bay and Spuyten Duyvil Bridges in NY, Portal and Dock Bridges in NJ, Bush River Bridge in MD, Trail Creek Bridge in IN and South Branch Bridge in IL. Notable assignments included replacement of electrical controls for the Pelham Bay Bridge, which is a single-leaf Scherzer bascule. Mr. Noble was responsible, for the inspection, design and field testing. (2003 – 2004).

NJ TRANSIT MOVABLE BRIDGE INSPECTION – GROUP B

Lead Electrical Engineer responsible for in-depth inspections of three NJ Transit movable bridges: **Newark Draw-bridge**, a 220-foot-long swing span; the **Lower Hackensack Bridge**, a 200-foot-long vertical lift; and the **River Draw-bridge**, a 330-foot-long swing span. (2009)

CONNDOT/METRO-NORTH WALK BRIDGE REPLACEMENT, NORWALK, CT

Lead Electrical Engineer for a Feasibility and Economic Analysis Study to evaluate rehabilitation or replacement options for the four-track WALK Bridge on the **Northeast Corridor**. The project scope involved **analysis and conceptual engineering for the replacement alternatives**, including construction cost and life cycle cost comparisons. The project is currently in the preliminary design phase with H&H responsible for **peer and constructability reviews**. The existing swing bridge will be replaced with twin split-leaf bascule bridges (two tracks on each bridge) to provide redundancy to extreme weather events. (1999 – 2000)

AMTRAK CONN RIVER BRIDGE MECHANICAL/ELECTRICAL REHABILITATION, OLD SAYBROOK, CT

Lead Electrical Engineer for mechanical and electrical rehabilitation of Amtrak's Connecticut River Bridge, which is a **single-leaf Scherzer rolling-lift**. The work involved detailed inspection and design of replacement tread plates mounted for the segmental girders and track girders; partial replacement of the span operating machinery and full replacement of the electrical control system. The new design featured motion based primary control system and PC based data acquisition system. Some of the key issues included developing logistics and methodology for a fast-track inspection and operational evaluation to **minimize impact on rail operations on this important Northeast corridor bridge**. (1998 – 1999)

LADOTD REHABILITATION OF JUDGE SEEBER VERTICAL LIFT BRIDGE, NEW ORLEANS, LA.

Lead Electrical Engineer for the rehabilitation of **325 foot vertical lift bridge** over the Industrial Canal in New Orleans. This project involved a replacement of the counterweight ropes and the entire electrical system for the operation of the movable span. The electrical system was replaced in-kind using secondary resistance control operated with a drum switch as preferred by the owner. The counterweight ropes were replaced using an innovative design of the rope socket connection to the lifting girder. The new socket allows the ropes to be shimmed using a vertically elongated hole for the pin to ensure equal distribution of the load to each lifting rope. (2008)

RICHARD C. KEMPER, PE DISCIPLINE LEAD – APPROACH SPAN STRUCTURAL

REGISTRATION

Professional Engineer: PA, RI

EDUCATION

B.S.C.E., 1983, Villanova University

YEARS EXPERIENCE

Total Years: 32





SUMMARY BIOGRAPHY

Richard Kemper is currently Gannett Fleming's **Manager - Structures** responsible for preliminary and final structural designs, including contract drawings, specifications, and cost estimates. He islso responsible for structural inspection, rating analysis, and reports for roadway and railroad bridges and catenary structures. Mr. Kemper has diverse experience in a variety of bridge types, both railway and highway.

With GF: 7

RELEVANT PROJECT EXPERIENCE

AMTRAK NORTHEAST CORRIDOR IMPROVEMENT PROJECT, PROVIDENCE, RI

Task Manager of an individual task under a General Engineering Contract, responsible for the preliminary and final design of a superstructure replacement of a mainline bridge, U.G. Bridge No. 185.76, Smith Street Culvert, Tracks 2 and 7. Work included lowering the tracks to enhance vertical underclearance to nearby overhead roadway bridges; replacing an existing two-span open-deck concrete beam system with a two-span closed, ballasted deck system and reusing the existing abutments and center pier; and coordinating with the Rhode Island Department of Environmental Management, Amtrak, and the Rhode Island Department of Transportation.

NORTHEAST CORRIDOR IMPROVEMENT PROJECT, NOANK, CT, AMTRAK.

Task Manager of an individual task under a General Engineering Contract, responsible for the geotechnical exploration and subaqueous inspection of timber pile foundations at U.G. Bridge No. 130.63, Noank Cove Bridge. Subaqueous inspection involved environmental permitting with the Connecticut Department of Environmental Protection and the U.S. Army Corps of Engineers. Provided supervision of the diving team and subcontractor for the temporary removal of riprap and channel sediment for exposing, inspecting, and material sampling of the timber piles.

AMTRAK NORTHEAST CORRIDOR IMPROVEMENT PROJECT, CT, RI, AND MA

Task Manager - Structures responsible for performing field view and feasibility study on 22 miles of railroad tracks involving a total of approximately 80 overhead and undergrade bridges to permit tri-level, doublestack freight movement along Amtrak's Northeast Corridor between Davisville and Center Falls, Rhode Island. The feasibility study investigated bridge raise or replacement for additional dedicated freight track or enhanced vertical underclearance on Amtrak's mainline tracks. Also responsible for the subsequent preliminary designs within the 22 miles, as well as final design of 6 miles, of numerous bridge substructure stability investigations due to track lowering, bridge raises, and widening and replacement of undergrade bridges for the additional dedicated freight track. Responsible for in-depth inspection of one mainline railroad bridge and the final design of the superstructure replacement of two adjacent mainline bridges. Also responsible for the coordination and technical review of numerous bridge substructure stability analyses and field explorations due to track lowering in Connecticut, Rhode Island, and Massachusetts.

RICHARD C. KEMPER, PE DISCIPLINE LEAD – APPROACH SPAN STRUCTURAL RELEVANT PROJECT EXPERIENCE (CONT.)

SEPTA WAYNE JUNCTION TO GLENSIDE SYSTEM IMPROVEMENTS, PHILADELPHIA, PA

Project Manager - Structures responsible for the in-depth inspection, structural analysis, and preliminary and final design of the rehabilitation of approximately 200 catenary structures, including signal bridges. The work was part of an overall rehabilitation of 7.5 miles of two mainline tracks of commuter rail with new communication and signals, running bidirectional traffic, and an increase in commuter train headways.

NORTHEAST CORRIDOR IMPROVEMENT PROJECT, CT, RI, AND MA, AMTRAK.

Task Manager of individual tasks performed under an 8-year-long General Engineering Contract. Responsible for numerous individual project proposals, client contact and coordination, and state and local agency coordination for feasibility studies and preliminary and final designs for bridge raises, replacements, or removals to enhance vertical underclearances along Amtrak's electrification project between New Haven, Connecticut, and Boston, Massachusetts. Responsible for feasibility studies of 21 bridges for the electrification project, which developed into seven preliminary and final designs including the preparation of contract drawings, cost estimates, and specifications. Also responsible for construction services that involved shop drawing review and on-site consultation.

PENNDOT BRIDGE INSPECTIONS, DISTRICT 4, PA

Structural Engineer responsible for inspection, ratings, and reports for bridges containing fracture-critical members and fatigue-sensitive details, particularly single- and multi-span through-truss and through-girder structures over waterways and roadways involving nondestructive testing for the

PENNDOT RAIL BRIDGE INSPECTIONS, STATEWIDE, PA

Structural Engineer responsible for 121 railroad bridge inspections, ratings, and reports. Structure types included masonry and concrete arches and multi-span deck girders.

SEPTA BRIDGE INSPECTIONS, PHILADELPHIA, PA

Structural Engineer responsible for in-depth inspection, ratings, and reports for railroad bridges. Structure types ranged from single-span through-girders to multi-span deck girders on steel column bents.

PTC BRIDGE INSPECTIONS, STATEWIDE, PA

Structural Engineer responsible for ratings for bridges on the Northeast Extension of the Pennsylvania Turnpike. Analysis included main truss elements and gusset plate connection at panel points.

MDSHA HANOVER STREET BRIDGE, BALTIMORE, MD

Senior Structural Engineer responsible for rating analyses and a report, final design, contract drawings, specifications, and a shop drawing review and on-site construction for the rehabilitation of the Hanover Street Bridge, a double-leaf Rall bascule span. The rehabilitation included deck and stringer replacement through staged, panelized construction and repairs to the existing deck truss and girder structure for strength and fatigue-sensitive, fracture-critical members and details.

NYSDOT GOWANUS EXPRESSWAY, BROOKLYN, NY

Design Engineer responsible for the inspection and final design of a 2,800-foot section of slab and stringer replacement, which framed into the web of existing steel floor beams. Staged construction was used, and the limits of the deck replacement were confined between the existing stringers of the wide median.

PAUL J. CONNOLLY, PE DISCIPLINE LEAD – ALTERNATIVES ANALYSIS

REGISTRATION

Professional Engineer: NY, NJ, MD, CT

EDUCATION

B.S.C.E., 1986, New Jersey Institute of Technology M.E.P.P., 2012, University of Wisconsin at Madison

YEARS EXPERIENCE

Total Years: 29

Herdesty &Hanover



SUMMARY BIOGRAPHY

Paul Connolly is a **Project Manager** and **Discipline Leader** in structural engineering with extensive experience in the rehabilitation and replacement of the infrastructure, including bridges, highways, railroads and related facilities. He has been **responsible for all phases of the project delivery**, including inspections, engineering analyses, feasibility studies, structural rehabilitation designs, agency coordination and preparation of comprehensive contract documents. He has also supervised preparation of environmental reports for bridge projects during the initial planning stages.

With H&H: 29

Mr. Connolly's design management experience includes projects such as the ongoing Rehabilitation of the **Metro-North Harlem River Lift Bridge**, which is the single most important link for the Metro-North Service to Manhattan, carrying carries 750 trains per day. He is also managing Amtrak's Task Order Contract and a feasibility study for the **replacement of a 100-year old Brielle Bridge on the New Jersey Transit Coast Line**.

Mr. Connolly has a strong technical background in rail engineering and has been actively involved in the work of the **AREMA Committee 10**. His combination of **engineering skills and management experience** allows him to effectively guide the design team in the development of creative, yet practical and easy to implement design solutions.

RELEVANT PROJECT EXPERIENCE

NJ TRANSIT BRIELLE BRIDGE REPLACEMENT FEASIBILITY STUDY, BRIELLE/POINT PLEASANT, NJ

Project Manager responsible for a feasibility study for the replacement of a 100-year old Brielle **Movable Bridge on the NJ Transit Coast Line**. H&H is conducting a comprehensive analysis of different track profiles and structural systems for the movable span and approaches. Each alternative has been analyzed with regards to the environmental impacts, flood resiliency, navigational clearances, constructability, maintenance issues, construction cost (including force account), visual impact and other pros and cons. The key issues include coordination with SHPO; agency approvals/permitting; low vertical clearance and substandard channel width (48 feet). Estimated construction cost \$102 million. (2014 – present)

METRO-NORTH HARLEM RIVER LIFT BRIDGE WIRE ROPE REPLACEMENT, NEW YORK, NY

Project Manager during construction stage of the project which involves a replacement of the counterweight ropes on the Harlem River Lift Bridge. The Harlem River Lift is a critical component of the Metro-North infrastructure, providing a connection for all MNR service (750 trains per day) to Manhattan. The project replaces 128 stranded cables, 2 3/8 inches diameter x 185 feet long each, which lift the two, 330-foot-long main spans of the bridge. Construction staging includes building temporary work platforms above the tracks to allow trains to pass underneath while the individual cables are replaced one at a time. The key issues included **constructability**, work staging to minimize impact and assure safety of the railroad operations. (2012 – present)

AMTRAK TASK ORDER CONTRACT 2010 – 2014, NORTHEAST CORRIDOR

Project Manager for a Task Order Contract with Amtrak. Scope of work includes structural, civil, geotechnical, mechanical and electrical engineering services required for various stages of the project delivery, from inspection

PAUL J. CONNOLLY, PE DISCIPLINE LEAD – ALTERNATIVES ANALYSIS RELEVANT PROJECT EXPERIENCE (CONT.)

and scoping, through feasibility/alternative development to final design and production of plans, specifications and cost estimates. Some of the notable assignments included: **rehabilitation of two bridges on Amtrak's Harrisburg line** in Philadelphia; **superstructure replacement of Orange Street Bridge in Wilmington**, Delaware; structural rehabilitation of a signals bridge; mechanical/electrical rehabilitation of the Suyten Duyvil Movable Bridge; and others.

CANADIAN NATIONAL RAILWAY BRIDGE NO. 728, LAKEFRONT DIVISION, EAST CHICAGO, IL

Project Manager responsible for an **emergency evaluation of the damaged truss and floor system** along with checking of the operating machinery after a major vessel collision. Reviewed emergency field repairs made by CN, and developed additional repair recommendations to get the damaged draw span back in operation for marine traffic. (2013)

SCOTLAND HILL ROAD BRIDGE & NYSTA BRIDGE AT MP 45.18 OVER CONRAIL, HARRIMAN INTERCHANGE, NY

Project Engineer responsible for preparing contract plans, specifications and cost estimate for the **rehabilitation/replacement of two bridges, one of which spans over Conrail tracks**. For the Scotland Hill Road Bridge, the design included: concrete deck stripping, repairing, sealing, and resurfacing; bearing replacement and joint and diaphragm repairs. For the NYSTA Bridge at MP 45.18 over Conrail, work included complete design for a three-span continuous steel stringer and reinforced concrete deck superstructure supported by reinforced concrete piers and abutment founded on cast-in-place concrete piles. **Staging of construction to maintain uninterrupted rail service** was the key to keeping the project on schedule. (2001 – 2002)

AMTRAK CONNECTICUT RIVER BRIDGE MECHANICAL REHABILITATION, OLD SAYBROOK, CT

Lead Structural Engineer provided office and field support for the mechanical rehabilitation of the bridge operating machinery. The work involved detailed inspection and design of replacement tread plates mounted for the segmental girders and track girders, as well as partial replacement of the span operating machinery. **Developed logistics and methodology for a fast-track inspection and operational evaluation to minimize impact on rail operations on this important Northeast corridor bridge**. (1998 – 1999)

AMTRAK INSPECTION OF 30 UNDERGRADE BRIDGES, CT, NJ, PA, & MD

Project Engineer responsibilities included coordinating the fieldwork for the inspection, evaluation, load rating of the bridges and performing the Quality Assurance/Quality Control of the field inspection reports. **Inspection logistics were developed to minimize impact on rail operations.** (1999 – 2000)

AMTRAK BUSH RIVER BRIDGE, PERRYMAN, MD

Team Leader for the inspection, evaluation, load rating, machinery analysis and condition report for this single-leaf heel trunnion bascule bridge with a 40-foot main span. H&H prepared a complete condition report of the structural, mechanical, electrical systems including machinery analysis, repair recommendations and cost estimates that included the movable catenary system rehabilitation/motorization. (1998 – 1999)

NYCDOT WILLIS AVENUE SWING BRIDGE OVER THE HARLEM RIVER, NEW YORK, NY

Project Engineer responsible for the preparation of contract plans, specifications and cost estimate during the completion of final design on a \$600 million bridge project, which involved off-line replacement of a major 345-foot-long, swing bridge and 3,000 feet of highway approaches. Mr. Connolly was for the supervision and coordination of the in-house team, including structural, mechanical and electrical design for the swing span, and seismic and geotechnical design of the substructure. (2005 – 2007)

NYCDOT THIRD AVENUE SWING BRIDGE OVER THE HARLEM RIVER, NEW YORK, NY

Project Engineer responsible for the preliminary and final design on a project which involved replacement for a 302-foot, swing bridge and 1,351 feet of approach spans. Responsible for preparation of the BRPR and development of the structural alternatives. His work involved a development of the demolition and construction staging schemes plus the overall coordination of the development of the contract plans, specifications and estimate. Mr. Connolly was also responsible for coordinating the structural details with the operating machinery and electrical equipment on the swing span. (1995 – 2000)

DAVID M. MARCIC, PE, SE DISCIPLINE LEAD – SEISMIC DESIGN

REGISTRATION

Professional Engineer: NY, DE, MD, DC Structural Engineer: DC, WA

EDUCATION

B.S.C.E., 1995, Rensselaer Polytechnic Institute M.S.C.E., 1999, Rensselaer Polytechnic Institute

YEARS EXPERIENCE

Total Years: 19

HH Hardesty &Hanover



SUMMARY BIOGRAPHY

David M. Marcic is a **Senior Structural Engineer** with 19 years of experience in the design and rehabilitation of fixed and movable bridges, tunnels and other transportation structures. His particular area of focus is **seismic analysis and design, seismic vulnerability assessment and retrofit**. Mr. Marcic's main responsibilities include computer modeling and seismic analysis of bridges, as well as seismic design and detailing. His experience also includes inspection, load rating, fatigue evaluation and structural design for rehabilitation and replacement of fixed and movable bridges (medium and long spans).

With H&H: 19

Mr. Marcic was the **Project Engineer** for a \$140M replacement of Amtrak's **Niantic River Drawbridge** on Northeast Corridor. His other notable projects include seismic retrofit of **Murray Morgan Vertical Lift Bridge**, WA, and **Harlem River Lift Bridge**, NY; seismic design for a D/B replacement of **Ben Sawyer Swing Bridge**; load rating and fatigue evaluation of a **landmark Whirlpool Rapids Bridge** in Niagara Falls (550 ft. steel arch); and design of two **new 200ft. bascule bridges** in Port Adelaide, Australia, carrying railroad and highway traffic.

RELEVANT PROJECT EXPERIENCE

AMTRAK NIANTIC DRAWBRIDGE, EAST LYME, CT

Project Engineer for a \$140 million replacement of the Niantic River Drawbridge on **Amtrak's Northeast Corridor**, which carries 54 trains daily, including Amtrak, ConnDOT's Shore Line East and freight. The project involved off-line replacement of the existing structure. The **new 140 ft. long single-leaf bascule span** carrying two railroad tracks was constructed 58 feet south of the existing railroad alignment. Responsible for the design of the bascule span and approach spans. Coordinated multidiscipline team in the development of design calculations, contract plans and specifications. Also led the design of the bascule span, trunnion towers and control house. (2010 – 2013)

MURRAY MORGAN BRIDGE REHABILITATION DESIGN/BUILD, TACOMA, WA

Structural Engineer responsible for the **seismic analysis and rehabilitation design of this vertical lift bridge**. The bridge is comprised of three steel through truss spans (190ft, 220ft, 190t) and nine steel girder/floorbeam approach spans. Analysis included the creation of 3-D computer model using SAP2000 software and performing a linear response spectrum and non-linear time history analysis for a 108 year operation level and 1,000 year life safety event. Capacity to demand ratios were established for all primary bridge members including truss chords and diagonals. Isolation bearings were designed on the approach spans. (2011 – 2013)

NJTA SEISMIC VULNERABILITY ASSESSMENT OF SEVEN BRIDGES, NJ

Structural Engineer responsible for the **seismic analysis and vulnerability assessment** of seven NJ Turnpike bridges. Analysis included the creation of 3-D computer models using SAP CSi Bridge software and performing linear response spectrum analyses for 1,000 and 2,500 year events on essential/critical bridges. Capacity to demand ratios were determined for all bridge members, including bearings, substructure piers and foundations. Prepared seismic report including conceptual retrofit designs and cost estimates. (2012 – 2013)

DAVID M. MARCIC, PE, SE DISCIPLINE LEAD – SEISMIC DESIGN

RELEVANT PROJECT EXPERIENCE (CONT.)

TBTA REHABILITATION OF HARLEM RIVER LIFT BRIDGE, RANDALL'S ISLAND, NY

Project Engineer responsible for **seismic analysis of vertical lift bridge**. The bridge is comprised of three steel through truss spans (153ft, 310ft, 242ft) and four steel girder/floorbeam approach spans. Analysis included the creation of a 3-D model of the bridge in ADINA software, and performing a linear response spectrum and non-linear analysis for 500 and 2,500 year seismic events. Capacity to demand ratios were established for all primary bridge members including the steel truss, towers and foundations. Isolation bearings were designed for the flanking approach truss spans. Retrofits were also designed for the lift span and counterweight guides. Prepared report, recommendations, retrofit designs and cost estimates. (1998 – 2004)

DESIGN-BUILD REPLACEMENT OF BEN SAWYER SWING BRIDGE, SULLIVANS ISLAND, SC

Structural Engineer responsible for the seismic evaluation and design of the new bridge on existing substructure. The bridge is comprised of a new 245-foot long steel through truss swing span and 12 girder/floorbeam approach spans. 3-D computer model was developed using SAP2000 software and a site-specific linear and non-linear time history analyses was performed. In-depth evaluation of the existing concrete piers and timber pile foundations were performed to establish capacity-to-demand ratios. Isolation bearings were designed for all approach spans to mitigate seismic forces and avoid pier retrofits. Complete seismic evaluation report and design calculations were prepared and submitted in accordance with SCDOT guidelines and FHWA requirements. (2009 – 2010)

NJDOT ROUTE 1&9T OVER ST. PAUL'S VIADUCT, JERSEY CITY, NJ

Structural Engineer responsible for **load ratings and seismic analysis** of the new ramp structures. This project is a new interchange with elevated structures, including an extended viaduct and ramps totaling 7,300 feet to connect Tonnele Avenue to Routes 7 and 1 & 9T. Analysis included the creation of three dimensional computer analysis using SAP software. Prepared load rating calculations and seismic evaluation report. (2006 – 2007)

PORT RIVER BASCULE BRIDGES, PORT ADELAIDE, SOUTH AUSTRALIA

Structural Engineer on a project involving the design of **two new 200 ft. bascule bridges (railroad and highway)** in Port Adelaide, Australia. The design was in accordance with the Australian (AS5100) Bridge Code and the AREMA manual, which was used for movable bridge requirements. The design employed creative architectural forms, with V-shaped post-tensioned concrete bascule piers and steel box-shaped bascule girders. The piers geometry features angles complementary to the open-span angle. Responsible for the design the bascule span floor system and deck over counterweight span. Prepared design calculations and produced contract drawings and specifications for the superstructure. (2006 – 2008)

WHIRLPOOL RAPIDS BRIDGE, NIAGARA FALLS, NY

Project Engineer responsible for detailed inspection and load rating of 100-year old, **double level railroad and high-way bridge** spanning the border between the US and Canada and comprised of steel arch span of 550 feet and two flanking span trusses 115 feet each. Responsible for overseeing project work and coordinating multidiscipline team. Key challenges included development of load rating guidelines for this combination use bridge, as well as calibrating US and Canadian highway and railway design codes. Performed load rating analysis of the main arch span and two approach truss spans. Also performed a fatigue evaluation of the structure and prepared findings report for the field inspection and load rating analysis, including recommendations and cost estimate. (2006)

ALFORD STREET BRIDGE OVER THE MYSTIC RIVER, BOSTON, MA

Structural Engineer responsible for the **seismic evaluation** of the 1,400-foot-long bridge crossing the Mystic River, as part of a \$25 million rehabilitation. The bridge comprises eight spans; seven approach spans and twin, double-leaf steel bascules (160 feet long). The evaluation included linear Response Spectrum Analysis utilizing site-specific seismic data. Work involved in-depth evaluation of the existing substructure and establishing capacity-to-demand ratios for all critical components. Three-Dimensional computer model was developed using SAP 2000 software. (2013 – 2014)

EDWARD M. ZAMISKIE, JR, PE DISCIPLINE LEAD – GEOTECHNICAL

REGISTRATION

Professional Engineer: NJ, NY, CT, PA

EDUCATION

M.E.C.E., 1988, Stevens Institute of Technology B.S.C.E., 1981, Lafayette College

YEARS EXPERIENCE

Total Years: 34

ALEX



SUMMARY BIOGRAPHY

Mr. Zamiskie has more than 30 years of geotechnical engineering experience. He is responsible for planning, field investigations, laboratory testing programs, permitting, evaluation and analysis, design, specifications, drawing, report preparation, construction support and project administration. Mr. Zamiskie, as a member of the firm's Energy & Infrastructure Business Unit, is primarily involved with transportation, water/wastewater treatment and conveyance, dam, and other infrastructure projects. He leads Haley & Aldrich's geotechnical engineering practice in the Parsippany, NJ office, which focuses on New Jersey and the New York metropolitan area, where he has spent his entire career and has been fortunate to be involved with major bridge replacement and retrofit projects. His responsibilities include mentoring the staff, guiding and executing technical work and ensuring that the right company-wide resources are engaged to provide the best value to clients. He takes an active "hands-on" role in large complex projects where he brings to bear expertise in optimizing high-capacity foundations and ground improvement solutions for difficult geologic conditions.

With H&A: 16

RELEVANT PROJECT EXPERIENCE

NJDOT VICTORY BRIDGE, ROUTE 35, PERTH AMBOY-SAYREVILLE, NJ

Geotechnical Engineer of Record for new bridge and approach roadways crossing Raritan River. Bridge consists of a 4,000 lf precast segmental concrete structure. Major foundation types included 20 in. dia. high-capacity concrete-filled pipe piles and 6 and 8-ft diameter drilled shafts (90 to 150 ft deep) socketed into diabase rock. Ground improvement on south approach solved settlement and liquefaction issues and included load transfer platform supported by vibro concrete columns and wick drains with preload/surcharge. Load testing of foundation elements included Osterberg Load Cell and Statnamic testing. Subsurface conditions included thick deposits of soft compressible organic soils/river silts. Seismic loads controlled the foundation design, and liquefaction and lateral spreading potential were addressed by design capacity and ground improvement techniques. Performed engineering services during construction and managed inspection of drilled shafts. (2001-2005)

NEW JERSEY TRANSIT LAUTENBERG RAILROAD STATION/ NEC IMPROVEMENTS, SECAUCUS, NJ

Geotechnical Project Manager for geotechnical investigation, laboratory testing, foundation analysis, design and construction specifications for railroad widening and multiple viaduct replacement project to support new station. Field investigation included about 300 borings, including pressuremeter testing in soil and rock. Foundations included spread footings, H-piles with rock anchor tie-downs for seismic loads and drilled shafts. Multi-stage preload/surcharge ground improvement program using wick drains was designed to support up to 30 ft of new widened embankment over deep soft organic soils. Designed and implemented geotechnical instrumentation program including settlement plates, vertical and horizontal slope inclinometers, and piezometers to protect active NEC and NJ Transit tracks and guide construction schedule and sequencing. Established site-specific seismic site response using cross-hole seismic geophysical test program and utilized Osterberg Cell Load test to optimize skin friction and end bearing capacity of drilled shafts for station. Construction – period engineering and monitoring services. (1989-1999)

EDWARD M. ZAMISKIE, JR., P.E. DISCIPLINE LEAD – GEOTECHNICAL

RELEVANT PROJECT EXPERIENCE (CONT.)

PANY/NJ GOETHALS BRIDGE REPLACEMENT, ELIZABETH, NJ/STATEN ISLAND, NY

Geotechnical Lead during pursuit and **Officer-in-Charge** during execution of the 7,000-linear-foot P3 replacement bridge. Responsibilities include subsurface investigation program consisting of about 140 borings and SCPTs, laboratory testing, preparation of data reports, design of drilled shafts for Travis Railroad Bridge, and design of both ground supported and driven pile-supported retaining walls using LRFD procedures. Also participated in peer review of rock-socketed drilled shaft designs for approach and main spans. (2012-current)

NYSDOT KOSCIUSZKO BRIDGE REPLACEMENT, BROOKLYN – QUEENS, NY

Project Manager and Technical Lead for Haley & Aldrich's role for \$555 MM Design/Build of 6,000 lf structure supported by drilled shafts, driven pipe piles, mini-plies and spread footings. Haley & Aldrich provided subsurface investigation and laboratory testing lead supervision, data geotechnical report preparation for 5 project segments, subsurface profiles and cross sections, determination of project-wide soil properties, analysis and design of abutments, retaining walls and embankments for approaches and single-span overpasses, instrumentation and monitoring plans. Work complied with LRFD and NYSDOT requirements. Also provided analysis and consultation regarding significant soil and groundwater contamination at the site. (2013-current)

NJDOT SHREWSBURY RIVER, ROUTE 36 BRIDGE, HIGHLANDS, NJ

Engineering Consultant to contractor, pile analyses, borings and load test program for high-capacity 54 in. dia. Precast pre-stressed cylinder piles and 16 in. and 24 in. square precast concrete piles. Land and water-based borings to evaluate extremely dense soil conditions and provide recommendations for installation of piles. (2008)

NYC MTA B&T MARINE PARKWAY BRIDGE AND CROSS BAY BRIDGE RESILIENCY STUDY, BROOKLYN, NY

Geotechnical Project Manager for resiliency and master planning study for two crossings of Rockaway Inlet. Work involves review of historic information, investigations using drill and CPT rigs from barge, seismic site response and evaluation of repair and replace alternatives for 1971 concrete bridge on cylindrical concrete piles and 1938 steel bridge with center lift bridge section on timber piles. (2014-current)

CAPE MAY COUNTY BEESLEY'S POINT BRIDGES, UPPER TOWNSHIP, NJ

Project Manager for geotechnical investigation and bridge replacement/rehabilitation and retrofit analysis for feasibility study to reopen closed crossing. Structure includes Egg Harbor Channel and Drag Channel crossing for combined length of about 4,800 ft. Original concrete piers are supported on timber piles and retrofit with battered steel pipe piles. Because of the lack of subsurface data and the inability to access the bridge with heavy drilling equipment the work included advancing tripod probes from the existing bridge structure and correlating those results with GSP parkway borings. In addition, because of the lack of as-built steel pile records the pulse echo non-destructive geophysical method was used to estimate total length, mudline and embedment into bearing stratum at reprehensive locations. With these data existing pile capacities we computed. Pile design and bulkhead alternatives were developed to support the reconstruction cost estimate. (2010)

HUDSON COUNTY 14 STREET VIADUCT REPLACEMENT, HOBOKEN, NJ

Geotechnical and hazardous materials investigation and pile foundation design for new 1700 lf bridge replacement project. Subsurface conditions include uncontrolled fill, deep peat and organic silt deposit, outwash, till and bedrock. Performed site-specific seismic analysis and environmental investigation to address contaminated soil and groundwater. Designed H-pile foundations and estimated performance of temporary bridge supports during staged construction. (2009-2015)

JOHN F. LEGATH, JR, PE DISCIPLINE LEAD – TRACK DESIGN



Professional Engineer: PA e-RAILSAFE Badge: e-VERIFILE.COM, Inc.

EDUCATION

B.S.C.E., 1978, Lehigh University

YEARS EXPERIENCE

Total Years: 37

With Gannett Fleming: 19





SUMMARY BIOGRAPHY

John F. Legath is a **Senior Track Engineer** responsible for track and civil design work involving the preparation of plans, specifications, and estimates (PS&E) for track reconfiguration; horizontal and vertical track alignment; earthwork, drainage, soil erosion and sediment (E&S) pollution control; and site layout for rail and transit facilities.

Mr. Legath was *Senior Track Engineer* for the design of track alignment and profile, earthwork, and drainage for numerous projects on Amtrak's Northeast Corridor. He was solely responsible for track alignment and track staging plans for Amtrak/New Jersey Transit's Portal Bridge Project. Additionally, he was track and civil engineer for track alignment on Amtrak's Niantic River Bridge.

RELEVANT PROJECT EXPERIENCE

AMTRAK NIANTIC DRAWBRIDGE, EAST LYME, CT

Project Track and Civil Engineer responsible for the **design of track alignment and profile, earthwork, drainage, and soil E&S pollution control**. The project involved track realignment of Amtrak's Northeast Corridor 58 feet south of the existing track bed to construct a new bridge to carry high-speed passenger rail lines over the Niantic River. Our firm was responsible for civil, track, communication and signals, electric traction, and geotechnical work.

PORTAL BRIDGE CAPACITY ENHANCEMENTS, NEWARK, NJ

Project Track Engineer responsible for the preliminary and final engineering for a critical 2.5 miles of Amtrak's Northeast Corridor between Newark, New Jersey, and New York City. Responsible for developing **track alignments and track staging plans** for the most heavily travelled corridor in the country, carrying both Amtrak's high-speed intercity service and NJ Transit's commuter service. The project involves expanding the two-track railroad to five tracks and reprofiling it to replace the existing swing bridge with two fixed bridges over the Hackensack River to eliminate a long-standing operational bottleneck. Due to the 472 trains per day of traffic, detailed construction staging was developed to minimize impacts to operations.

KEYSTONE CORRIDOR WEST HIGH-SPEED RAIL, HARRISBURG-PITTSBURGH CORRIDOR, PA

Conceptual Engineering Task Leader responsible for developing alternatives for high-speed rail infrastructure improvements between Harrisburg and Pittsburgh along the existing Norfolk Southern Pittsburgh Line. The speed and capacity of the existing main line is constrained due to heavy freight traffic volumes and curving mountainous terrain. The goal of the study is to increase the speed and capacity of passenger train service between the two cities within the framework of the national high-speed rail program. Duties include developing conceptual alignment alternatives; developing infrastructure requirements among 11 disciplines; and preparing conceptual infrastructure cost estimates. The results of the feasibility study and estimates will enable PennDOT to recommend capital improvements to the legislature for consideration of funding.

JOHN F. LEGATH, JR, PE DISCIPLINE LEAD – TRACK DESIGN

RELEVANT PROJECT EXPERIENCE (CONT.)

CURVE MODIFICATIONS FOR HIGH-SPEED RAIL PROGRAM, NY & CT

Project Track Engineer responsible for **designing railroad curve modifications** along the Metro-North Railroad portion of the railway between New Rochelle, New York, and New Haven, Connecticut, to facilitate an Amtrak speed increase on the Northeast Corridor. Design included changes in curvature, superelevation, and spiral length to allow track speed increases for conventional track equipment and Acela tilt-train technology.

GAUNTLET TURNOUT FOR AMTRAK LEAD AT CIRA CENTRE, PHILADELPHIA, PA

Senior Track Engineer responsible for the detailed **design of a new No. 10 Gauntlet turnout** on an existing Amtrak lead track. The existing turnout needed to be lengthened by 70 feet to accommodate paving in front of a loading dock for the new Cira Centre development located next to Amtrak's 30th Street Station.

QA/QC PROGRAM, QUALITY PERFORMANCE MEASUREMENT OF FIELD OPERATIONS, NATIONWIDE

Quality Control Engineer responsible for conducting field studies and research, as well as reporting baseline measurement of subdivision operations and recommended improvements.

DRAINAGE IMPROVEMENTS FOR SUBTRACKS 1, 2, AND 4 IN SUNNYSIDE YARD, QUEENS, NY

Civil Engineer responsible for the **design of improvements to eliminate drainage problems** at Amtrak's Sunnyside Yard. Providing storage and holding facilities for the Acela train sets and the high-speed shop in Queens, Sunnyside Yard is adjacent to Amtrak's Harold Interlocking, which controls movement in and out of the east side of Manhattan from Penn Station through the East River Tunnels. The existing drainage system, constructed early in the 20th century, was obsolete and in disrepair. The project involved a study of the drainage system, a runoff and pipe capacity analysis for a 25-year storm, and options for new drainage facilities.

CORRIDORONE MINIMUM OPERATING SEGMENT, MECHANICSBURG TO LANCASTER, PA

Project Track Engineer responsible for the **preliminary design for the start-up transit project** to link Harrisburg with Mechanicsburg on the west and with Lancaster on the east. The western leg of the proposed transit line, initially 6 miles to Mechanicsburg, was intended to use the existing Norfolk Southern Shippensburg Secondary right-of-way and some trackage. The east leg was intended to use the existing track of Amtrak's Harrisburg Line. Responsible for new track alignment and tie-ins with Norfolk Southern and for design of track modifications and improvements to Amtrak's Harrisburg Station and Lancaster Station. Also involved with in-depth engineering and operating negotiations with Amtrak and Norfolk Southern.

PASSING SIDINGS, NORTHEAST CORRIDOR IMPROVEMENTS, CLINTON AND GUILFORD, CT

Project Engineer working on the **final design of passing sidings**. Responsibilities included the development of construction and right-of-way plans showing geometric design of horizontal and vertical alignment, drainage, E&S pollution control, grade crossings, and utility relocations. Provided specifications and cost estimates.

EXPERIENCE WITH PRIOR FIRMS

CONSOLIDATED RAIL CORPORATION

Assistant Track Supervisor in Conrail's New Jersey and Harrisburg Divisions. Duties included supervision of maintenance staff in the various phases of **track maintenance**; construction management; track inspection to federal specifications; inventory management; and repair of emergency derailments. Directed manpower allocations and scheduled work with outside contractors.

TERRY A. SHANTZ, PE DISCIPLINE LEAD – CATENARY/TRANSMISSION

REGISTRATION

Professional Engineer: NJ, CT, MD, PA, NY, FL, CA, OH, IN, TX, VA, CO

EDUCATION

B.S.C.E., 1977, University of Maryland

YEARS EXPERIENCE

Total Years: 38

With Gannett Fleming: 16



Gannett Fleming

SUMMARY BIOGRAPHY

Terry Shantz is currently **Vice President and Director of Electric Traction** overseeing the **Catenary Design and Substation Design Sections** in the Valley Forge, Philadelphia, and Pittsburgh offices. Responsible for project management, technical reviews, quality assurance/quality control (QA/QC) reviews, studies, detail design, cost estimates, and specifications. Responsible for overseeing business development activities. Additional railroad electrification experience includes expert construction claims analysis and value engineering.

RELEVANT PROJECT EXPERIENCE

AMTRAK NIANTIC RIVER BRIDGE REPLACEMENT

Electric Traction Discipline Lead responsible for conceptual, preliminary, and final design for modifications to the existing electric traction facilities to permit the construction of a replacement two-track bascule moveable bridge and 0.75 miles of railroad approaches on Amtrak's Northeast Corridor. Also led the production of construction plans and cost estimates. The Niantic River Bascule Lift Bridge Replacement Final Design Engineering Services project was presented 2013 Excellence in Construction "Best in Show" Award by the Associated Builders and Contractors of Connecticut.

NJ TRANSIT HUDSON-BERGEN LIGHT RAIL TRANSIT, BAYONNE, NJ

Lead Catenary Engineer responsible for designing modifications to the existing catenary system, provisions for new catenary poles, as well as down guys and a grounding system on the viaduct structure.

NJ TRANSIT GLADSTONE LINE OVERHEAD CONTACT SYSTEMS, GLADSTONE TO SUMMIT, NJ

Project Manager responsible for the replacement of wood-pole catenary structures with concrete foundation, steel-pole catenary support structures.

CALTRAIN RAIL CORRIDOR ELECTRIFICATION PROGRAM MANAGEMENT SERVICES, MENLO PARK, CA

Overhead Contact System (OCS) Discipline Leader responsible for the design of the baseline OCS documents that were used to solicit design-build bids. The project is comprised of electrification program management and design services for a new electrification system on roughly 51 miles of Caltrain right-of-way from San Francisco to San Jose, California. Caltrain presently operates diesel push/pull service on this route and will convert to a 25 kV 60 hertz electrification system to operate its service.

AMTRAK DESIGN OF NEW MONOPOLES FOR PECO TUNNEL, PHILADELPHIA, PA

Project Manager responsible for supervising the design of five transmission monopoles, providing the standard design specifications for the pole fabrication, and working with the fabricator and pole designer to verify that design criteria were met. Work also included designing the monopole foundations according to the base reactions provided by the pole fabricator and providing construction support.

TERRY A. SHANTZ, PE DISCIPLINE LEAD – CATENARY/TRANSMISSION RELEVANT PROJECT EXPERIENCE (CONT.)

MTA REVISED WEDGE YARD CATENARY DESIGN FOR MARC COMMUTER RAIL, WASHINGTON, DC

Design Principal responsible for catenary modifications required for the electrification of the MTA yard tracks at the lvy City site. Responsibilities included the design of catenary profiles, catenary structures, feeders, and bonding and grounding. This project won Gannett Fleming's 2015 Project Team Award. This award is based on the project's significance to the firm, its financial success, client satisfaction, and the teamwork demonstrated throughout the project.

SOUTH STREET BRIDGE RECONSTRUCTION OVER AMTRAK AND SEPTA TRACKS, PHILADELPHIA, PA

QA/QC Manager on this project involving the design of new catenary structures; modifications to existing catenary and transmission wire profiles; and the development of hardware assemblies, erection diagrams, wiring plans, steel details, and a master bill of material.

LIRR EAST SIDE ACCESS, NEW YORK, NY

Electric Traction Manager responsible for reviewing the catenary design for the three loop tracks leading into Sunnyside Yard and for evaluating the sectionalization of the new Harold Interlocking catenary modifications, as part of a project to provide LIRR passengers with direct service into the existing Grand Central Terminal in Manhattan. Also served as Discipline Leader for traction power design for portions of three substations and the 138 kV transmission line that will be relocated to supply power to the Sunnyside Yard static frequency converter.

NJ TRANSIT MORRISVILLE YARD CONSTRUCTION-RELATED SERVICES, MORRISVILLE, PA

Task Manager responsible for the Phase 2 design of catenary and support structures involving power feeds, static wires, rail return, and bonding and grounding for two new yards consisting of 14 and 15 tracks, respectively.

NICTD REPLACEMENT OF MAINLINE CATENARY SYSTEM, SOUTH BEND, IN

Project Manager responsible for the engineering and design of new catenary on the main rail line from the Illinois/Indiana state line to South Bend. The project involved a site survey, design alternative evaluation, layout of catenary, new sectionalization, new assemblies, and construction cost estimates.

NJ TRANSIT PENN STATION TRACKS #11 AND #12, NEW YORK, NY

Project Manager responsible for modifications to an Amtrak catenary. Tasks included site verification of assemblies, measurement of catenary wire heights, reprofiling of the catenary, and modification of feeders and disconnect switches.

NJ TRANSIT SECAUCUS TRANSFER, SECAUCUS, NJ

Project Manager responsible for providing technical assistance and scheduling input for Amtrak crews installing a modified catenary. The project included temporary and final relocation of electrified mainline tracks on the Northeast Corridor.

RAMESH RAJAGOPAL, PE

REGISTRATION

Professional Engineer: DE

EDUCATION

B.S.C.E., 1983, Bangalore University INDIA HEC-2, 1995, Rutgers, The State University of New Jersey HEC-1, 1996, Rutgers, The State University of New Jersey

YEARS EXPERIENCE

Total Years: 28

With Gannett Fleming: 18



Gannett Fleming

SUMMARY BIOGRAPHY

Ramesh Rajagopal is a **Project Engineer** responsible for highway drainage designs, reports, construction drawings and specifications, floodplain delineations, stormwater management, flood control, dam rehabilitations, bridge scour evaluations, soil erosion and sediment control designs, and the procurement of New Jersey Department of Environmental Protection (NJDEP) stream encroachment and Federal Emergency Management Agency (FEMA) permits. Mr. Rajagopal possesses a technical background that includes the hydrologic modeling of watersheds, dam failure analyses, bridge scour evaluations, stormwater management, and the hydraulic modeling of natural and man-made waterways. Has extensive experience in the procurement of NJDEP stream encroachment, individual freshwater wetlands, U.S. Army Corps of Engineers, and FEMA permits for transportation projects. Proficient in numerous computer applications, including HEC-1, HEC-2, HEC-RAS, HY8, TR-55, TR-20, and NWS DAMBRK.

RELEVANT PROJECT EXPERIENCE

NJDOT NJ ROUTE 35/VICTORY BRIDGE REPLACEMENT, MIDDLESEX COUNTY, NJ

Hydraulic Engineer responsible for designing the roadway storm drainage system and soil erosion and sediment controls and preparing stormwater management plans for roadway improvements associated with the replacement of the existing **bridge over the Raritan River** with a new 1,225-meter-long segmental bridge. The storm sewer was designed along an urbanized roadway corridor for approximately 2,000 linear meters, which included extensive underground utilities requiring significant efforts to eliminate conflicts. Designed detention/ water quality basins to comply with applicable regulatory requirements. Work required extensive scour analyses for the bridge piers using HEC-RAS.

NJDOT NJ ROUTE 18 EXTENSION, MIDDLESEX COUNTY, NJ

Hydraulic Engineer responsible for designing the roadway storm drainage system and soil erosion and sediment controls and preparing stormwater management plans. Developed complex hydraulic and hydrologic models along the Metlars Brook and the Raritan River watersheds. Developed a HEC-1 model that consisted of several subwatersheds for the Metlars Brook stream corridor to compute the discharges for up to a 100-year storm event. Developed a HEC-RAS hydraulic model about 1 mile in length for 9 river reaches and 11 stream crossings to determine inundation limits, hydraulic properties for a new bridge, and flood routing at bridges and compute scour depths at bridge piers and abutments. Applied for and received modifications to the existing state-adopted floodway limits along the Raritan River, which resulted in construction savings of more than \$1 million. Responsible for **obtaining regulatory approvals from NJDEP for a major stream encroachment permit, a waterfront development permit, and an individual freshwater wetland permit**. The stream encroachment permit included demonstrating compliance with regulations governing the proposed 11 stream crossings, retaining walls within a floodplain, net fill, floodway modifications along the Raritan River, the delineation of the floodway and floodplain limits along Metlars Brook, and stormwater management.

NJDOT PHASE II BRIDGE SCOUR EVALUATIONS, VARIOUS LOCATIONS, NJ

Discipline Manager responsible for the **hydrologic and hydraulic analyses** needed to perform Phase II scour evaluations on nine riverine and tidal bridges throughout New Jersey. Responsibilities included determining

RAMESH RAJAGOPAL, PE DISCIPLINE LEAD – HYDRAULICS/HYDROLOGY RELEVANT PROJECT EXPERIENCE (CONT.)

flows and developing hydraulic models at the bridge locations. Developed geographic information system (GIS)-based hydrologic modeling, tidal prism calculations to determine tidal flows, and HEC-RAS hydraulic models for computing scour variables.

NJDOT NJ ROUTE 173 OVER THE MUSCONETCONG RIVER, HUNTERDON AND WARREN COUNTIES, NJ

Hydrology and Hydraulics Team Leader for the final design of this Pipeline 3 bridge redecking project. This \$2 million project included replacing the deck and parapet of a three-span bridge, supported on concrete-encased steel girders, over the Musconetcong River with associated guide rail replacement. Design elements were simplified to expedite the project schedule by obtaining an exemption from the NJDEP permits, consisting of the flood hazard area permit and a freshwater wetlands permit. Responsible for conducting hydraulic and hydrologic analyses and procuring permit approvals for the project. Roadway drainage design included performing water spread analyses, flood routing calculations, and storm sewer hydraulic computations. Best management practices were addressed by maintaining the roadway umbrella sections. Surface treatment under the proposed guide rails was modified to eliminate the overall impervious areas within the project limits and be within the maximum allowable threshold, which would have required NJDEP permit approvals.

NJ TRANSIT NJ ROUTE 139 TRAFFIC MITIGATION, LIBERTY STATE PARK PARK-AND-RIDE, JERSEY CITY, NJ

Environmental Engineer for the conceptual lighting layout for the Liberty State Park Hudson-Bergen Light Rail Station. NJ Transit proposed the construction of additional parking at this facility to mitigate traffic congestion during the rehabilitation of NJ Route 139. A site for this additional parking was identified north of Johnston Avenue and adjacent to the New Jersey Turnpike. This site was between an elevated portion of the New Jersey Turnpike, just northeast of Exit 14C, and several rail lines. Responsibilities included developing stormwater management design alternatives and identifying and coordinating applicable permits. Permits coordination included a waterfront development permit, a freshwater wetlands general permit, and a soil erosion and sediment control permit.

PITMAN SUBSTATION BULKHEAD REPLACEMENT, GLOUCESTER COUNTY, NJ

Hydraulics and Hydrology Permitting Task Manager responsible for performing an initial site investigation, preparing an alternatives analysis, and developing an environmental permitting scope as part of a team for a bulkhead replacement at an existing electrical substation. Also responsible for performing wetland delineation and for coordinating NJDEP Freshwater Wetlands and Flood Hazard Area permit applications.

NJDOT PULASKI SKYWAY CONTRACT 2, JERSEY CITY, NJ

Hydraulics and Hydrology Team Leader for final design services for the rehabilitation of the NJ Route 139, 3,200-footlong, Hoboken Viaduct that forms a link between the Pulaski Skyway and the Holland Tunnel in Jersey City, New Jersey. Rehabilitation to the structure consists of full superstructure replacement, as well as replacement or repair of existing substructure units including seismic retrofit. Proposed work will include geometric, safety, and drainage improvements. The estimated construction cost is more than \$145 million. Responsible for the drainage design, which included performing stormwater drainage spread calculations and developing a stormwater management plan, as well as storm sewer systems (scuppers) for conveyances. Performed drainage design using TR-55, HEC-12, and Hydroflow. Coordinated the drainage system construction details with structures. Stormwater measures were investigated for water quality adherence. Work was performed in compliance with the NJDOT Procedures Manual, the NJDEP Stormwater Management Regulations, the NJDOT Drainage Standard Specifications, and the NJDOT Soil Erosion and Sediment Control Standards.

OCEAN DRIVE (C.R. 619) SCOUR DAMAGE REPAIRS, UPPER TOWNSHIP, CAPE MAY COUNTY, NJ

Hydraulic Engineer for an environmental assessment study and final design services to address beach scour along Ocean Drive near Corson's Inlet. The improvements were proposed to repair past scour damage, restore beach and wetland areas, and provide protective measures to prevent future scour damage and roadway flooding. Tasks involved a field survey and mapping; environmental, geotechnical, hydraulic, and structural assessments and designs; meetings with federal and state permitting agencies; and permit application and construction contract bid document preparation.

LIRR LONG ISLAND CITY DIESEL YARD, LONG ISLAND, NY

Hydraulic Engineer responsible for the drainage design for the reconstruction of the existing Long Island City Diesel Yard. The design of the new yard includes 12 tracks, as well as an inspection track with a pit, for the storage, servicing, and light maintenance of dual-mode, locomotive-hauled and electric trains. Permit procurement included a New York City Department of Environmental Protection drainage approval for the overall site improvements.

STEPHEN A. ZAPOTICZNY, PE DISCIPLINE LEAD – SITE/CIVIL



REGISTRATION

Professional Engineer: NJ

EDUCATION

B.S.C.E., 1983, Rutgers, The State University of New Jersey

YEARS EXPERIENCE

Total Years: 10

With Gannett Fleming: 10



SUMMARY BIOGRAPHY

Stephen Zapoticzny is a *Civil Engineer* responsible for the design and checking of highway and transit tasks, including geometrics, grading, roadside safety, drainage, utilities, construction cost estimates, and earthwork calculations.

RELEVANT PROJECT EXPERIENCE

NJ TRANSIT NEWARK PENN STATION EXTERIOR CIRCULATION IMPROVEMENTS, NEWARK, NJ

Project Engineer for the final design of an estimated \$10 million in improvements to the roadways surrounding historic Newark Penn Station. Tasks include roadway design, detailed grading, drainage, and details. Led the quantity calculation and cost estimation task for the final submission and is leading the effort for construction-related services. The improvements include a midblock roundabout, curbside pick-up/drop-off pullouts, upgrades to five signalized intersections, a reversible bus lane with lane-use signals on Raymond Boulevard, a security bollard system, extensive traffic-calming measures, and extensive architectural and aesthetic treatments consistent with the characteristics of the historic station.

NJ TRANSIT PORTAL BRIDGE CAPACITY ENHANCEMENT, NEWARK, NJ

Site/Civil Engineer responsible for the right-of-way design for the enhancement of a railroad bridge over the Hackensack River that included design, engineering, and construction assistance. Work involved reconfiguration of the corridor and associated interlockings over approximately 2.5 miles through the environmentally sensitive Hackensack Meadowlands. The project was successfully advanced by the team through an accelerated environmental impact statement effort, requiring detailed coordination with multiple project stakeholders. The enhancement involved the resolution of significant environmental issues, including land acquisition, wetlands, contaminated sites, and landfills. It also included the design of 29 bridges with 124 spans and related civil, track, signal, catenary, and electric-traction substation design work. The new river crossings will consist of two three-span tied-arch bridges to provide a 50-foot clearance over the water. There will also be a duck-under structure, where westbound New Jersey Transit trains leaving New York through the new tunnel will pass under the Amtrak Northeast Corridor. Given the critical importance of this heavily travelled corridor, detailed constructability reviews are underway, and detailed construction staging will be developed to minimize impacts to operations during construction.

NJTA INTERCHANGE 6 TO 9 WIDENING PROGRAM, SECTION 3, BURLINGTON/MERCER COUNTY, NJ

Civil Engineer for the initial highway design from approximately Milepost 56.5 to 59.7, a total of 3.2 miles. The section includes normal turnpike widening with 26-foot medians in the vicinity of the Maintenance District 3 facility, in addition to the ramp connections and mainline widening necessary for connections to Service Areas 6N and 6S. The northern terminus of the section maintains a widened 75-foot median between the inner and outer roadways to meet the widened section for Interchange 7A. The preliminary construction cost estimate is \$200 million. Performed roadside and horizontal and vertical geometric design for the southbound roadways and ramps.

STEPHEN A. ZAPOTICZNY, PE DISCIPLINE LEAD – SITE/CIVIL

RELEVANT PROJECT EXPERIENCE (CONT.)

NJDOT ROUTE 18, SECTIONS 2F, 7E, AND 11H, MIDDLESEX COUNTY, NJ

Highway Designer responsible for providing design services for a \$140 million multi-interchange project, involving the total reconstruction and widening of 2.1 miles of NJ Route 18 to grade-separate one interchange and construct collector-distributor roadways. The project included 4 new roadway bridges, 2 new pedestrian bridges, a pedestrian tunnel replacement, a new culvert, 27 new retaining walls, 7 new noise walls, 16 new sign structures, a bulkhead replacement, a historical wall rehabilitation, 6 new or upgraded traffic signals, an extensive new intelligent transportation system, and substantial utility relocations. In addition, the project required relocating a historic house; constructing additional parkland for the City of New Brunswick, including a public boat launching facility; reconfiguring an existing public park to include an amphitheater and picnic pavilion; and involved the extensive use of streetscape elements. The project was developed through an intensive context-sensitive design approach that included regular community partnering meetings and public outreach efforts.

AMTRAK CONDUIT SYSTEM AND CABLE INSTALLATION, METUCHEN TO EDISON, NJ

Project Highway Designer responsible for installing two additional 138 kV transmission circuits in an underground conduit system to expand generating capacity at Metuchen and to allow the two existing aerial and two new underground mainline circuits to be fed simultaneously. Provided conceptual and preliminary design for the conduit system and cable installation from the Metuchen step-up yard to Amtrak's mainline transmission network at Milepost 25.1 in Edison. Tasks included developing the horizontal and vertical design of the conduit system, developing design plans, and providing construction-related services.

NJDOT NJ ROUTE 18 EXTENSION, SECTION 3A, MIDDLESEX COUNTY, NJ

Project Highway Designer for the preliminary engineering and design development for the extension of NJ Route 18 from the Section 2A terminus at Hoes Lane to I-287. The \$40 million project included the widening and rehabilitation of 2.5 miles of land service highway, along with improvements for 20 at-grade intersections. The project contained three new bridge structures, two culverts, and five retaining walls. It also included more than 4 miles of bikeway design; extensive local roadway, driveway, and parking lot improvements; hydraulic analyses; seven traffic signals; and right-of-way document preparation for 70 parcels. Activities included horizontal design, vertical design, utility work, and traffic control and staging design.

NJDOT U.S. ROUTES 1 AND 9, SECTIONS 1K AND 3M, MIDDLESEX AND UNION COUNTIES, NJ

Highway Engineer responsible for designing horizontal and vertical geometry for a 1.8-mile highway realignment. The project consisted of realigning the highway to meet a new bridge over the Rahway River, which was built under a separate contract. The work included the total reconstruction and widening of the roadway, one roadway bridge replacement, three new retaining walls, two new culverts, and new and modified signalized intersections.

Request For Proposal (RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the **DADITANI DIM**

RARITAN RIVER DRAWBRIDGE





SECTION 5 Key Personnel Certifications & References





Section 5 Key Personnel Certifications





SECTION 5: KEY PERSONNEL CERTIFICATION & REFERENCES

5.1 Key Personnel Certification

We hereby certify that all key personnel proposed in this proposal is presently employed by the firms represented on this team. A full list of our proposed key personnel can be found in *Section 4: Qualifications of Individuals*. However, a list is provide below for your convenience.

Key Personnel	Role	Firm Employed By
Visha Szumanski, PE	Project Manager	Hardesty & Hanover
Paul Skelton, PE	Project Principal-in-Charge	Hardesty & Hanover
David Boaté, PE	Project Principal-in-Charge	Gannett Fleming
Steven Harlacker, PE, SE	Quality Assurance Manager	Hardesty & Hanover
Bruce Smith, PE	Quality Assurance Manager	Gannett Fleming
Richard Cross, PE	Deputy Project Manager – Track & Systems	Gannett Fleming
David Tuckman, PE	Deputy Project Manager – Bridge & Foundations	Hardesty & Hanover
Steven Hom, PE	Peer Review/Constructability	Hardesty & Hanover
Joseph Griffin, PE	Peer Review/Constructability	Griffin Engineering
Glen Schetelich, PE	Task Manager – Environmental	Hardesty & Hanover
Robert Matthews, PE	Task Manager – Civil	Gannett Fleming
David Howell, PE	Task Manager – Rail Systems	Gannett Fleming
Peter Roody, PE	Task Manager – Movable Bridge	Hardesty & Hanover
David Gerber, PE	Task Manager – Approach Spans	Hardesty & Hanover
Raymond Mankbadi, PE	Task Manager – Foundations & Geotech	Hardesty & Hanover







5.2 Firm References





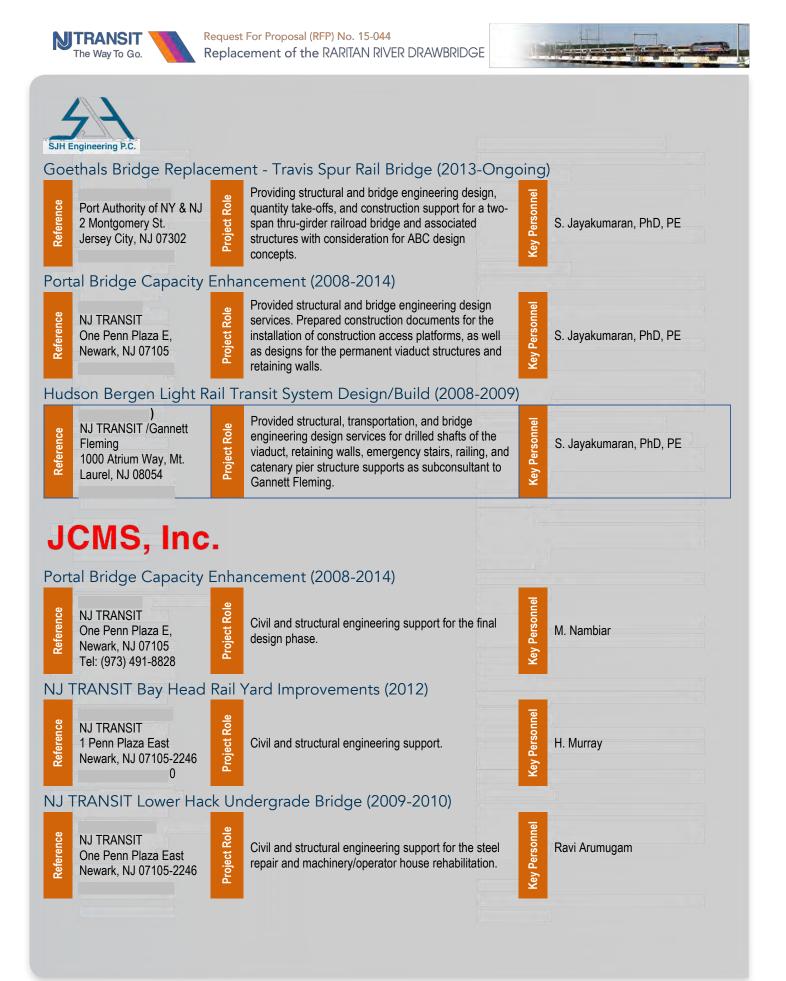








Hardesty &Hanover







Request For Proposal (RFP) No. 15-044 Replacement of the RARITAN RIVER DRAWBRIDGE

envision

SEPTA Silverliner Rail Car Procurement (2006-2014)





5.3 **Project Manager References**

PROJECT MANAGER: VISHA SZUMANSKI, PE

NJ TRANSIT Task Order Contract for Bridge & Railway Engineering (2006-2009)	

, Chief Engineer - Structures NJ TRANSIT One Penn Plaza East Newark, NJ 07105

Project Role

Project Manager responsible for overseeing this Task Order contract for bridge and railway engineering services systemwide. Tasks included rehabilitation of Morgan Draw Bridge on NJ Coast Line over Cheesequake Creek and rehabilitation of Navesink River Bridge in Red Bank on NJ Coast Line.

NJ TRANSIT Task Order Contract for Bridge & Railway Engineering (2006-2009)

Reference	Project Role			
New Jersey Transit	Project Manager for Secaucus Junction Platform Extension. Took over management of this task to address performance issues which were delaying completion of the project. Produced bid package and obtained all necessary approvals in time to complete the construction before the Super Bowl season.			
One Penn Plaza East, Newark, NJ 07105-2246				

NJ TRANSIT Task Order Contract for Bridge & Railway Engineering (2006-2009)

Reference	Project Role
MTA Bridges and Tunnels 2 Broadway New York, NY 10004	Project Manager for one of the largest TBTA capital improvement projects, which involved \$450 reconstruction of the RFK bridge toll plaza. Took over project management of this contract when it was put on hold for several months due to multimillion dollars budget overruns. Developed project mitigation plan and completed final design in only 9 months, within the
	budget.

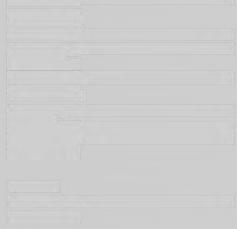
NJ TRANSIT Task Order Contract for Bridge & Railway Engineering (2006-2009)

Reference

New York City DOT 59 Maiden Lane New York, NY



Deputy Project Manager in a JV for a \$100M rehabilitation of 1400 ft. long Roosevelt Avenue Bridge and viaduct over Van Wyck Expressway and the Flushing River. The double-deck structure with 300 ft. long bascule span, carries Roosevelt Avenue on its lower deck and three tracks of the NYCT #7 Line on the top. Work included extensive coordination with NYCT and permitting/ approvals, including NYCDEP, NYSDEC, NYCDPR and Public Design Commission.









5.4 **Key Personnel References**



Ro Amtrak 30th Street Station Project Philadelphia, PA 19104

Rol

Project

Principal-in-Charge of the final design services the replacement of the railroad movable bridge carrying Amtrak's Northeast Corridor lines over the Niantic River.

Port River Bascule Bridges (2003-2008)

Transport South Australia Reference

Reference

, Project Manager

- 260 Elizabeth Street
- Slurry Hills, NSW 2010

Principal-in-Charge of the preliminary and final design of two new movable bridge. Oversaw the design of a new railroad movable bridge and a new highway bascule bridge providing a new connection into the Port.

Jacques Chaban-Delmas Vertical Lift Bridge (2005-2013)

, Design Manager EGIS/JMI Reference 11 Avenue du Centre Saint Quentin en Yvelines, 78286 Guyancourt Cedex, France

Principal-in-Charge for the design of \$146 million Chaban-Delmas Vertical Lift Project Role Bridge in Bordeaux, France, which features the longest lift span in Europe (383 ft.). The bridge has a lift height of 164 ft. and accommodates 320 ft. wide navigational channel. It was designed to carry four lanes of traffic, two bicycle/pedestrian paths and two light rail tracks.

PRINCIPAL-IN-CHARGE: David Boaté, PE

Sunnyside Yard Master Plan (2011-2015)

Director MTRAK 0th & Market Streets Philadelphia, PA 19104	Project Role	Project Manager for a joint venture for the redevelopment of an approximately 200 acre yard full-service storage and service & inspection and maintenance facility. The Master Plan focused on documenting existing conditions of infrastructure; transportation planning; programing to assess commuter needs, intercity, high speed rail, and maintenance of way service; and overbuild potential assessment.
(MTRAK 0th & Market Streets	MTRAK 22 Dth & Market Streets 22

NJ Transit Architectural/Engineering Task Order Contract (2012-ONGOING)

, Chief Engineer

- Reference NJ Transit One Penn Plaza East
- Newark, NJ 07105

Principal in Charge for a task Order Contract for architectural and engineering Ro Ro assignments. Assignments have included the assessment and resiliency and Project hardening design for six major substations sites; final design and construction support of the upgrade of the OCS systems on the Gladstone Line. Design for improvements at Newark City Subway Norfolk Station.

NJ Transit Rail Mapping, Video and GIS (2003-2009)

, Director, Capital Planning Reference NJ Transit One Penn Plaza East Newark, NJ 07105

Phase I Project Manager and Phase II Officer-in-Charge for the development of a Rol GIS system for NJ Transit commuter rail and light rail transit (LRT) systems based Project on LiDAR Survey and Oracle Database Management. The rail map system provides electronic GIS maps and both locomotive engineers-view and aerial video for the entire 465-mile NJ Transit commuter railroad network.







QUALITY ASSURANCE MANAGER: STEPHEN HARLACKER, PE, SE

I-84 Hartford-Aetna Viaduct – Phases I and II (2006 – Ongoing)

, Supervising Engineer

- **Connecticut DOT** <u>Reference</u>
- 2800 Berlin Turnpike
- Newington, CT 06111

During the tenure of this project, I have functioned in all roles from Lead Structural Project Role Engineer to Project Manager, including roles as Project Engineer and Internal Quality Manager. Phase I of this project included a Rehabilitation Study Report, Preliminary Design, Final Design, and Construction Support. Phase II is currently between Preliminary and Final Design at this time.

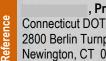
Grand Avenue Bridge Rehabilitation (2009 – Ongoing)

, Chief Structural Eng.

- Reference City of New Haven
- 200 Orange Street, Fifth Floor New Haven, CT 06510

Project Engineer, responsible for movable bridge and fixed approach span design Project Role for his Swing Bridge Rehabilitation Project. This project is currently between Preliminary and Final Design. On prior engagements with Mr. Moslehi, I served as the Project Engineer on the New Haven On-Call Movable Bridge Contract and the Ferry Street Bridge Major Rehabilitation.

Norwalk River (WALK) Bridge Replacement (2015 – Ongoing)



, Project Manager, Fac./Transit 2800 Berlin Turnpike

Newington, CT 06111



Role

Project

Lead Structural Reviewer for the movable span as part of the Owner's Independent Peer Review team for the Norwalk River (WALK) Railroad Bridge Replacement Project. This high-priority project is being delivered by the CMGC process.

QUALITY ASSURANCE MANAGER: Bruce Smith, PE

Southwest Corridor Light Rail Transit (2013-2014)

Project Manager (KHA) Metropolitan Council / Kimley-Horn & Assoc. 2550 University Ave West,

Reference St. Paul, MN 55114

Project Rol QA Manager for the development and preparation of 30% design documents of a proposed Light Rail Transit system, east segment, Minneapolis to Hopkins, Minneapolis

National Capital Purple Line Light Rail General Engineering Consultant (2011 - 2012)

Ro Solution

- , Quality Manager Maryland Transit Administration 6 Saint Paul Street
- Baltimore, MD 21201

Served as project Quality Manager. Prepared Quality Management Plan and Role supporting procedures and QA forms. The PLGEC quality management system Project was based on the requirements of the Federal Transit Administration's (FTA) Quality Assurance and Quality Control Guidelines, dated February 2002, FTA-IT-90-5001-02.1.

Portal Bridge Capacity Enhancement Project (2008 - 2013)



Reference

, Sr. Program Manager NJ Transit One Penn Plaza East, Newark, NJ 07105

QA Manager for developing the design and preparing the technical contract documents for a major bridge replacement project and the related rail systems on Project Amtrak's Northeast Corridor.







PEER REVIEW/CONSTRUCTABILITY: Steven Hom, PE

Niantic Bridge Replacement Project (2006-2013)









DEPUTY PROJECT MANAGER - TRACK & SYSTEMS: Richard Cross, PE



Reference

Sr. Program Manager NJ Transit One Penn Plaza East, Newark, NJ 07105 ord bro project Role bro

Provided engineering services including three miles of track realignment, signals, catenary, geotechnical evaluation as well as the Operations Analysis for the project.

Niantic Bridge Replacement Project (2006-2013)

Amtrak 30th Street Station Philadelphia, PA 19104 Final Engineering services for the east and west approaches including two miles of track realignment, signals, catenary, pre-cast concrete retaining walls as well as all geotechnical analysis for the project.

Sawtooth Bridge Conceptual Study (2013-2014)



Project Role

R S

Project

Ro

Project

Conceptual design for two aging, heavily used bridges on the Northeast Corridor traversing over four New Jersey Transit mainline tracks.

Deputy Project Manager / Senior Structural Engineer for the replacement design

of a new movable bridge. Coordinating the multi-disciplanary design team for the

development of concepts through final design.

DEPUTY PROJECT MANAGER – BRIDGE & FOUNDATIONS: David Tuckman, PE

NYCDOT Unionport Bridge Replacement (2013-Ongoing)

Reference

, Project Manager New York City DOT 59 Maiden Lane, 35th Floor

New York, NY 10038-4502

Port River Bascule Bridges (2003-2008)

Transport South Australia 260 Elizabeth Street Slurry Hills, NSW 2010 Structural Engineer for the preliminary and final design of two new movable bridge. Provided structural design support for the design of a new railroad movable bridge and a new highway bascule bridge providing a new connection into the Port.

MBTA Saugus River Drawbridge Rehabilitation (2012)

Project Director

Reference

Mass Bay Transportation Authority 500 Arborway Jamaica Plain, MA 02130 Project Engineer for emergency repairs of a vintage Saugus River Drawbridge carrying two tracks of MBTA commuter rail. Inspection conducted by H&H revealed severe deterioration of the rest pier.







TASK MANAGER – PERMIT SUPPORT: Glen Schetelich, PE

NJTA Garden State Parkway over Great Egg Harbor (2014-Ongoing)

, Supervising Engineer

- New Jersey Turnpike Authority N.J. Turnpike at Woodbridge
- <u>Reference</u> Woodbridge, NJ 07095

Freehold, NJ 07728

1035 Parkway Avenue

Trenton, NJ 08625

Project Manager in charge of delivery of Final Plans, Environmental Permits and Project Role Construction Support for a \$200M replacement of 47-span, 3,671-foot-long bridge over Great Egg Harbor Bay and a new 800-foot bridge over Drag Channel. Key issues involved staging of construction within the constraints of ecologically complex and environmentally-sensitive area.

S-31 Oceanic Bridge Bascule Span Rehabilitation (2009-2013)



Reference

, PE, County Engineer Monmouth County Engineer's Office 1 East Main Street, Third Floor

Principal-In-Charge responsible for overseeing in-depth inspection, structural Project Role ratings, prioritizing the repairs and development of rehabilitation plans for a double-leaf bascule bridge. Responsible for the overall supervision of the design team, obtaining permits and approvals, coordination with the client and overseeing the subconsultants.

Route 1&9T (25) over St. Pauls Avenue (2005-2013)

, Dir. Project Management New Jersey DOT



Project Manager in charge of Preliminary Plans, Final Plans, Environmental Assessment Document, Environmental Permits and Construction Support.

TASK MANAGER – CIVIL: Robert Matthews, PE

NJTA GSP Widening Interchange 30 to 63 Program, MP 47.7 to 51.3 (2009-Ongoing)



Supervising Engineer NJ Turnpike Authority

581 Main Street

Woodbridge, NJ 07095

Project Manager for the final design of approximately 3.6 miles of roadway Ro widening on the GSP. Project includes the construction of an additional travel lane Project in the northbound and southbound directions, reconstruction of shoulders, a new drainage system, highway lighting, utility relocations, and reconstruction of Interchanges 48 and 50 with new overpass structures and retaining walls.

NJTA GSP Interchange 142 Improvements (2004-2012)

, PE, Project Manager

, Project Engineer

Reference New Jersey DOT 1035 Parkway Avenue Trenton, NJ 08625

Deputy Project Manager and Civil Task Leader for the preliminary and final design Ro of this interchange improvement project, which involved the implementation of Project new ramp connections from GSP southbound to I-78 eastbound and from GSP northbound to I-78 westbound.

NJ Turnpike Interchange 14A Improvements (2010-Ongoing)

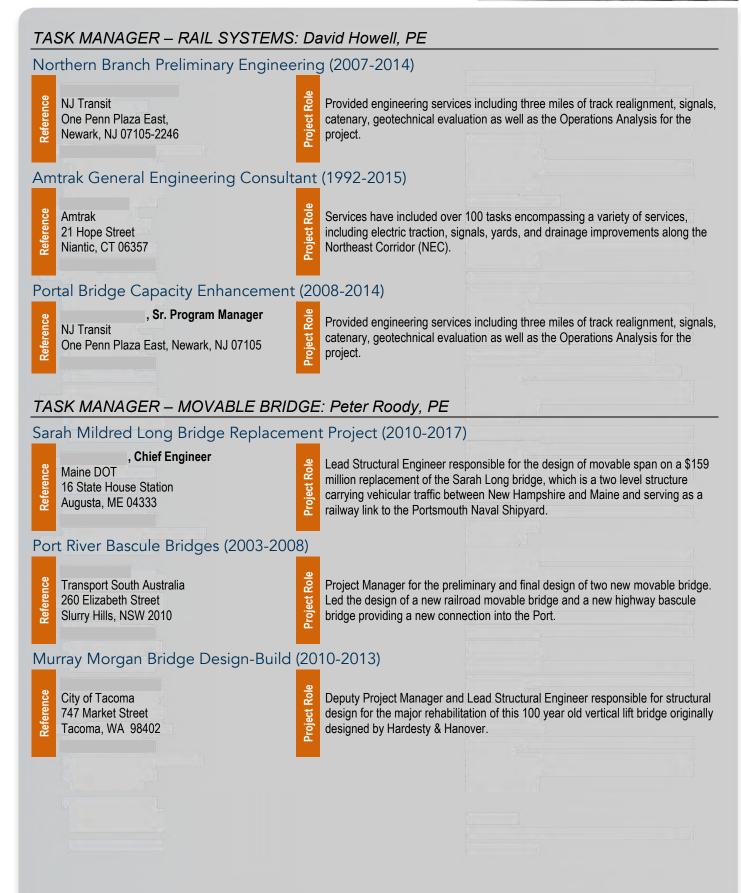
- erence
- NJ Turnpike Authority 581 Main Street
- Woodbridge, NJ 07095

So S Design Manager and Civil Task Leader for preliminary engineering, environmental Project studies, and final design for improvements to the Turnpike at Interchange 14A, located at the border of Bayonne and Jersey City in Hudson County.















TASK MANAGER – APPROACH SPAN: David Gerber, PE



NJ Transit One Penn Plaza

- Reference Newark, NJ 07105

Lead Geotechnical Engineer responsible for a feasibility study for the replacement of a 100-year old Brielle Movable Bridge on the NJ Transit Coast Line. Recommendations include ground improvement on the approaches using Controlled Modulus Columns (CMC) or Vibro Concrete Columns (VCC).

NJ Transit Roebling Embankment Failure (2011-2012)

Project

Rol

Project |

Asst. Chief Eng. - Structures

- Reference NJ Transit
- One Penn Plaza
- Newark, NJ 07105

Lead Geotechnical Engineer for emergency repairs to 300 long section of 55 ft. Project Role high embankment between the Roebling and Bordertown NJ Transit stations, which collapsed as a result of hurricane Irene causing disruptions to rail operations. The work involved fast track investigation, testing, design and construction - all of these activities to be completed within a six month period.

NYCDOT Willis Avenue Bridge Replacement (2007-2010)

, Project Engineer

- erence New York City DOT
- 59 Maiden Lane, 35th Floor

New York, NY 10038

Lead Geotechnical Engineer for the \$612 million off-line replacement of a major 345-foot-long, swing bridge and 3,000 feet of approaches. Oversaw all geotechnical work including extensive subsurface/subsoil exploration program, development of geotechnical recommendations/report and design of the new bridge foundations, which included drilled shafts, steel H-piles, and mini piles.







5.5 Work History with New Jersey Transit

Hardesty &Hanover

difutiover	
PROJECT INFORMATION (H&H)	REFERENCE INFORMATION
NJ Transit Task Order Contract (2003-2006)	NJ Transit
Hardesty & Hanover provided engineering services for this New Jersey Transit task	
order contract. Tasks included superstructure replacement of the Jonathan's Creek	
Thorofare Bridge and bridge inspection services.	
Key Personnel: Glen Schetelich	
NJ Transit Group F Undergrade Bridges (2003-2005)	NJ Transit
Hardesty & Hanover provided structural condition inspection and review/update of	No transit
the load ratings for 36 New Jersey Transit Group F undergrade, commuter railroad	
bridges at various locations.	
Key Personnel: David Gerber	
	N I Torra 14
Newark Drawbridge Replacement (2004-2009)	NJ Transit
Hardesty & Hanover, as a subconsultant, performed design and construction support	
services for major structural and mechanical rehabilitation of a railroad swing span	
and approach span.	
Key Personnel: Peter Roody, David Gerber, Steve Hom, Steve Mikucki, Alec Noble	
Undergrade Movable Bridge Inspections - 06-084 (2006-2008)	NJ Transit
Hardesty & Hanover performed structural, mechanical and electrical, in-depth	
inspection and subsequent report of six active movable bridges, two inactive	
movable bridges and eight fixed bridges, all carrying active railroad lines.	
Key Personnel: Peter Roody, David Gerber, Steve Hom, Steve Mikucki, Alec Noble	
TOC for Bridge and Railway Engineering (2008-2010)	NJ Transit
Hardesty & Hanover, as a subconsultant, provided professional services for on-call	
bridge and railroad assignments as requested by NJ Transit, of up to \$500,000	
professional fee per assignment.	
Key Personnel: Glen Schetelich	
Undergrade Bridge Inspection – Contract 09-108 (2009-2012)	NJ Transit
Hardesty & Hanover performed field inspection of 50 New Jersey Transit Bridges. In	
addition to the structural inspections, diving inspections on 6 bridges we also	
performed.	
Key Personnel: Glen Schetelich	
Emergency Repair of the Roebling Embankment Failure – River Line Light Rail	NJ Transit
(2010-2011)	
Hardesty & Hanover performed the emergency investigation and repair design for	
this embankment failure on NJ Transit's River Line.	
Key Personnel: Glen Schetelich, Ray Mankbadi	
Undergrade Movable Bridges - Group C (2012-2014)	NJ Transit
Hardesty & Hanover obtained this contract to perform bridge inspection services.	No Transit
Key Personnel: Glen Schetelich, Paul Connolly, Stephen Mikucki, Alec Noble,	
David Marcic	
Brielle Drawbridge Replacement Study (2014-present)	NJ Transit
Hardesty & Hanover provided conceptual design for the replacement of the existing	
single track with a bascule span and approach spans with a new two track on the	
existing alignment within the ROW due to property constraints	
Key Personnel: David Gerber, Peter Roody, Glen Schetelich, Paul Connolly,	
Stephen Mikucki	







🎽 Gannett Fleming

PROJECT INFORMATION (GF)	REFERENCE INFORMATION
Supply Conceptual Engineering Services (2015-2016)	NJ Transit
Gannett Fleming, as a subconsultant, is providing supply conceptual engineering	
design services for the replacement and construction of undergrade bridge 5.48 HX	
draw on the Bergen County Line and over the Hackensack River in Secaucus,	
Hudson County, New Jersey.	
Key Personnel: R.Cross, D. Howell, S. Sibley Brielle Drawbridge Engineering Services (2014-2015)	NJ Transit
GFT&RS, performing as a subconsultant, is providing consulting engineering	NJ Hallsit
services for the Brielle Drawbridge replacement and to support railway design,	
railway cost estimating, environmental, permitting, and geographic information	
systems (GIS) for New Jersey Transit Corporation.	
Key Personnel: J. Legath, R. Cross, S. Wittig, R. Rajagopal, R. Lentz, G. Nazarow	
GIS Loader (2014-2014)	NJ Transit
Enhancements to the NJT GIS Loader Tool.	
Key Personnel: R. Metzger, N. Reck, B. Robertson	
NEC Mid Line Lean Design (2014 2015)	
NEC Mid-Line Loop Design (2014-2015) Design, engineering, and construction services for the Northeast Corridor Mid-Line	NJ Transit
Loop project for the New Jersey Transit in North Brunswick, New Jersey.	
Key Personnel: D. Johnson, Y. Shayer, P. Buxhoeveden	
Elevator and Escalator Consulting Services (2013-2014)	NJ Transit
Elevator and escalator consulting services, on an as-needed basis, through an	
open-end contract with the New Jersey Transit Corporation.	
Key Personnel: R. Keller, P. McVicker, P. Welch	
General Architectural and Engineering TOC Number 13-006A (2013-2016)	NJ Transit
Gannett Fleming is providing New Jersey Transit, on a task order basis, general	
architectural and engineering services. Key Personnel: D. Boate, M. Morgan	
Mount Arlington Station Elevator Field Audit and Survey (2013-2014)	NJ Transit
VTX, a division of Gannett Fleming, is conducting an emergency field audit and	
survey on the hydraulic elevator at the Mount Arlington Station for the New Jersey	
Transit, as part of an open-end contract. For this task order, our firm is verifying the	
jack condition reported by the elevator service provider and reporting our findings.	
Key Personnel: R. Keller, S. Fitzgerald, P. Welch	
Gladstone Line Overhead Contact Systems - Catenary Pole Replacement	NJ Transit
(2013-2016)	
Transit & Rail Systems, a division of Gannett Fleming, is providing final design,	
engineering, and construction support services to the New Jersey Transit for the catenary pole replacement project in Gladstone, New Jersey.	
Key Personnel: D. Marker, M. Patcha, T. Shantz	
- Planning, Design, Engineering, and Construction	NJ Transit
Assistance Services (2013-2016)	
Gannett Fleming is providing planning, design, engineering, and construction	
assistance services to the New Jersey Transit for the repair, reconstruction or	
replacement of various general power substations, traction power substations,	
switching substations, and related facilities at Hoboken Terminal/Yard, Meadows	
Maintenance Complex and Bay Head Yard operating locations that were damaged	
as a result of Hurricane Sandy in October 2012.	
Key Personnel: T. Bandy, S. Zapoticzny, D. Lind	







PROJECT INFORMATION (GF)	REFERENCE INFORMATION
Howell Bus Facility Upgrade (2013-2015)	NJ Transit
Gannett Fleming is providing services for the replacement and upgrade of the	
compressed natural gas compressor and fueling station at the New Jersey Transit	
lowell Township bus facility.	
Key Personnel: E. Briner, B. Margerum, B. Mummert	
Bloomfield Tunnel - Elevator and Escalator Consulting Services (2013-2013)	NJ Transit
TX, a division of Gannett Fleming, is providing New Jersey Transit with elevator	
nd escalator consulting services. This task order is to perform design and	
onstruction support services for one new elevator at the Bloomfield Station.	
Key Personnel: R. Keller, P. McVicker, P. Welch	
Elevator and Escalator Maintenance Audit and Report (2013-2013)	NJ Transit
TX, a division of Gannett Fleming, is performing a maintenance audit and preparing	
report for 19 escalators and 20 elevators at Newark Penn Station for New Jersey	
ransit.	
Key Personnel: R. Keller, S. Fitzgerald, P. McVicker	
ew Jersey Transit River Line Drafting Services (2012-2013)	NJ Transit
ransit & Rail Systems, a division of Gannett Fleming, is providing engineering	
ervices to update track maintenance charts.	
Key Personnel: E. Breslin, J. Lech, R. Hallahan	
ewark Penn Station Escalator Field Survey (2012-2013)	NJ Transit
TX, a division of Gannett Fleming, is providing New Jersey Transit with escalator	ino mansit
onsulting services. Our firm is conducting a field survey of the storm aftermath	
ondition of escalators 34 and 35 at Newark Penn Station.	
Key Personnel: R. Keller, S. Fitzgerald, P. Welch	
Elevator and Escalator Consulting Services (2012-2014)	NJ Transit
(TX, a division of Gannett Fleming, is Performing a site inspection and field survey	
n the vertical transportation units at the Secaucus Junction Station sustaining flood	
amage due to Hurricane Sandy and provide a written assessment of the findings.	
looding impacted machinery pits for nine of the 31 escalators and six of the 12	
levators.	
Key Personnel: R. Keller, S. Fitzgerald, P. Welch	
Open-End Elevator and Escalator Consulting Services (2012-2014)	NJ Transit
TX, a division of Gannett Fleming, is providing open-end elevator and escalator	
onsulting services to New Jersey Transit. Tasks include providing construction	
spection services, including preparing written reports of each inspection	
ssessment, for two elevators at the Hudson-Bergen Light Rail Transit Port Imperial	
tation in Weehawken, New Jersey.	
ey Personnel: R. Keller, P. McVicker, P. Welch	
onsulting Services for Enhancements to Farebox Recovery Tool (2012-2013)	NJ Transit
eoDecisions, a division of Gannett Fleming, is providing New Jersey Transit with	
onsulting services to enhance the farebox recovery tool.	
ey Personnel: R. Marsters, N. Reck, R. Metzger	
ecaucus Junction Station- Consulting Services for Escalators (2012-2012)	NJ Transit
TX, a division of Gannett Fleming, is providing open-end consulting services to	
ew Jersey Transit on a task order basis. Our firm is performing a field survey on	
ree escalators at the Secaucus Junction station; determining the necessity of	
roposed repairs; and providing a written assessment.	
ey Personnel: R. Keller, P. McVicker, P. Welch	







PROJECT INFORMATION (GF)	REFERENCE INFORMATION
Portal Bridge Capacity Enhancement Project (2008-2014)	NJ Transit
Gannett Fleming Transit & Rail Systems is leading a tri- venture, with 27	
subconsultants to design the replacement of 2.5 miles of the Amtrak Northeast	
Corridor between Newark, NJ and New York City. This corridor is the most heavily	
travelled railroad in the country carrying both Amtrak's high-speed intercity service	
and NJ TRANSIT's commuter service.	
Key Personnel: M. McNamara, T. Shantz, R. Cross, D. Howell, J. Legath, J. Lech,	
G. Nazarow	
Market Street Bus Garage Open-End Elevator and Escalator Consulting	NJ Transit
Services (2011-2012)	
VTX, a division of Gannett Fleming, is providing open-end elevator and escalator	
consulting services to New Jersey Transit. Our firm is providing plans, specifications,	
and procurement support for the new elevator systems to be installed at the Market Street (Paterson) bus garage. Scope includes installation, construction-inspection	
services, acceptance testing, warranty services, and repair/maintenance verification.	
Key Personnel: R. Keller, P. McVicker, P. Welch	
Elevator and Escalator Consulting Services (2010-2011)	NJ Transit
VTX, a division of Gannett Fleming, is providing open-end elevator and escalator	וזט וומווסונ
consulting services for New Jersey Transit. As part of this project, our firm is	
conducting a condition assessment on one escalator No.17 at Secaucus Junction	
Station to identify any operating deficiencies.	
Key Personnel: R. Keller, P. McVicker, P. Welch	
Condition Assessments for Rail Line Station Elevators and Escalators (2010-	
2012)	
VTX, a division of Gannett Fleming, is conducting a follow-up condition assessment	
of rail line station elevators and escalators for New Jersey Transit. Our firm is	
verifying repairs made in response to previous findings, identifying any new safety or	
reliability deficiencies, and preparing a revised contract specification for the repair	
and maintenance of 45 elevators and three escalators.	
Key Personnel: R. Keller, P. McVicker, P. Welch	
Task Order 18 - South Amboy Station Elevator Installation (2010-2010)	NJ Transit
Task Order 18 - South Amboy Station Elevator Installation.	
Key Personnel: R. Keller, P. McVicker, P. Welch	
Task Order 16 - New Brunswick Rail Station Catenary Structure Clearances	NJ Transit
(2010-2010)	
Gannett Fleming is providing open-ended elevator and escalator consulting services	
to New Jersey Transit. Task Order 16 involves verifying catenary structure	
clearances for the New Brunswick Rail Station.	
Key Personnel: T. Shantz, M. McNamara, C. Thompson	
Positive Train Control Implementation (2010-2013)	NJ Transit
Gannett Fleming is providing technical support services to New Jersey Transit for	
the implementation of a positive train control system (PTC) on all of its commuter rail	
lines. A PTC will extend that protection, which prevents train-to-train collisions to	
operations at speeds lower than 20 mph and will automate functions that are	
currently completed manually. The Rail Safety Improvement Act of 2008 mandates	
the implementation of a PTC system on all rail lines by the end of December 2015.	
Key Personnel: S. Eck, R. Hallahan, M. McNamara, D. Prichard, J. Samean	N I Transit
New Brunswick Rail Station Escalator Replacement (2009-2012)	NJ Transit
VTX, a division of Gannett Fleming, is providing elevator and escalator consulting	
services to New Jersey Transit. The project includes the design, construction, and warranty services for the replacement of an escalator at the New Brunswick rail	
station.	
Key Personnel: R. Keller, G. Tulumello, R. Kaowalski	







PROJECT INFORMATION (GF) **REFERENCE INFORMATION** New Brunswick Rail Station Elevator Upgrades (2009-2012) NJ Transit VTX, a division of Gannett Fleming, is providing elevator and escalator consulting services to New Jersey Transit. The project includes the design, construction, and warranty services for the upgrade of two elevators at the New Brunswick rail station. Key Personnel: R. Keller, R. Kowalski, P. McVicker, T. Tulumello Architectural and Engineering Services (2009-2013) NJ Transit Gannett Fleming is providing various architectural and engineering services to New Jersey Transit, including civil engineering, mechanical engineering, architecture, electrical engineering, electronics, transportation engineering, cost estimating, value engineering, energy conservation and management, environmental engineering, industrial engineering, and project administration. Key Personnel: D. Boate, M. Morgan, S. Sibley Washington Street Station Elevator and Escalator Consulting Services (2008-NJ Transit 2011) VTX, a division of Gannett Fleming, will provide engineering, testing, and inspection services to ensure the proper design, construction, installation, and warranty repair/maintenance for the upgrade of two elevators at the Washington Street Station on Newark City Subway. Our firm will inspect and approve the work, includes periodic construction inspections, acceptance testing, and warranty/maintenance verification.

Key Personnel: R. Keller, P. McVicker



Request For Proposal (RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the

RARITAN RIVER DRAWBRIDGE



section 6 Technical Section











SECTION 6: TECHNICAL SECTION

6.1 Project Understanding & Key Issues

The objective of this project is to **replace the Raritan River Drawbridge** which carries NJ TRANSIT's North Jersey Coast Line, with a new resilient movable bridge that will be more reliable, require less maintenance and stand the test of time. While this bridge provides a direct link between the developing communities of Perth Amboy and South Perth Amboy, it is also a major connection for coastal New Jersey residents to metropolitan New York. The upstream bridges were replaced over the recent years in order to provide unfettered channel access for major cruise and freight ships. The replacement of this bridge is the last piece to enhancing the safe and efficient passage of these vessels and provide an economic stimulus to the region and all New Jersey.

The key design challenges will be to minimize impacts to railroad operations, adjacent infrastructure, ROW and the environmental resources, as well as keeping the project on schedule and within the budget. The project is funded by FTA grant under the post-Sandy Emergency Relief Program, and is intended to protect major infrastructure components that are in danger of being damaged during extreme climate events. As such, the replacement bridge is required to have a sufficient **flood resilience** to remain in operation after a major hurricane and the project has to be implemented within a **specified timeframe**. Since the bridge suffered from frequent vessel collisions due to poor channel geometry, it is the intent of NJ TRANSIT to implement feasible **navigational improvements** to the extent possible without delaying the project delivery. The bridge will be replaced off line to **maintain service during construction**. The initial phase of the project includes a feasibility study of the **replacement alternatives** in support of NEPA review, which will be done concurrently under a separate contract. The design team will support the NEPA process by providing necessary engineering studies. Once the NEPA review is completed, the design will proceed to the preliminary and final phases, followed by the construction support. We understand the final design will begin after the NEPA document is approved. To meet the project objectives, our design process will focus on delivering the following key elements:

- Improved flood resilience by raising the profile above 100-year flood level without significant impacts to the approaches
- Movable span options and geometry to ensure reliable operations, longevity and navigational improvements
- Creative engineering and efficient staging to meet the schedule while working within environmental constraints
- Minimal impact on rail operations at the approach interface within the existing alignment
- Safe rail operations by considering equipment clearances, vibration/movement monitoring, and remedial response plan
- Minimal environmental impacts including wetlands, parks and ROW
- Maintained marine traffic during construction
- Expedited permitting/approval process to maintain the project schedule
- Mitigation of adverse effect on historic resources by developing context-sensitive design for coordination with SHPO
- Risk management to prevent schedule delays and budget overruns
- Reduced life cycle costs with corrosion resistant materials with enhanced strength, performance and reduced maintenance

H&H is very familiar with the Raritan River Bridge through direct experience. In the past 35 years, H&H successfully completed a replacement study (with a vertical lift span option) in 1980. We also designed a major rehabilitation and were responsible for various component repairs. Our Team has **thorough knowledge and understanding of the project site**, including the topography, geology and marine conditions, which will be of great assistance during the design process.

6.2 Team's Relevant Experience

The Hardesty & Hanover/Gannett Fleming Joint Venture Team has been formed to meet the challenges of this new bridge design by offering proven project management and expert design services for the replacement of the Raritan River Bridge, a primary component of NJ TRANSIT's infrastructure. The Joint Venture combines the resources and technical expertise of two firms, who are recognized experts in their respective fields: bridge engineering (Hardesty & Hanover) and railroad systems (Gannett Fleming). Both firms have outstanding portfolios of relevant projects and strong relationship with NJ TRANSIT.

HARDESTY & HANOVER (H&H) brings to this Team a 128-year legacy of bridge engineering excellence. As the leading movable bridge expert in the country, H&H has designed more than 100 movable bridges, including the first modern vertical lift bridge and four of the NJ TRANSIT's movable bridges. H&H has unparalleled credentials for this project with an impressive track record







of vertical lift bridge design. H&H's recent railroad movable bridge projects include the *Niantic River Bridge, Port River Bridges, CSX New River Bridge,* and the signature *Sarah Long Bridge*. **H&H movable bridge designs are known for their longevity, reliability and low maintenance.** Our success lies in forward thinking approach, creativity, attention to detail, and application of the world's latest technologies and management techniques. H&H practice is not limited to bridges. In the last two decades, the firm has been increasingly involved in complex transportation projects, focused on infrastructure improvements, including roads and highways. Most recently, H&H was the prime consultant on such projects as the \$640M *Willis Avenue Bridge*, \$350M *Kew Gardens Interchange*, \$380M *Whitestone Expressway*, and the \$225M *Route 1 & 9T over St. Paul's*. These projects are a testimony to the firm's ability to successfully manage and deliver large-scale transportation improvement programs.

GANNETT FLEMING (GF) is the leading firm in rail and transit systems with expertise in **Track, Rail Operations, Signals, Communications, Catenary and Traction Power design**. With tremendous depth of resources in all phases of rail systems as well as civil, structural and environmental engineering, GF is ideally suited to provide the services needed for the Raritan River bridge project. GF has been supplying engineering to NJ TRANSIT in recent years on such projects as the *Gladstone Line's OCS Pole Line Replacement*, support of NJ TRANSIT's *Positive Train Control* and the *Midline Loop* projects, *Portal Bridge Capacity Enhancement* and the *post-Sandy Recovery Programs for Substations*. GF's signal experts were heavily involved in the existing signal systems on the Raritan Bridge and the adjoining interlocking. GF also has extensive experience in the design of transmission line monopoles including NJ TRANSIT's Secaucus Station 138kV run-around monopole line, Amtrak's new monopoles above the Passaic River's Point-No-Point Bridge, and Portal Bridge's six new monopoles. Many of GF professionals were previously employed by railroads and transit authorities, and are unmatched in systems interface, maintenance, and commissioning procedures.

Hardesty & Hanover and Gannett Fleming have successfully worked together on other movable railroad bridge projects including the replacement of Amtrak's *Niantic River Bridge*, Metro-North's *Peck Bridge*, and the *Port of Miami FEC Railroad Bridge*. The success of those projects is a testimony to our ability to form a seamless, integrated team combining the best technical and management resources to meet the project challenges and provide the best value to the client. The most recent example of our collaboration is the feasibility study for the replacement of NJ TRANSIT's *Brielle Bridge*.

6.3 Qualifications of Key Project Staff

We carefully selected our Key Project Staff to offer a team that integrates recognized technical experts and experienced managers with proven track record of succesfully delivered complex multidiscipline projects and strong relationship with NJ TRANSIT. Our **Project Manager Visha Szumanski**, PE (H&H), managed large scale transportation projects such as \$450M *RFK Bridge Rehabilitation* and led the design of the *Second Avenue Subway* and *Penn Station Redevelopment*. She is well familiar with NJ TRANSIT requirements, having managed a Task Order Contract, which included rehabilitation of the *Morgan Draw Bridge* in South Amboy. Ms. Szumanski will be assisted by two **Project Engineers: Richard Cross**, PE (GF), who delivered the design for the *Portal Bridge* and **David Tuckman**, PE (H&H) who had management roles on many of H&H's significant movable bridge projects, including the signature *Woodraw Wilson Bridge*. The Joint Venture **Principals-in-Charge, Paul Skelton**, PE (H&H) and **David Boaté**, PE (GF), who will provide a high-level oversight to make sure that the projects meets all NJ TRANSIT objectives, are not only senior executives in the JV firms, but also accomplished industry experts. Mr. Skelton, the former Chairman of AREMA Committee 15, personally managed the design of many H&H's recent movable bridges. Mr. Boaté is a rail systems expert, who is well known to NJ TRANSIT for his role on projects such as the *Midline Loop* and the post-Sandy *Substations Repairs/Hardening*.

Our **TECHNICAL TEAM** includes **Peter Roody**, PE (H&H), **Discipline Lead – Movable Bridge Design**, who is a movable bridge expert known for his innovative engineering solutions. **Structural Design** will be led by **Michael Hawkins**, PE (H&H), who delivered the design for *Sarah Long Vertical Lift Bridge*, **Paul Connolly**, PE (H&H), who managed the feasibility study for *Brielle Bridge* and **David Gerber**, PE (H&H) who had a leading role in the rehabilitation of *Newark Draw Bridge*. **Mechanical Engineering** will be led by **Steve Mikucki**, PE (H&H), who is the Chairman of Heavy Movable Structures and AREMA Movable Bridge and **Permitting** will be led by **David Howell**, PE (GF), who was the Deputy PM for the *Portal Bridge* and **Permitting** will be coordinated by **Glen Schetelich**, PE (H&H) who managed dozens of major bridge projects in the New Jersey Coastal areas.

We recognize that collaborative decision-making and teamwork are critical to this project's success. To fulfill this obligation, we offer our **A-TEAM** of engineers, managers and industry professionals with superb credentials and proven track records. Our Key Project Staff have extensive rail/transit experience, constructability expertise and hands-on knowledge of the regulatory requirements. Our Team has worked together as a **seamless team** on other RR bridge replacement projects.





6.4 Management Approach

A successful project management approach is based on three critical principles: 1) develop an efficient work plan for the project, which outlines all activities that must take place to meet the specified milestones; 2) be proactive, i.e. identify key issues, anticipate potential problems and develop strategies to make sure they do not impact the project schedule and budget; 3) maintain good communication internally, with the client, third parties and approving agencies, to keep everyone well informed and facilitate decision making processes. Our management philosophy stresses the need for a well-developed organizational structure capable of adapting to specific needs, and efficient planning of all design activities necessary to achieve the project goals on schedule and within the budget. The key components of our management strategy are summarized below.



PMP is the foundation of our management approach. The PMP will translate the overall project objectives into a detailed road map of concrete deliverables. It will describe the project organization, the relationships and responsibilities of the team members, the communication protocol and the procedures that need to be followed during all project phases, including quality assurance, safety requirements, schedule, budget, document control procedures, and the project milestones/deliverables. The objective of PMP will be to clearly define project requirements and provide sufficient guidance to the team members to ensure that the work can proceed as planned. In addition, we will develop a detailed WORK PLAN which is outlined in SECTON 8 and reflected in the resource allocation table.

> **Risk** Management

Infrastructure projects face a variety of risks with the potential to impact the project schedule or even the overall outcome. Therefore, identifying risks and developing mitigation plans is an essential component of the project management strategy. The major risks on this project are related to the permitting/approvals process and construction staging to meet the project schedule. In particular, construction of the bridge foundations will be on a critical path, considering the complex site conditions. Proximity of active rail operations will be another area of major concern during construction. Our approach to mitigating these risks is to form task forces that will focus on a particular problem areas. For instance, our foundation team consists of geotechnical and constructability experts with first-hand knowledge of the construction issues at the project site. The risk management process will involve developing a risk register and mitigation strategies. Major risks will be monitored and re-evaluated after mitigation. Maintaining a close dialog with NJ TRANSIT will be essential during this process. See our initial risk register on the following page.

Quality Management

Quality of the design will be ensured through a combination of management controls and a comprehensive set of reviews/checks at various stages of the project. Central to this process will be the participation of the Project Manager, who is responsible for developing/implementing a Quality Management Plan. Control of the design activities will be defined in the Design Control Plan, which will include procedures for internal verification of design documents, prior to submission to NJ TRANSIT. The requirements for issuing revisions or making other changes to the contract documents will be defined in the Configuration Management Plan. We approach quality management as a continuing process that begins with NTP and proceeds through design and construction. This process is applied to all project activities, including non-engineering tasks, and the work of subconsultants.

The schedule will be achieved by continual monitoring, updating, and enforcing deadlines. Schedules will be updated on a monthly basis or as required. The status of individual tasks will be determined, along with forecasts of work to be completed in the next period. Drawings and specifications will be evaluated as they advance to ensure they are in sync with the schedule assumptions. Our approach is to avoid surprises by anticipating problems and devise ways to address them. We understand most "schedule busters" result from unanticipated events, such as delayed permitting or lack of third party concurrence. Many of these issues can be avoided with proper planning and good understanding of the regulatory requirements. Timely completion of the Preliminary Phase is crucial to maintaining the project schedule, because it involves many third party participants. Understanding of their requirements and providing timely and adequate information will facilitate expedient resolution of issues.



Schedule

Control

Our Team will employ web-based document management system to provide a central clearinghouse for project documents and to store and manage correspondence, reference materials, guidelines, and project deliverables. There are several non-propriety systems available, which have user friendly interface, require minimal training and guarantee full security, such as Project Solve collaboration software, which was designed specifically for the engineering and construction industries, and is an efficient documents control tool allowing the project team to manage, share and distribute engineering project content and review in a single platform. Selection of the most suitable document management system will be done in consultation with NJ TRANSIT to assure efficient collaboration and true information mobility for all project participants.

> Subconsultant Management

Each of our subconsultants will have a well-defined role on the project, consistent with their fields of expertise, to execute distinct elements of work and be responsible for discrete portions of deliverables. Management of subconsultants will be accomplished using the same principles that guide effective management of the in-house staff: 1) quantified definition of the scope, schedule, budget; 2) clear, timely and focused direction; 3) defined interface requirements; 4) explicit instructions concerning format, content and level of detail required in the deliverables; 5) timely measurement & reporting of work progress; 6) good communication. We recognize managing the subconsultants' performance needs to be as structured as other aspects of the project management to ensure their performance enhances the overall project outcome and meets the client's expectations. Monitoring the subconsultant's progress and quality of performance are the most important components of this process.

Budget Control will be based on a detailed work breakdown structure capturing all project tasks and activities that will produce the required deliverables. These tasks will be reflected on the project schedule with anticipated completion dates and assigned budgets. Expenditures will be planned to create a budget plan. Actual expenditures will be tracked monthly and compared with the plan. In addition, earned value will be calculated based on the actual work completed in each period. Budget plan, earned value and the actual expenditures will be compared periodically to monitor the work progress and budget status. Any deviation from the budget plan and schedule will be addressed immediately, and corrective actions will be implemented to assure that original contract requirements are maintained. Our approach to scope changes is to inform NJ TRANSIT of any unanticipated work before it occurs, and then follow-up and work together for a resolution.

Monitoring of the work progress is essential to keep the project on schedule and within the budget. Without proper monitoring, problems can go undetected like leaking of underground pipe. The monitoring will be done by regular updating of the project schedule and using metrics to evaluate the work progress such as planned vs. actual % complete and labor utilization reports. Progress will be reported to NJ TRANSIT in monthly Progress Reports, which will include progress schedule and curves/histograms. The reports will also outline problems/issues that need resolution and include a list of "action items", identifying the responsible party and the timeframe for response. Project Progress Meetings, scheduled on monthly or as needed basis, will provide additional means of monitoring the work progress. In addition to reviewing the project status, the meetings will focus on outstanding issues/decisions.

Maintaining good communication with the client, third parties and internally, is one of the most important aspects of project management strategy. Frequent communication with the key project participants and stakeholders will allow us to identify potential issues, make everyone aware of them and facilitate necessary decisions to keep the project on schedule. For instance, if during the course of the project we discover an unanticipated change in the design is required, it is imperative to bring this issue to everyone's attention immediately, before the impacted activities advance too far. **Our approach is to be proactive**. Our key management and technical staff have the knowledge and experience to recognize the challenges posed by the design decisions and communicate them to NJ TRANSIT for consideration.

Budget Control

Progress Monitoring

Communications





Risk Register

PROJECT: DATE: REVISION:

Raritan River Bridge July 16, 2015 Draft

			Risk II	npact		Risk Response Planning	
Risk Statement	Initiai Risk Owner	Risk Level	Sched	Cost	Response Strategy	Risk Response Action Plan	Final Risk Owner
PROJECT MANAGEMENT	RISKS						
Design Changes	Design Team/ NJT	3 Moderate		x	Mitigate	Accurate surveys; clarifying requirements; agency coordination; peer and constructability reviews; design meetings; NJ TRANSIT reviews	Design Team
Missing Scope	Design Team	1 Very Low		x	Avoid	Clarify requirements; interdisciplinary coordination; peer and constructability reviews	Design Team
Construction Cost Higher Than Available Budget	Design Team/ NJT	4 High	x	x	Mitigate	Design to budget; technical & constructability expertise; innovation/creativity; value engineering; "tried & true" construction	Design Team
Unreasonable Schedule Expectations	Design Team/ NJT	3 Moderate	x		Mitigate	Construction staging expertise	Design Team
Availability of Materials & Equipment	Design Team / NJT	2 Low	x	x	Mitigate	Specifications that are not too restrictive; design that allows variety of means and methods	Design Team
PERMITS & APPROVALS							
Environmental/Ecological Restrictions	Design Team / NJT	2 Low	x		Accept	Good understanding of regulatory requirements; experience in permitting; experience in constr. staging	Design Team
Coast Guard Restrictions	Design Team/ NJT	2 Low	x	x	Mitigate	Construction staging to minimize impact on navigation; experience in USCG coordination; communicate often with the USCG	Design Team
EXISTING UTILITIES							
Unanticipated Utility Conflicts	Design Team / NJT	2 Low	x	x	Avoid	Good survey; utility coordination; peer & constructability reviews	Design Team
COMMUNITY RELATIONS	}						
External Stakeholder Demands Changes Late in Project	NEPA Team / NJT	1 Very Low	x	x	Accept	Comprehensive public outreach and agency coordination	NEPA Team
MOVABLE SPAN							
Unsatisfactory Operational Tests	Contractor / NJT	2 Low	х		Avoid	Comprehensive specifications; factory testing; contractor's quality assurance; redundancy	Contractor
FOUNDATIONS							
Difficulty with Pier/Pile Installation	Contractor / NJT	4 High	х		Mitigate	Geotech design expertise; first-hand knowledge of site geology and constructability issues	Contractor
Impact on Existing Structure	Contractor / NJT	3 Moderate	x		Mitigate	Structure monitoring and efficient emergency response plan; proactive repair design	Contractor
RAIL OPERATIONS							
Unplanned Service Shutdown Due to Staging Issues	NJT	2 Low	x	x	Mitigate	Constructability expertise; proven staging plans; comprehensive bid documents	NJT
CONSTRUCTION							
Seasonal Restrictions on Construction	Contractor / NJT	3 Moderate	х		Mitigate	Foundation solutions to overcome restrictions; construction staging expertise	Contractor
Difficult Access or Limited Work Area	Contractor	2 Low	x		Avoid	Developing construction staging methods best suited for the site conditions; ROW access	Contractor
Environmental Impacts (Vibrations, Noise)	Contractor	2 Low	x		Mitigate	Good understanding of regulatory requirements; vibrations/noise monitoring programs	Contractor







6.5 Technical Approach

In preparation of this proposal our Team has done extensive studies of various design components and developed many solutions based on our extensive movable bridge and construction staging expertise. Key issues that will be driving the design process in order to meet the demanding project schedule, including **creativity/innovations in foundation and movable span design**, **approach span options** and **construction staging** are presented below.

6.5.1 FOUNDATION DESIGN & INNOVATIONS

The subsurface profile consists of fill, underlain by layers of compressible cohesive deposits and glacial till on top of very hard diabase bedrock with a steep sloping profile. These challenging conditions can be best addressed by using large and medium-sized drilled shafts or steel pipe piles to support the new piers. Considering the environmental restrictions and the proximity of the existing bridge, which will be maintained in operation during construction, **drilled shafts** have clear advantages, particularly for the lift span piers, including: **1**) **less noise and vibrations during installation**, which reduces environment impacts and risk to RR operations; **2**) work within the drilled shaft casing can be done during fish moratoriums, which allows more flexibility in construction staging. In addition, the use of drilled shafts offers the opportunity for an INNOVATIVE FOUNDATION APPROACH, including:

- DRILLED SHAFTS WITH POST-GROUTED TIPS Typically, the length of the rock socket is determined by relying on side resistance only, without considering end bearing, to account for loose sediment at the tip. This often results in very long rock sockets, increasing the construction cost and duration. H&H has addressed this issue by using drilled shafts with post-grouted tips that engage both side and tip resistance of bedrock.
- USING DILLED SHAFTS WITH HIGH PERFORMANCE CONCRETE allows to achieve greater capacity with high density reinforcement, thus reducing the required shaft diameter. This approach was successfully used on <u>NJTA Mullica River Bridge</u>.
- OPEN END STEEL PIPE PILES (7' to 4' diameter) driven to glacial till or bedrock with controlled energy to minimize vibrations while continuously monitoring the existing structure. H&H successfully used this technique on NJDOT <u>Route 52 Causeway</u> and NJTA <u>Great Egg Harbor Bridge</u> where the new piles were installed 11 ft. from the existing bridge.
- SINGLE SHAFT PIERS Our initial analysis indicate that it may be feasible to support approach spans on single, large diameter drilled shafts, which would expedite the construction. However, single shafts are non-redundant, which poses separate challenges that would have to be addressed.

6.5.2 MOVABLE SPAN ALTERNATIVES & INNOVATIONS

The movable span replacement alternatives include **vertical lift**, **bascule** and **swing** spans. A bascule option would require two, opposing double-leaf spans with a center pier, since a single 300 ft. span is not practical for achieving the project goals. Therefore, neither of the swing nor bascule options provide significant navigational improvements. Additional disadvantages include construction impact on navigation, since the new center pier would have to be built in one of the existing channels. Although all feasible replacement alternatives will be evaluated during the NEPA process, it is clear that the vertical lift span will likely be the preferred alternative. The design will focus on creative/innovative approach to expedite the construction, reduce maintenance, and increase flood resilience and durability. Some **INNOVATIVE SOLUTIONS** that may be considered are outlined below.

- FENDER SYSTEM One option is to design the lift span piers to resist impact from recreational vessels and eliminate fenders along the sides, to maximize the width of navigational channel. Protection from larger impacts would be provided by cellular structures at each end of the pier. Another option is to eliminate all fenders and design the piers for full vessel impacts. This would not only generate savings, but also eliminate the need to remobilize foundation equipment for the south fenders after the existing structure is demolished. H&H used this approach on <u>Sarah Long Vertical Lift Bridge</u> in Maine, currently in construction.
- MACHINERY Pre-testing the machinery and electrical system for the span drive in the fabrication shop under full load, to confirm capacity, alignment and proper control wiring, will save time in the field and remove this task from the critical path. Other potential machinery innovations include installing span lock machinery at the lift span top chord, which is well above the 100-year flood elevation. In addition, H&H designs movable rail bridges to have an imposed load at the seats as is now outlined in AREMA Article 6.5.35.3 for bascule spans. Given our leadership in Committee 15, we expect this requirement will soon be applied to vertical lift bridges under Article 6.5.36.2 providing stable secure rail joints under live load, regardless of balance condition or vibratory effects.





- POWER/COMMUNICATIONS On the movable span, the communications and power are typically maintained with the use of a submarine cable. We will investigate utilizing the auxiliary counterweight system to facilitate power and communication conduit between towers, thus eliminating the submarine cables. This would generate cost savings, facilitate maintenance (buried subcables can get damaged during dredging and cannot be visually inspected) and reduce environmental impacts.
- MATERIALS/FINISHES We will evaluate the feasibility of using High Performance Steel (70 and 100 ksi) to achieve longer span without increasing self-weight, thus allowing more efficient lift span design. We will weigh the benefits of HPS against the drawbacks of using less available and more costly material, which could limit the number of fabricators and possibly impact the schedule. We will also consider galvanizing or metalizing to improve durability and reduce maintenance. We used metalized steel in the design the *Portal*, <u>CSX New River</u>, <u>Flagler Memorial</u> and <u>Route 7 Passaic River Vertical Lift</u> Bridges.

6.5.3 APPROACH SPAN ALTERNATIVES

This bridge has 2,800 LF of approach structure. Therefore, construction of the approach spans will be on a critical path. Tight schedule and environmental restrictions add another level of difficulty to construction staging. The main design focus will be on developing engineering solutions to expedite construction, such as reducing the number of piers or using a modular structure. We have done initial study of different superstructure types versus span length and determined the most feasible options, which include:

- Steel Multi-Girders (90'–100')
- Steel Through Girders (100'–135')
- Through Truss (200' or longer span)

All of these options have pros and cons. For instance, the multi-girder solution has the lowest cost, but may not offer the optimum pier spacing to minimize potential foundation risks. The truss option has 50% less piers, which expedites foundation work (a critical path item), but it requires longer fabrication time and increases future maintenance. Balancing span

CRITERIA	APPROACH SPAN ALTERNATIVES							
	STEEL MULTI-GIRDER 90' – 100'	THROUGH GIRDER 135'	THROUGH TRUSS 200'					
NO. OF PIERS	Same as existing	25% less piers	50% less piers					
COST (INCLUDING FDNS)	Lowest cost	Less than truss but more than multi-girder	Highest cost					
MAINTENANCE	Redundant, easy to repair/replace	Non-redundant; major repairs difficult	Non-redundant; difficult repairs; surface protection					
CONSTRUCTABILITY	Light, easily installed	Too heavy to pre-assemble	Can be pre-assembled					
FLOOD RESILIENCY (100-YEAR FLOOD)	Bottom of steel 1 - 2 feet below flood elevation	Bottom of steel above flood elevation	Bottom of steel above flood elevation					
SHPO	Same as existing	Similar to existing	Different visual effect					

lengths, pier placement, permitting requirements, maintenance issues and other considerations will allow us to develop the best solutions for a resilient structure, while expediting the construction and assuring the performance desired for the future. Some of the criteria for comparison have been summarized in the table above. For bridge deck type, ballasted and unballasted deck options will be investigated. The steel pan ballasted deck appears to be the likely option that will meet the project needs. Each bridge type alternative will be qualified and quantified to provide adequate basis for selecting the solution that best meets all project objectives.

6.5.4 CONSTRUCTABILITY & CONSTRUCTION STAGING

As stated earlier, one of the project goals is to **minimize the impact** of bridge replacement on the adjacent properties and environment. This is of paramount importance in order to avoid a lengthy environmental approval process, which could end with EIS and delay the project delivery. We recognize the project site imposes significant **constraints on construction staging**. The alignment on the east approach (Perth Amboy) is surrounded on the south by Green Acres **parkland**, including the existing Sadowski Waterfront Park and the future Second Street Park, which will have a boat ramp next to the bridge. The **steel plant** on the north is located on an **archeological** site, with RR sidings for deliveries connecting to the main alignment. The proximity of these properties to the existing alignment makes it virtually impossible to locate a staging/laydown on the east approach. On the west approach (South Amboy), the north side has **wetlands** and therefore only the south side offers potential staging opportunities.

These constraints impose serious **limitations on the feasible alignment** options and construction methodology. Considering the aggressive construction schedule (36 months) and environmental restrictions on construction in the water (**fish windows**), the staging of construction will a major focus area during the design process to ensure that the engineering solutions for the bridge foundations, superstructure and movable span can be implemented within the specified timeframe, without causing additional environmental impacts.

ALIGNMENT	ALTERNATIVES
RR SOUTH ALIGNMENT	RR NORTH ALIGNMENT
PROS: • Better construction access • Staging area on west approach	PROS: • 60 mph speed • No impact on parkland • No conflict with old foundations • Better staging of track tie-ins
CONS: • 50 mph max speed • Parkland property taking • Conflict with old foundations • Difficult staging of track tie-ins	CONS: • Impact on wetlands • No access from land • No adjacent staging areas







ACCELERATED BRIDGE CONSTRUCTION

The three main components of the project, the approach spans, movable span, and the alignment on the approach embankments will be constructed simultaneously to meet the 36 months schedule. The schedule will be driven primarily by the erection of the approach structures, which are more than half a mile long and subject to environmental restrictions (fish windows). Therefore, our Team will study various options for accelerating bridge construction, including the following:

- PRECAST CONCRETE PIER CAPS Use of precast concrete components, which are fabricated off-site, allows bridges to be constructed more rapidly and reduces environmental impacts. Recently used by H&H on <u>Saugus River Railroad Bridge</u> near Boston. Challenges: The caps are very heavy, require large cranes for installation.
- PRECAST CONCRETE BOX FORMS FOR PIER CONSTRUCTION H&H is using this approach on <u>Sarah Long Lift Bridge</u>. The forms can be placed with standard size cranes to facilitate concrete placements, without cofferdams, thus significantly expediting the foundation work and generating savings. **Challenges:** Pour closures of the box/shaft interface can be problematic if the contractor does not utilize proven details. H&H used vetted details on several past projects.
- PREASSEMBLED STEEL SUPERSTRUCTURE COMPONENTS Used by H&H on many movable bridge replacement projects. The movable span is assembled off site and floated in. The erection takes only a couple of days. This technique can also be used for the approach spans, which would be preassembled off site and floated in on barges. Challenges: Shallow water on approaches poses limitations on this method. Use of barges is not feasible where the water depth is less than five ft.
- LAUNCHING OF MODULAR OR PREASSEMBLED STRUCTURE H&H is currently using this approach on <u>MNR Fulton</u> <u>Ave Bridge</u> in Mt. Vernon, NY, which involves launching a 160-ft.-long truss over four-track New Haven line, the busiest commuter rail route in the country. Challenges: Tight ROW and environmental constraints on the approaches make it difficult to find an adequate launching area, especially for the north alignment.

	CONSTRUCTION METHODS	
CONVENTIONAL (CRANES)	PRE-ASSEMBLED (FLOAT IN)	LAUNCHING
PROS & CONS • Doesn't need staging areas on approaches • Very efficient for light, modular structures • Can be used in shallow water (with trestles) • Time consuming for complex structures	PROS & CONS • Pre-assembled off site, no need for staging area • No heavy equipment • Rapid erection (slide-in/roll-in) • Cannot be used in shallow water	PROS & CONS • Pre-assembled segments off-site • No heavy equipment • Rapid erection • Requires launching area on approach
APPLICATION Approach spans Most suitable for deck girder alternative	APPPLICATION Movable span; approach spans in deep water Most suitable for through girder alternative 	APPLICATION Approach spans Most suitable for truss alternative

EXISTING STRUCTURE MONITORING & MITIGATION

We recognize that heavy construction activities in close proximity to the existing railroad structure pose a significant **risk to operations**. Installing new foundations can cause soil disturbance leading to undesirable movements of the existing structure. Therefore, it is imperative to implement a **monitoring system** and develop a **response plan** that can be **rapidly implemented** if the registered movements are outside of the safe range. H&H has extensive experience in bridge structure monitoring and mitigation. Recent railroad bridge examples include reconstruction of the <u>Saugus River Drawbridge</u> in Boston for MBTA and replacement of the <u>9th Street Lift Bridge</u> in New York, which was constructed directly under a NYCT bridge over the Gowanus Canal. H&H also monitored NJ TRANSIT's <u>Shark River Drawbridge</u> during construction of the Route 35 Bridge.

The monitoring involves placing accelerometers, inclinometers and position indicators at the top of each pier to measure vibrations, tilt and rotation. The system deploys a notification to the contractor and designated design team members, if the acceptable movement envelope is exceeded. Upon receiving such notification, an inspection crew is dispatched expeditiously to evaluate the condition and take additional field measurements. If the problem cannot be mitigated by rail adjustment, the contractor will install a simple **jacking system**, consisting of a jacking beam and hydraulic jacks to make the necessary adjustments. The jacking beam can be installed using small construction equipment, by either bolting or welding to the girder bearing stiffeners. The whole operation can be done quickly without significant impact on service. The monitoring requirements and **mitigation measures** will be specified in the contract documents to ensure that the contractor is prepared to react quickly.





MOVABLE SPAN CONSTRUCTION

To minimize the impact on navigation and operations of the existing bridge, which will be in service during construction, the most likely method of installing the new lift span will be to **assemble the truss off site and float it in**. The surrounding area has numerous potential staging sites upstream, which gives another advantage to the north alignment option. Using this approach, the contractor has several options to assemble the truss:

- Assemble directly on the barges with a floating crane.
- Assemble near the shoreline on temporary piles and slide the barges under the truss.
- Assemble on the shore and launch the truss onto the barges on temporary pile supported "runways or finger piers".

This last method seems most efficient, especially, if the staging area could be located on the property of Raritan Steel, immediately north of the bridge, which has over 400 feet of shoreline. After the lift span is assembled, the counterweight ropes will be installed and aligned so there are no twists in the wire, then attached to a temporary spacer at the side to hold them in place, and out of harm's way during the float–in. Below is a **step-by-step construction staging** and the anticipated durations of major operations.

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•	Float in lift span truss on two barges (to accommodate the existing center pier) at high tide	6 hou
•	Lower the lift span onto the bridge seats using a jacking system (without waiting for the tide change)	6 hou
•	Connect sockets to the take-ups via the socket pin connections - two crews	8 hou
•	Remove the counterweight hanger pins, utilizing the jacking frame. This will transfer the load of span and counterweight to the ropes, and load the counterweight sheaves and trunnion bearings	8 hou

The major staging operations, which will require a full closure of the navigational traffic, can be completed in **less than 36 hours**, since some of the tasks can be done concurrently. There will be **no impact to rail operations**. With the anticipated span drive system, the structure can be rapidly lifted and locked in a raised position on the lift towers to allow final testing of the machinery without impeding the existing bridge operations.

APPROACH SPAN CONSTRUCTION

Our initial assessment of launching or floating in preassembled approach spans, indicates that these methods would be difficult to implement, considering the site constraints. A **conventional approach**, using cranes, seems to be better suited for this project. This method does not require any staging/laydown area on the approaches and can be very efficient for light superstructures, such as the multi-girder system.

The riverbed profile has very **shallow waterways** on the approaches, with depths as shallow as 5 ft. towards the east and west shorelines. To accommodate the necessary construction equipment, a **temporary trestle** would be required at both approaches where water levels are too shallow for barge construction. **Floating barges** would be utilized elsewhere, as permitted by the water depth. Temporary trestles are typically limited to cranes in the **200TN to 250TN** range to remain economical. Crane of this size would be able to **set pairs of girders during each pick**. Crane reach would not be critical, as the trestle would have "fingers" required for the construction of foundations. Trestle construction would commence from the water due to ROW constraints. Materials would have to be delivered in large quantities, to **minimize existing bridge openings**, and stored on barges or nearby land areas, as feasible. To expedite construction in the deep water, the contractor could **preassemble the entire span on barges**, float in and erect using **350TN** rig (approximately 118k pick).



Components	Resources	Design Tasks / Work Components	Construction Staging / Major Operations	Construction Duration
Approach Work	 GF Design Lead Geotechnical Team B Civil Team Track Team Rail Systems Team Construction Staging Team 	 Ground improvement Relocation of utilities/facilities Site grading, drainage Embankments, retaining walls Track/alignment Rail systems Staging of track tie-in 	 Mobilization Ground improvement, grading Construct retaining wall/embankments Phase track tie-in Tie in signalization and power 	 24 Months Approach work (concurrent with bridge construction) 5 Months Staged construction of track, signalization and power
Bridge Approach	 H&H Design Lead Geotechnical Team A Bridge Structure Team A Track Team Rail Systems Team Construction Staging Team 	 Geotech report/ recommendations Approach span foundations Abutments and piers Approach span structure Track and drainage system Power, rail systems Construction staging 	 Install east and west trestle Shaft testing on east/west approaches Install east and west shafts Install east and west piers & abuts Erect east/west steel superstructure Erect east/west bridge deck or ballast pan Install east/west high tension/catenary poles Remove east and west trestles 	 24 Months No vibratory equipment during fish windows; working within drilled shafts is acceptable
Lift Span	 H&H Design Lead Bridge Structure Team B Mechanical/Electrical Team Track Team Rail Systems Team Construction Staging Team 	 Movable span structure Mechanical/elect systems Architectural support Control house/signals shed Track and drainage system Rail systems Construction staging 	 Procure lift span truss steel Set up truss assembly area Assemble truss Install span operating machinery Launch truss to barge and float in Set truss on bridge piers Lift span testing 	 24 Months (concurrent with approach span work) No environmental restrictions
Lift Tower	 H&H Design Lead Bridge Structure Team B Geotechnical Team A Mechanical/Electrical Team 	 Lift tower foundations Lift tower piers Fender system Lift tower structure Mechanical/elect systems Architectural support 	 Shaft testing for lift tower piers Install lift tower shafts and piers Erect lift bridge towers Install counterweight and sheave machinery 	 15 Months (concurrent with approach span work) Shaft installation within fish windows

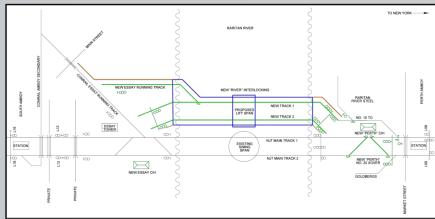


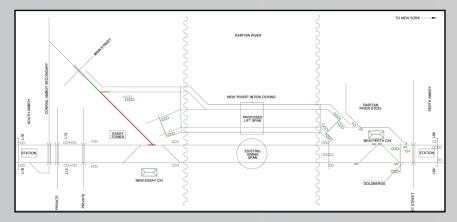


NOTE: Demolition = 7 Months Total duration of Construction = 36 Months

TRACK CONSTRUCTION STAGING ON APPROACHES

Our design team has carefully evaluated the construction staging issues from a rail operations perspective and developed a conceptual staging plan for the north bridge alternative. The stages afford minimal impact to both NJ TRANSIT and Conrail operations through weekend cutovers of freight and mainline tracks including needed OCS and signal work. During the one-week duration of Stage 4, NJ TRANSIT would have single-track operations on Track 2 between ESSAY and RARE interlockings. An operational analysis will be completed to determine if a temporary crossover would be required to mitigate adverse operational impacts.





STAGE 1 Duration: 24 Months SEQUENCE OF WORK:

- SEQUENCE OF WORK:
- Construct new bridge complete offline
 Construct new embankment and retaining walls to clearance points
- 3. Construct new tracks to clearance points
- 4. Construct new Perth interlocking on east shore
- 5. Connect new main track 1 to existing Raritan steel sidetrack with a temporary turnout on east end

NOTES:

- 1. At end of stage 1, all existing tracks are in service
- 2. New lift span in-service and interlocked with existing swing span.
- 3. Both existing Essay and New Perth Interlockings are in service.

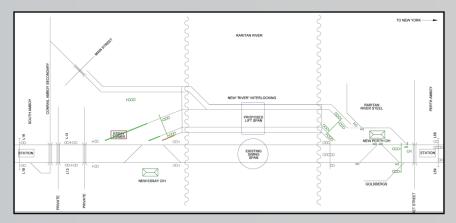
STAGE 2 Duration: 2 Weeks

SEQUENCE OF WORK:

- 1. Cut and throw Conrail to new alignment
- 2. Remove Conrail turnout in existing Essay
- 3. Remove old Essay running track

NOTES:

1. At end of stage 2, all existing NJT tracks are in service 2. Conrail in service over Raritan steel siding and new bridge



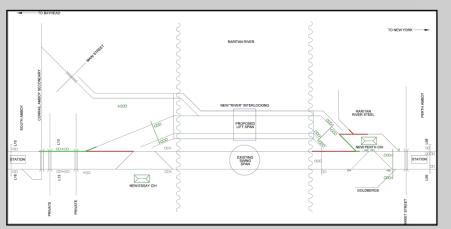
STAGE 3 Duration: 8 Weeks

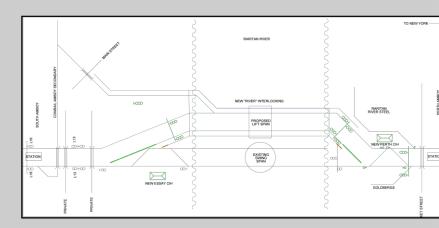
SEQUENCE OF WORK:

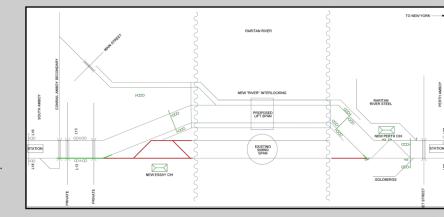
- 1. Demolish Essay tower
- 2. Extend new main tracks to clearance points on west end 3. Extend retaining wall on west end
- . Exteriu retairiiriy wali on we

NOTES:

At end of stage 3, all existing NJT tracks are in service
 Conrail in service over Raritan steel siding and new bridge.







LEGEND EXISTING EXISTING NEW TRACK THIS STAGE

- TEMP TRACK THIS STAGE
- NEW RET. WALL THIS STAGE
 - REMOVE THIS STAGE
- NEW TRACK PREVIOUS STAGE
 - TEMP TRACK PREVIOUS STAGE
- NEW STRUCTURE PREVIOUS STAGE
- NEW RET. WALL PREVIOUS STAGE



STAGE 4 Duration: 1 Week

SEQUENCE OF WORK:

- 1. Cut and throw main track 1 to new alignment on west end
- 2. Cut and throw main track 1 to new alignment on east end
- 3. Remove temporary track connection to Raritan River Steel and restore sidetrack
- 4. Remove old track 1 on both sides of bridge

NOTES:

- 1. At end of stage 4, no. 2 Track is in service over existing bridge.
- 2. No. 1 Track in service over new bridge.
- 3. During construction, single main track 2 in service between new Essay and Rare
- 4. Conrail in service over new bridge.

STAGE 5 Duration: 8 Weeks

SEQUENCE OF WORK:

- 1. Extend new main track 2 to clearance point on west end
- 2. Extend new main track 2 to clearance point on east end
- 3. Extend retaining wall on both ends as required

NOTES:

- 1. At end of stage 5, No. 2 Track is in service over existing bridge.
- 2. No. 1 Track in service over new bridge.
- 3. Conrail in service over new bridge.

STAGE 6 Duration: 1 Week

SEQUENCE OF WORK:

- 1. Cut and throw main track 2 to new alignment on west end
- 2. Cut and throw main track 2 to new alignment on east end
- 3. Remove existing essay crossovers
- 4. Remove old track 2 on both sides of bridge

NOTES:

- 1. At end of stage 6, all tracks are in service over new bridge.
- 2. During construction, single main track 1 is in service between new Perth and Rare

STAGE 7 Duration: 7 Months

SEQUENCE OF WORK:

- 1. Demolish old swing span and center pier
- 2. Demolish old approach spans







CONSTRUCTABILITY/STAGING HIGHLIGHTS

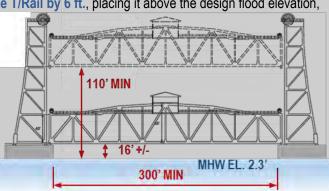
- To minimize ROW impacts, staging/laydown areas will be off-site or the materials will be stored on barges. We have identified several potential staging areas upstream in close proximity to the project site. Materials will be delivered in large quantities to minimize bridge openings.
- Difficult subsurface conditions (very hard rock with a steep sloping profile) can be best addressed by utilizing large diameter drilled shafts with grouted tips to reduce the rock socket lengths. Using HP concrete will minimize the shaft diameter. Other options include open-end steel pipe piles driven with controlled energy to minimize vibrations. H&H recently used this technique on NJTA's <u>Great Egg Harbor Bridge</u>, where the piles were driven 11 ft. from the existing structure.
- Construction of foundations are on the critical path due to environmental restrictions. Using drilled shafts would alleviate this challenge, since work can be done within the drilled shaft casing during fish windows (the casings serve as cofferdams).
- Monitoring of the existing bridge during foundation construction is of critical importance to assure safety of railroad operations. H&H has extensive experience in railroad structure monitoring and rapid response planning. Recent examples include NJ TRANSIT's <u>Shark River Drawbridge</u>, NYCT's <u>"F" Line over Gowanus Canal</u> and the MBTA's <u>Saugus River Bridge</u>.
- H&H's unmatched movable bridge expertise allows us to implement design innovations and improved detailing that deliver operational reliability of and longevity to the movable span. Many of H&H's vertical lift bridges designed 100 years ago are still in operation. We can also eliminate submarine cables providing ease of maintenance and reducing environmental impacts.

- Efficient coordination with Conrail is very important to facilitate the track construction staging. Some of our Key Project Staff, including Deputy Project Manager, Rich Cross and Track Discipline Lead, John Legath, are former Conrail employees with extensive understanding of the railroad's requirements and procedures, as well as close relationship with the Conrail's staff.

NAVIGATIONAL IMPROVEMENTS & FLOOD RESILIENCE

Our Team has developed a new alignment that enables us to raise the T/Rail by 6 ft., placing it above the design flood elevation,

without impact on the existing bridges on the south approach. This protects the railroad tracks and structures from flood damage and doubles the vertical clearance in a closed position (currently 8 ft.), thus reducing the number of bridge openings. We have also developed a construction staging approach that allows erection of the lift span piers with minimal impact on navigation and widens the existing channel to more than 300 ft. The vertical clearance is governed by the conditions upstream, but it is likely to be at least 110 ft. (matching the upstream Route 35 Victory Bridge).



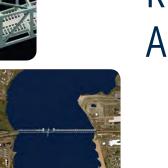


Request For Proposal (RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the **DADITANI DIM**

RARITAN RIVER DRAWBRIDGE









SECTION 7 Team Organization/ Resource Allocation





SECTION 7: TEAM ORGANIZATION & RESOURCE ALLOCATION

Developing a proper organization chart is a critical step in the process of setting up the project. The organization chart communicates the Team's understanding of the contract requirements and the processes that have to take place to achieve the project goals. It defines the organizational structure and lays the foundations for efficient work plan necessary to successfully deliver the project. Our **Team Organization Chart** below defines the responsibilities of each firm on the team. The **Project Organization & Staffing Chart** illustrates our Team's clear lines of authority and communication between the Project Management Team, Task Managers and all Key Disciplines required to deliver this project, including identifying each Discipline Leader.

PROJECT PRINCIPALS, **Paul Skelton**, PE (H&H) and **David Boaté**, PE (GF), will provide a high level oversight and make sure that **adequate resources** have been allocated to the project, the **work proceeds as planned**, and there are **no quality issues** or **problems with approvals**, so the project can be delivered on time to a full client satisfaction.

PROJECT MANAGER, Visha Szumanski, PE (H&H), will be responsible for the overall contract performance and will be the primary point of contact with the client. Ms. Szumanski, a veteran manager of large multi-disciplinary contracts, will be responsible for managing all contract activities, tracking and reporting the work progress and ensuring that the project team meets the professional quality standards. She will provide personal leadership to the project team and will assure schedule and budget compliance and successful delivery of the project. She will report on the project status to the Project Principals on a monthly, or



as needed basis, including progress of work, schedule, budget, quality assurance and any major technical or approval issues.

Ms. Szumanski will be assisted by two **DEPUTY PROJECT MANAGERS**, **Richard Cross**, PE, (**GF**) and **David Tuckman**, PE, (**H&H**), who will serve as the **Project Engineers**, responsible for **overseeing the technical work** to ensure it satisfies the design requirements and **coordination of their respective technical disciplines**. Each will have a specific area of focus. **Mr. Cross**, who is the Track Director at GF, will be focusing on **track and systems work**, civil works on the approaches, and coordinating permitting/approvals discipline. **Mr. Tuckman**, who is one of the leading bridge design managers at H&H, will be focusing on the design of **structures and foundations**, **including alternative analysis** in support of the NEPA process.

While the Project Manager will be responsible for all aspects of a project, not just the engineering, to make sure that the work progresses as planned and the design meets the project goals, the Project Engineers will focus on getting the design activities done by managing the technical content. The PM and DPM's will act as checks and balances in their respective areas of responsibilities to facilitate the overall project delivery effort.

Our management team also includes a **PROJECT CONTROLS GROUP** focused on **managing the project records**, **schedule**, **and risk management**. **RISK MANAGER**, **Charlie Geer**, PE (H&H) will be responsible for **identifying**, **analyzing and monitoring project risks**. **Kurt Buettler** (EC) will supervise documents control and **Jim Douglass** (GF) will oversee the project scheduling.

QUALITY ASSURANCE MANAGERS, Steven Harlacker, PE, SE (H&H) and Bruce Smith, PE (GF), will be monitoring the quality processes of all disciplines, including the subconsultants, in accordance with the Project Quality Management Plan and reporting any quality issues directly to the Project Principals.

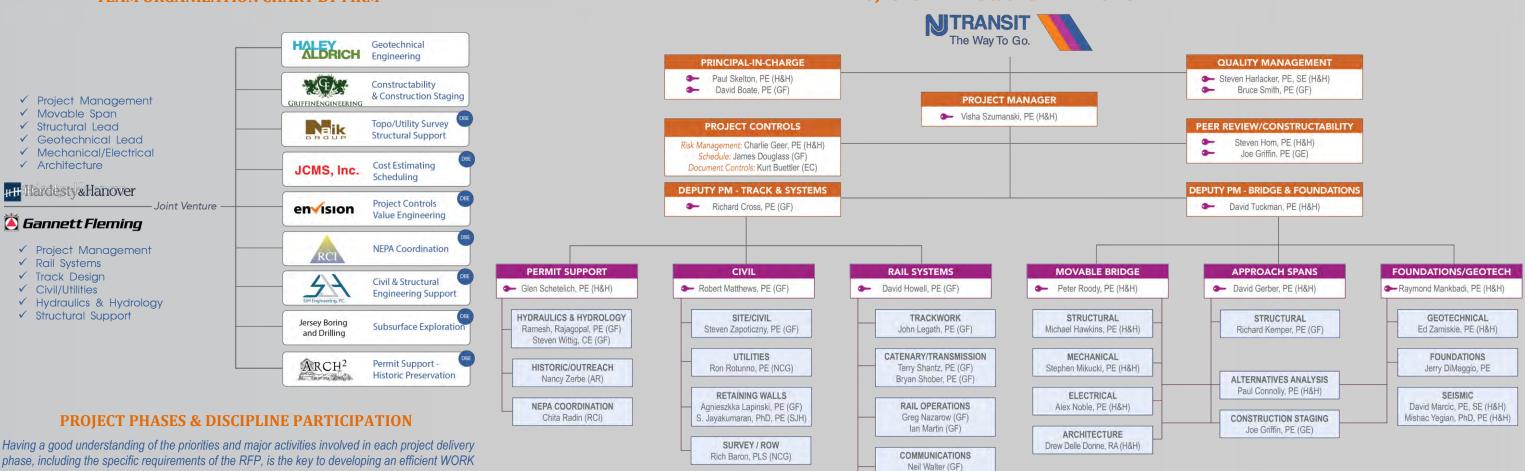
TASK MANAGERS – Since this project will involve a variety of design disciplines and require large number of staff working in concert to produce the design deliverables, we divided the design work into several major components, or Tasks, and assigned a Task Managers to guide the work of the individual teams and coordinate with other groups, as follows: Movable Span; Approach Spans; Foundation/Geotechnical; Rail Systems; and Civil Engineering.

Our **DISCIPLINE STAFF** covers full spectrum of professional disciplines required to deliver this project, including structural, civil, geotechnical, mechanical, electrical, systems engineers and architects, organized by the major tasks. Each of these key disciplines will be led by staff who have particular expertise in their respective areas. Some of them, will interface with more than one major task. For instance, **Alternative Analysis** and **Construction Staging** will be involved in the design of the Movable Span, Approach Spans and Geotechnical/Foundation. In order to streamline this work and ensure that it is done in a consistent and coordinated manner, we designated separate **SUBTASK MANAGERS** for these assignments.









LEGEND

DBE FIRMS

AR

NCG Naik Consulting Group

JBD Jersey Boring & Drilling

.... Arch²

RCI...... Radin Consulting

EC Envision Consultants, Ltd.

JCMS ... Jois Construction Management

H&H Hardesty & Hanover

GF..... Gannett Fleming

H&A Haley & Aldrich

🍉 KEY STAFF

GE Griffin Engineering

phase, including the specific requirements of the RFP, is the key to developing an efficient WORK PLAN and allocating adequate resources to the individual project tasks. Equally important is identifying the support the lead disciplines need to complete the work in each phase, to produce the required deliverables, and to achieve the milestones.

CONCEPTUAL DESIGN

- Surveys topographic/utility/ROW; navigation survey; site reconnaissance (all disciplines)
- Alternative Analysis all design disciplines; cost estimators; construction staging team
- Permit Support & NEPA Coordination all design disciplines under Task Manager lead
- Value Engineering value engineering team; all disciplines; cost estimating

PRELIMINARY DESIGN

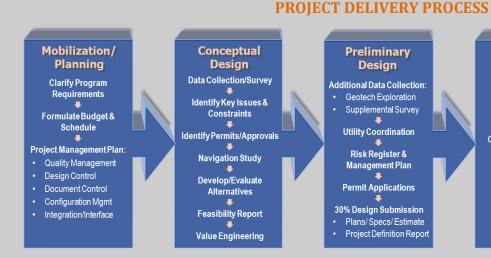
- Geotechnical Investigation geotechnical/foundation team
- 30% Design Package all design disciplines; cost estimators; schedulers; construction staging team
- Permit Support all design disciplines under Task Manager lead

FINAL DESIGN

- Peer Review peer review/constructability team; all design disciplines; cost estimators; schedulers
- Design Packages all design disciplines; cost estimators; schedulers; construction staging team
- · Constructability Reviews constructability team; all design disciplines; cost estimators; schedulers
- Bid Services key disciplines (structural, geotechnical, mech/elec, systems, civil); cost estimators; schedulers

CONSTRUCTION PHASE

- Submittals, RFIs key disciplines; cost estimators; schedulers
- Change Orders key disciplines; cost estimators; schedulers



James Sgro (GF)

SYSTEMS INTEGRATION

Theodore Bandy, PE (GF)

Stephen Barkovich (GF)

SIGNALS

Richard Lentz (GF)

Joseph Bonaduce (GE)



PROJECT STAFFING & ORGANIZATION CHART

PROJECT WIDE SUPPORT SERVICES

COST ESTIMATING Kevin Meehan (JCMS) CONSTRUCTION SCHEDULING Sebastian DiBlasi (JCMS) GEOTECH - SITE WORK & LAB Jersey Boring & Drilling (JBD)

VALUE ENGINEERING Tom Hartley, PE, CVS (EC) SAFETY & SECURITY Alireza Edraki, PEng, PMP (GF) McEwan van der Madele, CPP (GF)





MATRIX – PERSON-HOURS BY FIRM/TASK

1.000		1		2		3			4	5	5 8	6	2 2	13	7	8		C	9	10)	11	H2 - 58	TOTAL	
TASK	DESCRIPTION	H&H	н	G	F	H&A	Ą	G	E	NA	K	ENV	r I	AR	CH2	JCM	S	R	ADIN	SJ	н	DBE VEN	DORS	HOURS	% TOTAL
		Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	Hours	%	HOURS	
TASK 1	PROJECT MANAGEMENT	5,050	27.3%	5,637	30.5%	136	0.7%	0	0.0%	0	0.0%	6,860	37.1%	0	0.0%	784	4.2%	1 10	0 0.0	6 0	0.0%	0	0.0%	18,467	10.9%
TASK 2	RISK MANAGEMENT	592	97.4%	16	2.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0 0.0	6 0	0.0%	0	0.0%	608	0.4%
TASK 3	SYSTEM SECURITY & EMERGENCY MGMT	0	0.0%	610	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0 0.0	6 0	0.0%	0	0.0%	610	0.4%
PHASE I -	CONCEPTUAL & PRELIMINARY DESIGN				_								-				-		-						10000
PHASE IA	- CONCEPTUAL DESIGN	_	-	-						-															
TASK 4.1	Data Collection & Design Criteria	180	12.7%	1,239	87.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5 0	0 0.0	6 0	0.0%	0	0.0%	1,419	0.8%
TASK 4.2	Survey & Base Mapping	0	0.0%	168	19.2%	0	0.0%	0	0.0%	706	80.8%	0	0.0%	0	0.0%	0	0.0%		0 0.0		0.0%	0	0.0%	874	
TASK 4.3	Right-of-Way Search	0	0.0%	12	2.0%	0	0.0%	0	0.0%	594	98.0%	0	0.0%	0	0.0%	0	0.0%		0 0.0		0.0%	0	0.0%	606	
TASK 4.4	Utility Investigation	0	0.0%	179	17.9%	0	0.0%	0	0.0%	822	82.1%	0	0.0%	0	0.0%	0	0.0%		0 0.0		0.0%	0	0.0%	1,001	_
TASK 4.5	Initial Geotechnical Investigation	450	75.0%	12	2.0%	138	23.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0 0.0		0.0%	0	0.0%	600	
TASK 4.7	Navigation Study	448	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0 0.0		0.0%	0	0.0%	448	
TASK 4.8	Conceptual Design	3,604	44.1%	3,503	42.8%	0	0.0%	20		284	3.5%	0	0.0%	0	0.0%	568	6.9%	2			2.2%	0	0.0%	8,176	
TASK 4.9	Feasibility Report	584	41.0%	739	51.9%	0	0.0%	0	0.0%	100	7.0%	0	0.0%	0	0.0%	0	0.0%	1	0 0.0	_	0.0%	0	0.0%	1,423	
TASK 4.10	Value Engineering	160	21.8%	241	32.9%	0	0.0%	0	0.0%	0	0.0%	316	43.1%	0	0.0%	16	2.2%		0 0.09		0.0%	0	0.0%	733	
TASK 4.11	NEPA Consultant Coordination	200	29.9%	12	1.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	280	41.8%	0	0.0%	17			0.0%	0	0.0%	670	
	TOTAL PHASE IA	5,626	35.3%	6,105	38.3%	138	0.9%	20	0.1%	2,506	15.7%	316	2.0%	280	1.8%	584	3.7%	19	9 1.25	6 176	1.1%	0	0.0%	15,950	9.4%
PHASE IB	- PRELIMINARY DESIGN																								
TASK 4.12	Preliminary Design	6,042	38.1%	8,504	53.7%	0	0.0%	0	0.0%	312	2.0%	0	0.0%	0	0.0%	528	3.3%	32	0 2.09	6 136	0.9%	0	0.0%	15,842	8.1%
TASK 4.13		0	0.0%	0	0.0%	0	0.0%	0	0.0%	484	100.0%	0	0.0%	0	0.0%	0	0.0%		0 0.0		0.0%	0	0.0%	484	0.3%
TASK 4.14		0	0.0%	0	0.0%	0	0.0%	0	0.0%	152	100.0%	0	0.0%	0	0.0%	0	0.0%	· · · · · · · ·	0 0.09	6 0	0.0%	0	0.0%	152	
TASK 4.15		0	0.0%	0	0.0%	0	0.0%	0	0.0%	2,048	100.0%	0	0.0%	0	0.0%	0	0.0%	()	0 0.09		0.0%	0	0.0%	2,048	
TASK 4.16	Detailed Geotech Investigation	4,601	51.6%	0	0.0%	4,315	48.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0 0.0	6 0	0.0%	0	0.0%	8,916	5.3%
TASK 4.18	As Directed - Preliminary Design	600	40.0%	600	40.0%	0	0.0%	0	0.0%	300	20.0%	0	0.0%	0	0.0%	0	0.0%		0 0.0	6 0	0.0%	0	0.0%	1,500	0.9%
	TOTAL PHASE IB	11,243	42.0%	7,099	26.5%	4,315	16.1%	0	0.0%	3,296	12.3%	0	0.0%	0	0.0%	528	2.0%	16	0 0.69	6 136	0.5%	0	0.0%	26,777	15.9%
	TOTAL PHASE I	16,869	39.5%	13,204	30.9%	4,453	10.4%	20	0.0%	5,802	13.6%	316	0.7%	280	0.7%	1,112	2.6%	35	9 0.8	6 312	0.7%	0	0.0%	42,727	25.3%
PHASE II -	FINAL DESIGN																				_				
TASK 5.1	Design Development (60%)	10,390	38.4%	13,425	49.7%	0	0.0%	0	0.0%	1,564	5.8%	0	0.0%	0	0.0%	504	1.9%	30	4 1.19	6 844	3.1%	0	0.0%	27,031	16.0%
TASK 5.2	Final design (90%)	10,336	39.0%	13,150	49.6%	0	0.0%	30	0.1%	1,584	6.0%	0	0.0%	0	0.0%	280	1.1%	30			3.1%		0.0%	26,512	15.7%
TASK 5.3	Final design (100%)	2,335	28.9%	3,747	46.3%	0	0.0%	30	0.4%	1,292	16.0%	0	0.0%	0	0.0%	200	2.5%	10	4 1.39	6 384	4.7%	0	0.0%	8,092	4.8%
TASK 5.4	Peer Review (at 50% Completion)	120	42.0%	46	16.1%	0	0.0%	120	42.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0.09	6 0	0.0%	0	0.0%	286	0.2%
TASK 5.5	Interagency Coordination - As Directed	200	40.0%	200	40.0%	0	0.0%	0	0.0%	100	20.0%	0	0.0%	0	0.0%	0	0.0%		0.09	6 0	0.0%	0	0.0%	500	0.3%
TASK 5.6	As Directed	200	40.0%	200	40.0%	0	0.0%	0	0.0%	100	20.0%	0	0.0%	0	0.0%	0	0.0%		0.09	6 0	0.0%	0	0.0%	500	
TASK 5.7	Construction Bid Package	1,400	31.5%	2,335	52.5%	0	0.0%	0	0.0%	212	4.8%	0	0.0%	0	0.0%	250	5.6%	4	0 0.9	6 214	4.8%	0	0.0%	4,451	2.6%
	TOTAL PHASE II	24,981	37.1%	33,103	49.1%	0	0.0%	180	0.3%	4,852	7.2%	0	0.0%	0	0.0%	1,234	1.8%	75	2 1.19	6 2,270	3.4%	0	0.0%	67,372	39.9%
PHASE III -	-CONSTRUCTION SUPPORT SERVICES			-																			_		
TASK 6.1	Responses to RFIs	3,272	47.9%		30.5%	540	7.9%	0	0.0%	580	8.5%	0	0.0%		0.0%	0	0.0%		0.0		5.2%		0.0%	6,828	
TASK 6.2	Change Order Evaluation	456	34.8%		65.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0.0%	0	0.0%		0 0.0		0.0%		0.0%	1,310	
TASK 6.3	Review of Contractor's Submittals	13,972	50.1%		31.5%	2,260	8.1%	0	0.0%	1,604	5.7%	0	0.0%		0.0%	0	0.0%	1	0 0.0		4.6%		0.0%	27,910	
TASK 6.4	Punch List Inspection	144	49.3%		50.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0.0%	0	0.0%	(1	0 0.0		0.0%		0.0%	292	
TASK 6.5	Final Inspection	144	50.7%	140	49.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0.0%	0	0.0%	1	0 0.0		0.0%		0.0%	284	
TASK 6.6	As-Build Drawings	512	26.7%		73.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%		0.0%	0	0.0%		0 0.0		0.0%		0.0%	1,918	
TASK 6.7	Design Support - As Directed	200	40.0%	200	40.0%		0.0%		0.0%	100	20.0%	0	0.0%		0.0%		0.0%	_	0.09	6	0.0%	0	0.0%	500	0.3%
	TOTAL PHASE III	18,700	47.9%	13,620	34.9%	2,800	7.2%	0	0.0%	2,284	5.9%	0	0.0%	0	0.0%	0	0.0%	(10.000)	0.09	6 1,638	4.2%	0	0.0%	39,042	23.1%
	PROJECT TOTAL	66,192	39.2%	66,190	39.2%	7,389	4.4%	200	0.1%	12,938	7.7%	7,176	4.3%	280	0.2%	3,130	1.9%	1.11	1 0.79	4,220	2.5%		0.0%	168,826	100.0%

NON-DBE FIRMS
DBE FIRMS



Note - DBE Vendors include:

1. Jersey Boring - Geotechnical Investigation (7.6% of Fee)

2. Esteban - Reproduction (0.7% of Fee)



NON-DBE FIRMS DBE FIRMS																																												
							_	~	PHA	SE IA -	CONCEPTU	AL DES	GN									PHASE I	- PRELIM	INARY DE	SIGN							PHASE	II - FINAL	DESIGN			F	PHASE III	- CONSTR	UCTION S	UPPORT S	ERVICES		
NO. PERSON NAME	PROJECT TITLE OR DISCIPLINE					TASK	TASK 4.2	TASK		К Т/	ASK TAS					TASK	1262		-	ASK 12 - P								SK TASH			TASK	TASK 5.3	TASK	TASK	TASK	TASK	TASK 6.1	TASK 6.2	TASK 6.3	TASK				TOTAL
FIRM			Project Management	Visk Management XSV	System Security	Jata Collection 1.	Survey & Mapping	KOW Research 5.4	Jtility Investigation		Seotech Investigation 57 Vavigation Study 2.1	Annountied Provine	lifie	easibility Report 64	/alue Engineering	VEPA Coordination 11	Design Criteria	Sridge Design	rack Design	4.12.D	Sulfings & Facilities	P / Electrical	Signal Systems 55	Communications 17	Cost & Schedule	ientai Survey	Property	Investigation	As Directed 81.7	Jesign Develop (60%)	inal Design (90%) 55	inal Design (100%)	beer Review 5	Agency Coordination 5	9.5 As Directed	3id Package	Responses to RFIs	Change Orders 79	Submittal Review	ounch List Inspection 99	inal Inspection	As-Built Drawings 39	Design Support	HOURS
TECHNICAL STAFF			<u>a 1</u>	DE	S		0	1 DE	1 2		UIZ	1 4	2	<u>u</u>	>	Z	0 1			101			S L	0 1	0 1	0 1		5 0	14		1	1 14	4					10	100		. u.	4		
1 Visha Szumanski, PE 2 Charlie Geer, PE 3 David Tuckman, PE 4 Steve Harlacker, PE, SE 5 Steve Hom, PE 6 Peter Roody, PE 7 Michael Hawkins, PE 8 Steve Mikucki, PE 9 Alex Noble, PE 10 Paul Connolly, PE 11 Glen Schetelich, PE 13 Mishac Yegian, PE, PhD 14 David Marcic, PE, SE 15 Jerry DiMaggio, PE 16 David Gerber, PE 17 Drew DelleDonne, RA SUPPORT STAFF 18 20 Support Staff 20 Support Staff 21 Support Staff	PM, STR Eng VIII Risk Manager DPM, STR Eng VII QAQC, STR Eng VII STR Eng VII STR Eng VIII STR Eng VIII MECH Eng VII STR Eng VII STR Eng VIII STR Eng VIII STR Eng VIII STR Eng VIII STR Eng VIII STR Eng VII STR Eng VII		22910 0 1604 536 0 0 0 0 0 0 0 0 0 0 0 0 0		000000000000000000000000000000000000000	0 0 0 0 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 1 80 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 100 120 90 90 280 0 224 0 2210 0 22210 0 0 282 0 0 282 0 0 282 0 0 282 4 40	0 0 0 36 48 24 36 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 48 16 12 12 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 16 16 16 16 16 16 0 0 0 0	0 0 372 280 280 280 200 0 80 0 100 60 80 0 0 100 80 80 0 100 80 80 100 80 80 80 80 80 80 80 80 80							0 0 0 100 50 50 50 20 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 364 0 314 0 3140 0 3140 0 <td< td=""><td>350 300 0 0 144 60 20 20 268 214 3424 1036 956</td><td>0 0 0 1000 1688 1400 124 124 124 124 124 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td></td><td></td><td></td><td>0 0 0 0 1244 74 74 74 74 74 0 0 0 0 0 0 0 0 0 0 0</td><td>100 90 90 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>40 40 20 200 20 200 20 200 20 200 20 00 20 00 20 00 20 00 20 00 20 00 20 00 20 00 2100 400</td><td>360 360 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>24 24 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>24 24 0 0 0 0 0 0 0 0 0 0</td><td>0 0 0 28 16 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td></td><td>2910 592 1604 536 372 3638 2030 1822 560 204 1634 223 450 100 918 1070 24880 6134 5970 7523</td></td<>	350 300 0 0 144 60 20 20 268 214 3424 1036 956	0 0 0 1000 1688 1400 124 124 124 124 124 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				0 0 0 0 1244 74 74 74 74 74 0 0 0 0 0 0 0 0 0 0 0	100 90 90 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	40 40 20 200 20 200 20 200 20 200 20 00 20 00 20 00 20 00 20 00 20 00 20 00 20 00 2100 400	360 360 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	24 24 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	24 24 0 0 0 0 0 0 0 0 0 0	0 0 0 28 16 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		2910 592 1604 536 372 3638 2030 1822 560 204 1634 223 450 100 918 1070 24880 6134 5970 7523
TOTAL ESTIMATE		5	,050	592	0	180	0		0	0	450 4	48 3,		584	160	200		5,016					0	0	698	.0	0	0 4,60				2,335	120	200	- · · · · · · · · · · · · · · · · · · ·	1,400		456	13,972	144	144		200	66,192
TECHNICAL STAFF 1 Richard Cross, PE 2 David Howell, PE 3 Bruce Smith 4 Robert Matthews, PE 5 Steven Zapoticzny, PE 6 Agnieszkka Lapinski, PE 7 John Legath, PE 8 Terry Shantz, PE 9 Bryan Shober, PE 10 Greg Nazarow 11 Ian Martin 12 Neil Walter 13 James Sgro 14 Theodore Bandy, PE 15 Stephen Barkovich 16 Richard Lentz 17 Joseph Bonaduce 18 Alireza Edraki, PE, PMP 19 McEwan van der Mandele, CPP 20 Ramesh Rajagopal, PE 20 Ramesh Rajagopal, PE	DPM Rail Sys. Lead Quality Control Civil Lead Site/Civil Ret. Walls Track Cat/ Trans Cat/ Trans Cat/ Trans Cat/ Trans Cat/ Trans Cat/ Trans Cat/ Trans Cat/ Trans Cat/ Trans Cat/ Trans Signals Sys. Integ. Signals Signals Safety & Sec. Safety & Sec. Hydraulics & Hydrology		3410 0 294 284 0 0 24 0 0 24 0 0 24 0 0 24 0 0 24 0 0 24 122 24 0 0 0 94 128 15 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 480 0 64 200 42 436 224 22 20 0 0 20 0 0 28 280 4 40 0 0 0 0 0 0	0 0 24 48 27 36 0 6 6 6 6 6 6 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 12 36 0 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 480 0 0 20 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		D 0 00 400 00 400 00 648 00 6460 00 248 00 0 00 0 00 0 00 0 00 0 00 280 00 0 00 0 00 0 00 0 00 0 00 0	0 216 624 340 520 24 248 0 0 0 0 52 52 16 36	0 80 216 88 156 24 88 0 0 0 0 24 8 6 6 120	0 0 0 36 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 32 0 0 24 8 6	0 24 56 112 32 0 0 0 0 0 0 0 12 4 4 10) 0 4 24 5 56 2 112 2 32 0 0 3 4 0 0 2 12 4 4	0 103 360 32 30 0 0 30 0 0 12 12 4 4 50	8 32 0 0 0 0 12 4	0 0 0 12 4 0	0 0 0 8 24 120 32 0 120 12 0 12 12 0 120 2 0 0 0 0 0 0 0		3410 2208 294 1180 2535 2661 120 924 74 74 74 602 156 334 1494 45 80 80 540 360 64
21 Technical Support Staff 22 Administrative Support Staff	Eng. Staff CAD/ ADMIN	-	1344	0	-	727		-		07 40	0		451 386	378 208	117 70	0		480 392		608			26 40	211 204	4	0	0	0		0 7240		1956 901		0		1319 480			8177			602 464		35254 10818
TECHNICAL STAFF 1 Ed Zaminskie, PE 2 Senior Engineering Staff 3 Engineering Staff 4 Junior Engineering Staff SUPPORT STAFF 5 CADD/ Project Assistant TOTAL ESTIMATER	Lead Geotechnical Eng. Sen. Eng Staff Eng Staff Jr. Eng Staff CAD/ ADMIN	9-	,637 72 8 0 0 56 136		610 0 0 0 0	1,239 0 0 0 0			0 0 0 0	0 0 0 0 0	48 14 0 21 55 138			739 0 0 0 0 0			579 0 0 0	1,336 0 0 0 0 0		1,400 0 0 0 0 0 0	000000000000000000000000000000000000000	2,005 0 0 0	0 0 0 0 0 0 0		26 0 0 0 0 0			0 18	0 60 60 60 99 60	and the second se	13,150 0 0 0 0	3,747 0 0 0 0	46 0 0 0 0		200 200 0 0 0 0 0 0 0 0	2,335 0 0 0 0	2,080 40 0 220 280	0 854 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8,792 100 0 760 1400	148 0 0 0 0	140 0 0 0		200 0 0 0	
U Joe Griffin, PE TOTAL ESTIMATE	Const. Rev. D HOURS	1	0	0	0	0			0	0	0	0	20 20	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0		30		120 120			0	0		0	0	0	0	0	200 200
TECHNICAL STAFF 1 Naik Consulting Group 2 Envision 3 Arch2 4 JCMS 5 Radin 6 SJH	Surv./Utilities/Str./CAD Project Controls / VE Historic Preservation Estimating/ Schedule NEPA Coord./ CAD Structures D HOURS	6	0 ,860 0 784 0 0 0	0 0 0 0 0 0	000000000000000000000000000000000000000		706 00 00 00 00 00 00 00 00 00 00 00 00 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 22	0 0 0 0 0 0	0 0 0 0	284 0 568 21 176 049	100 0 0 0 0 0 100	0 316 0 16 0 332	0 280 0 178 0 458	0 0 0	000000000000000000000000000000000000000			000000000000000000000000000000000000000	0	0 0 0 0 0 0 0	0	56 0 528 0 48 632	484 0 0 0 0 0 484	152 2 0 0 0 0 0 152 2	0 0 0 0	0	0 (0 0 (0 0 504 0 304 0 844	0 0 280 304 828	0 200 104 384	000000000000000000000000000000000000000			0 0 250 40 214	0 0 356		1,604 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0	0	0 0 0 0 0 0 0 0	0 0 0 0	12,938 7,176 280 3,130 1,111 4,220 28,855





Request For Proposal (RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the

RARITAN RIVER DRAWBRIDGE



SECTION 8 Quality Assurance Plan

Section 8 Quality Assurance Plan









SECTION 8: QUALITY ASSURANCE PLAN

The H&H/GF Joint Venture Team recognizes the importance of developing, implementing and enforcing quality assurance/quality control procedures on complex, multi-discipline engineering design projects such as the Raritan River Bridge Project. The H&H/GF JV have chosen the Gannett Fleming quality assurance program as the basis of this project's Quality Management Plan (QMP).

Our Team has developed, updated, and improved their in-house quality management procedures to address the specialized design requirements and life-safety aspects associated with rail infrastructure and systems design projects: strict adherence to design criteria, thorough coordination and integration of design disciplines, review of multi-discipline constructability, railroad force account activities and construction sequencing, and verification of all submittals before delivery to the client and other reviewing agencies. The intent of these quality activities is to assure a technically correct project and to identify issues before they result in unanticipated schedule delays and budget over runs.

The quality requirements are detailed in our Quality Management System (QMS). Our QMS is based on the requirements of the International Organization for Standardization, Quality Management Systems – Requirements (ISO 9001:2008). Their QMS addresses the six major quality management elements required of the international standard, including quality policy, control of documents and records, management responsibility, resource management, product realization and measurement, analysis and improvement. An independent registrar audits a sampling of Gannett Fleming personnel and projects on a yearly basis to verify and certify that the Team's QMS is compliant with the requirements of ISO 9001:2008.

To assure project quality, the QMP:

- Assigns personnel with the proper skills and experience to match client expectations.
- Conducts project kick-off meeting with the client and conducts internal project kick-off meeting with all team members, including subconsultants.
- Conducts design review meetings (internal and with the client): on multi-discipline projects GFT&RS conducts design coordination / integration meetings between disciplines, and systems interface meetings.
- Identifies and documents design criteria, CAD standards and legal requirements. Centralizes the location of this information so all team members refer to the same source.
- Verifies that deliverables meet design criteria, CAD standards and follows recommended practice before submittal to the client.
- Conducts quality audits of projects and processes and addresses audit findings requiring corrective action.

The QMP will emphasize the importance of developing quality deliverables for NJ TRANSIT. A major element of the QMP will be the procedure that details the requirements for checking, backchecking, correcting and verifying of all deliverables before submittal to NJ TRANSIT. The deliverable checking procedures are developed specifically to address the specialized project coordination, design requirements and life-safety aspects associated with rail transit and railroad design projects. H&H/GF JV will allow our subconsultants to utilize their own QA/QC procedures, subject to approval by the H&H/GF JV Team and NJ TRANSIT. However, all firms carrying out design work will follow the document checking and verification procedures.

Each deliverable document produced by H&H/GF JV Team will be checked prior to formal submission to NJ TRANSIT. Each firm is responsible for checking their documents in accordance with the QMP. All firms on the H&H/GF JV Team will maintain records of their reviews, including check sets of drawings, calculations, specifications, cost estimates and reports. The intent of document checking is to assure that deliverables are complete, technically correct, of high quality and meet the requirements and expectations of NJ TRANSIT. The Project Manager, coordinating with the Quality Manager, Deputy Project Managers, and Discipline Leaders, is responsible for:

- 1. Scheduling the document checking review period in advance of each submittal. Providing the schedule and subsequent updates to all persons assigned to the project.
- 2. Providing sufficient time and budget to carry out the document checking.







- 3. Identifying qualified individuals to serve as Checker, Backchecker, Corrector and Verifier; verifying that the selected individuals are available during the review period.
- 4. Completing all design discipline coordination and systems integration reviews in advance of the document checking phase. The document checking phase is not intended to serve as a detailed design coordination review between disciplines and subconsultants; this detailed coordination is an on-going activity that takes place in advance of the document checking review.
- 5. Suspending the design work on the deliverables during the checking and verification phases. New work is not to be carried out on the deliverables until the checking and verification is completed and approved; and, the deliverables have been properly archived.
- 6. Assuring that the checking and verification of deliverables is carried out in accordance with the procedures outlined in the QMP.

The submittal documents are developed to the level of detail that the Designer and Discipline Leaders consider as reasonable for the upcoming submittal. The Designer and Discipline Leaders should consider the document as ready for review by the time that the document checking phase is scheduled to start; major changes to the document are not anticipated.

The H&H/GF JV Team (including subconsultants) will schedule coordination meetings on a regular basis throughout the duration of the project. The intent of the meetings is to make sure that client input, design requirements and documents are properly coordinated with respect to design responsibility, standards and document format. The H&H/GF JV will review subconsultant submittals to assure that they properly interface with the H&H/GF JV designs and documents.

CHECKER	
	BACKCHECKER
CORRECT: Mark with BLUE Hi-lighter or pencil, each item that has been both checked and determined to be correct.	Mark with GREEN Hi-lighter or pencil each item on the Check Copy that has been back-checked and that should be implemented by the Corrector.
	CORRECTOR
ADDITIONS: New or replacement objects and text will be written in pencil and circled or hi-lighted in YELLOW.	Mark over with ORANGE Hi-lighter or pencil each iter that has been added, changed or deleted pe Checker/Backchecker markings.
	VERIFIER
DELETIONS: All objects and text that are to be removed will be crossed out with RED pencil or ink.	Mark with BLUE Hi-lighter or pencil, each item on th Check Copy that has been properly implemented and eac item on the new set of documents that has been correctl incorporated.



Request For Proposal (RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the **DADITANI DIV**

RARITAN RIVER DRAWBRIDGE



section 9 Schedule







Section 9 Schedule



Key Milestones / Summary O Phase IA - Conceptual Design S05 Notice to Proceed S10 All Project Requirement S15 In-House QA Review of S20 Conceptual Design Sub S25 NJT Review Conceptual S27 Conceptual Design Com Phase IB - Preliminary 20% Design S29 S29 Preliminary Design Notic S30 In-House QA / Peer Rev S40 Constructability Review S41 NEPA Approval of Envice S45 NJT Review Preliminary S47 Preliminary Design Com Phase II - Final Design Notice to F S60 S65 Final Design 100% Subm S70 Final Design 100% Subm S75 Final Design 1	ent Plans Submitted and Approved of Conceptual Design Submission Submission to NJT tual Design Submittal Complete Seign Bolice to Proceed Authorized Review of Preliminary Design Submission ew of Preliminary Design Submission ew of Preliminary Design Submission ew of Preliminary Design Package tubmission to NJTA twomental Doc nary Design Package (30%) complete to Proceed ubmission Submission Submission Submission Submission	Cal Days 1097 814 203 0 0 0 14 0 0 21 0 21 0 205 0 14 14 14 0 0 205 0 0 14 48 0 0 0 21 0 0 448 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Finish 01-Apr-21 02-Mar-18 28-Jun-16 08-Mar-16* 25-May-16 07-Jun-16 28-Jun-16 28-Jun-16* 28-Jun-16* 29-Dec-16 08-Dec-16 08-Dec-16 08-Dec-16 08-Dec-16* 02-Mar-18 27-May-17 08-Dec-17	Total Float	Poposal Schedule N 2016 N D Jan F M Apr M Jul A S Oct N D Jan F M Apr M Jul A S Oct Notice to Proceed In-House OA Review of Conceptual Design Submission Conceptual Design Submission NJT Review Conceptual Design Submittal Conceptual Design Notice to Proceed Preliminary Design Notice to Proceed Authorized In-House OA / Peer Review of Preliminary Design Submission to N. NUT Review Preliminary Design Submission to N. NUT Review Preliminary Design Complete Preliminary Design Complete Preliminary Design Complete Final Design Notice to Proceed Final Design Notice to Proceed	Key Milestones / Summary Overview ign ninary Design Submission ary Design Package JTA Package (30%) Phase II - Final Design 160% Submission
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1185 Progress Meeting Minute Subtask 1.14 - Payment Procedures		800	19-Dec-15	25-Feb-18	4	Kick Off Meeting	Subtask 1.13 - Project Meetings
Subtask 1.14 - Payment Procedures	nutes	0 800	19-Dec-15 19-Dec-15	25-Feb-18	4		Progress Meeting Minutes
1190 Application for Payment	res	800	09-Dec-15	15-Feb-18	14		Subtask 1.14 - Payment Procedures
Tools 2 Dials Management	ent (Monthly Invoices)	800	09-Dec-15	15-Feb-18	14		Application for Payment (Monthly Invoices)
Task 2 - Risk Management 1240 Draft Risk Register		686 10	03-Jan-16 03-Jan-16	18-Nov-17 12-Jan-16	103 103	→ Dratt Risk Register	
1245 Preliminary Risk Worksh		14	27-Jan-16	09-Feb-16	103	Freiminary Risk Workshop	
1252 Risk Register and Risk Marthly Bigk Bagister	sk Management Plan	28	10-Feb-16	08-Mar-16	103	Risk Register and Risk Management Plan	Monthly Risk Register Updates
1255 Monthly Risk Register U Task 3 - System Security Mgt Pla		620 91	09-Mar-16 09-Dec-15	18-Nov-17 08-Mar-16	103	Task 3 - System Security Mgt Pan [SSMP]	
1270 Draft SSMP	er Updates	40	09-Dec-15	17-Jan-16	7	► Draft SSMP	
1275 NJT Review and Commo	er Updates	21	18-Jan-16*	07-Feb-16	7	Final SS //P Final SS //P Final SS //P	
1280 Final SSMP Phase IA - Concentual Design	er Updates Plan (SSMP)	30 135	08-Feb-16 09-Dec-15	08-Mar-16 14-Jun-16	7 127	Phase IA - Conceptual Design	
Phase IA - Conceptual Design Task 4.1 - Data Collection and Design	er Updates Plan [SSMP] mment of Draft SSMP	45	09-Dec-15	22-Jan-16	115	Task 1 1 - Data Collection and Design Criteria	
1400 Submit Conceptual Desi	er Updates Plan [SSMP] mment of Draft SSMP ign	45	09-Dec-15	22-Jan-16	115	←Subnit Conceptual Design Criteria	







Date 09-	Proposal Schedule R22 dated 14Jul15 1215.xer Dec-15					
D	Activity Name	Cal Days	Prelim Start	inary De	sign F	n Proposal Schedule
		our Duys	Otart	T IIII SIT	Float	
	urvey and Base Mapping	120 90	09-Dec-15	06-Apr-16 07-Mar-16	40 65	Task 4.2 - Survey and Base Mapping
1420 1425	Survey Develop Base Mapping	90	09-Dec-15 14-Dec-15	12-Mar-16	65	Develor Base Mapping
1430	Submit Base Mapping Data	0	11 200 10	06-Apr-16	40	Submit Base Mapping Data
Task 4.3 - R	ight of Way Research	160	09-Dec-15	16-May-16	0	Task 4.3 - Right of Way Research
1450	Submit Property Files Data	110	09-Dec-15	27-Mar-16	0	Submit Property Files Data
1455	Identify ROW Potential Impacts and Cost (with Feasibility Report -FR] - Provide to NEPA Consultant	50	28-Mar-16	16-May-16	0	
Task 4.4 - U 1470	tility Investigations List of Arae Utilities / Contact Information	160 110	09-Dec-15 09-Dec-15	16-May-16 27-Mar-16	0	List of Arae Litilities / Contact information
1475	Utilities Potential Impacts / Mitgation Costs (with FR) –Provide to NEPA Consultant	50	28-Mar-16	16-May-16	0	Lilities Potential Imparts / Mitgation Costs (with FR)Provide to NEPA Donsul Task 45 - Initial Geotechnical Investigations / Concept Geotech Report
	nitial Geotechnical Investigations / Concept Geotech Report	160	09-Dec-15	16-May-16	0	Task 45 - Initial Geotechnical Investigations / Concept Geotech Report
1490	Concept Level Geotechnical Report	90	09-Dec-15	07-Mar-16	0	Concept Level Geotechnical Report
1495	Geotechnical Design to assess Conceptual Foundation Cost (with FR)	70	08-Mar-16	16-May-16	0	Geotechnical Design to assess Conceptual Foundation Cost (with FR)
	avagation Study	160	09-Dec-15	16-May-16	0	Task 4.7 - Navagation Study Task 4.7 - Navagation Study Task 4.7 - Navigation Study Report
1520 1525	Draft Navigation Study Report Final Navigation Study Report (with FR)	110 50	09-Dec-15 28-Mar-16	27-Mar-16 16-May-16	0	Final Navigation Study Report (with FR)
	onceptual Design	160	20-Iviar-16 09-Dec-15	16-May-16	0	Task 4.8 - Conceptual Design
1540	Conceptual Design Study (10% Level) with Construction Schedules (with FR)	160	09-Dec-15	16-May-16	0	Conceptual Design Study (10% Level) with Construction Schedules (with FR)
	easibility Report	182	09-Dec-15	07-Jun-16	0	Task 4.9 - Feasibility Report
1550	Draft Feasibility Report with Attachmnets Reports Listed Above)	160	09-Dec-15	16-May-16	0	Draft Feasibility Report vith Attachmets Reports Listed Above)
1552 1555	NJT Review Draft Feasibility Report	14	17-May-16	30-May-16	8	Indi Review Uran Feasibility Report
	Final Feasibility Report Value Engineering	14 49	25-May-16 07-Apr-16	07-Jun-16 14-Jun-16	12	
1570	Submit VE Team Qualifications	15	07-Apr-16	21-Apr-16	15	Submit VE Team Qualifications
1575	Prepare VE Agendas	10	22-Apr-16	01-May-16	15	Frepare VE Agendas
1580	VE Workshop	7	17-May-16	23-May-16	0	VE Workshop
1585	Draft VE Review Report to NJT	1	24-May-16	24-May-16	0	Draft VE Review Report to NJT Presentation Meeting & VE Report to NJT
1590 1595	Presentation Meeting & VE Report to NJT Comments on VE Report	7	25-May-16	31-May-16	23 16	
1595	VE Comments on VE Report VE Comment Resolution / Complete Value Engineering	5	25-May-16 07-Jun-16	07-Jun-16 14-Jun-16*	10	
	NEPA Consultant Coordination	180	09-Dec-15	05-Jun-16	186	Task 4.11 - NEPA Corsultant Coordination
1600	Coordination with NEPA Consultant on Environmental Screening Report for NEPA Approval	180	09-Dec-15	05-Jun-16	186	
Phase IB - I	Preliminary Design (30%)	146	08-Jun-16	28-Dec-16	7	Phase IB - Preliminary Design (30%)
	Drawings, Specs, Estimate and Construction Schedule	122	08-Jun-16	24-Nov-16	0	Task 4.12 - Drawings Specs, Estimate and Constru
1702	Project Definition Report	30	08-Jun-16	19-Jul-16	66	
1705	Preliminary Design (30%)	170	08-Jun-16	24-Nov-16	0	Rreliminary Desigh (30%)
Task 4.13 - 1710	Conduct Supplemental Survey	30 30	08-Jun-16 08-Jun-16	07-Jul-16 07-Jul-16	104 104	
	Right-of Way and Property Acquistion Identification & Estimating	140	08-Jun-16	25-Oct-16	44	
1720	Property Files	110	08-Jun-16*	25-Sep-16	44	Property Files
1725	Individual Parcel Maps	90	08-Jun-16	05-Sep-16	44	
1730	Preliminary Assessment Report	50	06-Sep-16*	25-Oct-16	44	
1735	General Property Parcel Maps (50% PE)	50	06-Sep-16	25-Oct-16	44 34	
1750	Utility Relocation Preliminary Estimates	150	08-Jun-16 08-Jun-16	04-Nov-16 04-Nov-16	34	
	Detailed Geotechnical Investigation	204	08-Jun-16	28-Dec-16	9	Task 4 16 - Detai ed Geotechnical I vest gation
1760	Geotechnical Investigation Plan	14	08-Jun-16	21-Jun-16	9	Geotechnical Invest gation Plan
1765	Boring and Testing Program	180	22-Jun-16	18-Dec-16	9	Boring and Testing Program
1770	Submit Geotechnical Report	40	19-Nov-16	28-Dec-16*	9	Submit Geotechrical Report
	inal Design & Bid Services	365	09-Dec-16	08-Dec-17	0	
	esign Development (60%)	170	09-Dec-16	27-May-17	0	Task 5.1 - Design Develop
1800	Final Design 60%)	170	09-Dec-16	27-May-17	0	Final Design 60%)
Task 5.2 - D 1815	esign Development (90%) NJT Review FD 60% Plans and Comments & Conduct Constructability Review	130 21	28-May-17 28-May-17	04-Oct-17 17-Jun-17	109	
1820	Final Design (90%)	130	28-May-17	04-Oct-17	0	inal De
	esign Development (100%)	35	05-Oct-17	08-Nov-17	0	
1835	NJT Review FD 90% Plans and Comments & Conduct Constructability Review	14	05-Oct-17	18-Oct-17	21	
1840	Final Design (100%)	35	05-Oct-17	08-Nov-17	0	Task 5.4 Peer Review Re
Task 5.4 P 1850	Peer Review Report Peer Review and Repoit at 50% Design Level	20	28-Apr-17	17-May-17	140 140	
	nteragency Coordination - Final Design	340	28-Apr-17 30-Dec-16	17-May-17 04-Dec-17	4	
1855	Interagency Coordination - Final Design	340	30-Dec-16	04-Dec-17	4	
	s - Directed Final Design	340	30-Dec-16	04-Dec-17	4	
1860	As - Directed Final Design	340	30-Dec-16	04-Dec-17	4	
	Contract Bid Package	30 30	09-Nov-17	08-Dec-17	0	
1880 Phase III (Prepare Bid package	1210	09-Nov-17 09-Dec-17	08-Dec-17 01-Apr-21	0	
Bid / Award	Construction Support Services -Tasks 6.1 - 6.7	1180	09-Dec-17	02-Mar-21	0	
1900	Advertise / Receive Bids / Award	80	09-Dec-17	26-Feb-18	0	
1910	Construction NTP	0	27-Feb-18		0	
1920	Mobilization	20	27-Feb-18	18-Mar-18	0	
1930	Stage 1 thru 7	1080	19-Mar-18	02-Mar-21	0	
Project Clos		30	02-Mar-21	01-Apr-21	0	
1940	Substantial Completion	0	03 Mar 24	02-Mar-21	0	
1950 1960	Punch List / Project Closeout Project Complete	30	03-Mar-21	01-Apr-21 01-Apr-21	0	
1000	r loject complete	0		01-Apr-21	0	





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Request For Proposal (RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the **DADITANI DIV**

RARITAN RIVER DRAWBRIDGE



SECTION 10 Appendix – Additional Qualifications





NIANTIC RIVER BRIDGE REPLACEMENT



EAST LYME AND WATERFORD, CONNECTICUT

Client: Amtrak Contact: Completion Date: 2013 Construction Cost: \$140 million



PROJECT HIGHLIGHTS

- Off-line replacement of Northeast Corridor bridge
- New 140 ft. single leaf bascule
- 100 ft. channel with 75 ft. min. vert. clearance
- 2 miles of track realignment
- Auto tensioned catenary
- · Unique structural system with two separate counterweights

KEY STAFF INVOLVEMENT:

Paul Skelton – Principal-in-Charge	(H&H)
Steven Hom – Deputy Project Manager-Construction	(H&H)
Stephen Harlacker – Structural Engineer	(H&H)
Michael Hawkins – Deputy Project Manager-Design	(H&H)
Peter Roody – Lead Structural Engineer	(H&H)
Richard Cross – Deputy Project Manager-Rail Systems	(GF)
John Legath – Track & Civil Engineer	(GF)
Bruce Smith – Quality Manager	(GF)
Terry Shantz - ET Discipline Lead	(GF)

Hardesty & Hanover, with Gannett Fleming (GF) as a subconsultant, was responsible for the design of \$140 million replacement of the Niantic River Drawbridge on Amtrak's Northeast Corridor mainline, which serves as a key link for the passenger and freight rail traffic between New York and Boston, carrying 54 trains daily, including Amtrak, ConnDOT's Shore Line East commuter rail and P&W Railroad.

In order to minimize impact on rail operations, the new 140 ft. long single-leaf bascule span carrying two railroad tracks was constructed 58 feet south of the existing railroad alignment. H&H developed a unique structural system comprised of separate counterweights integral with each of the main bascule girders in order to eliminate complexities associated with the overhead catenary system during bridge openings. In the closed position, the new bridge provides 16 feet of vertical clearance (four-foot increase). In the open position, the bridge provides a 100-foot-wide navigation channel with a 75-foot minimum vertical clearance and unlimited vertical clearance for an 80-foot width. The project included two miles of track realignment on the east and west approaches, handled by GF.

PORT ADELAIDE BASCULE BRIDGES



Paul Skelton – Principal-in-Charge Peter Roody – Design Project Manager David Tuckman – Project Engineer Stephen Mikucki – Mechanical Engineer David Marcic – Structural/Seismic Engineer

Hardesty & Hanover was the primary bridge engineer on a \$178 million Port River Expressway Design/Build project which added a four-lane expressway and a rail link connecting major port in Adelaide, Australia, to the mainline rail network and interstate highway system. Construction of the Port River Expressway was an important component of the state infrastructure plan intended to provide better links to the port enterprises in support of trade and economic development.

Hardesty & Hanover designed a new, **61-meter long (200 ft.)**, **single-leaf**, **single track railroad bridge** and a 58-meter long (190 ft.), four-lane, single-leaf highway bascule bridge. The design was in accordance with the Australian (AS5100) Bridge Code and the AREMA manual, which was used for movable bridge requirements.

Special attention was given to the aesthetics of the bridges by employing creative architectural forms. The bascule piers, which normally dominate the appearance of single-leaf bascule bridges, are "V" shaped post-tensioned concrete members. The piers geometry features angles complementary to the open-span angle. The bascule girders are welded steel boxes, carefully detailed by H&H architects and engineers to achieve a sleek and continuous look. The electrical and machinery rooms are enclosed with a glass curtain wall.

🎑 Gannett Fleming

Hardesty &Hanover



CHAQUES CHABANHDELMAS BRIDGE



BORDEAUX, FRANCE

Client: Jean Muller International Contact: Completion Date: 2013 Construction Cost: \$146 million



PROJECT HIGHLIGHTS

- Longest vertical lift bridge in Europe
- 320 ft. navigational channel
- · Increased navigational clearances (164 ft. lift height)
- · Carries four lanes of traffic and two light rail tracks
- · State of the art operating systems (energy efficient design)
- · Electrical machinery located at the base of concrete piers

KEY STAFF INVOLVEMENT:

Paul Skelton – Principal-in-Charge Peter Roody – Quality Assurance David Tuckman – Project Engineer Stephen Mikucki – Mechanical Engineer

H&H was a member of the design team for the Jacques Chaban-Delmas Lift Bridge over the Garonne River in Bordeaux, France. With its beautiful architectural form and the **longest lift span in Europe (383** ft.), the bridge is an example of the state-of-the-art in movable bridge engineering. It has a **lift height of 164** ft. and accommodates 320 ft. wide navigational channel. The bridge was designed to carry four lanes of vehicular traffic, two bicycle/pedestrian paths and two light rail tracks for a total width of approximately 140 ft.

H&H designed the bridge operating systems to raise and lower the lift span using the minimum energy possible. With only 100T difference between the weight of the deck (2,500T) and the counterweights (600T each), moving the lift span requires only two 132kW motors, located on each side of the span. The electrical machinery is housed in the base of the concrete piers that support the bridge. A robust pumping system was provided in the event of flooding.

Operation of the lift span is achieved via high-strength wire ropes passing over giant pulleys, or sheaves, which connect the lift span to the counterweights. A wire rope winch-drive operating system with an electric motor and flex vector regenerative drives hauls in and pays out the counterweights, thereby raising and lowering the lift span. Speed regulators in each tower control the motors, and sensors on the deck continuously track its position to ensure that it remains level at all times during its journey.

SARAH MILDRED LONG BRIDGE



PORTSMOUTH, NEW HAMPSHIRE TO KITTERY, MAINE

Client: Maine Dept. of Transportation Contact: Completion Date: 2014 / 2017 Construction Cost: \$159 million



PROJECT HIGHLIGHTS

- Highway/ railroad bridge replacement
- · 300 ft. single level lift span, two- level approaches
- · Post-tensioned concrete lift towers
- Operating machinery in the tower bases
- Lift span framed with steel box girders
- · State of the art vessel collision system

KEY STAFF INVOLVEMENT:

Paul Skelton – Principal-in-Charge Michael Hawkins – Project Manager Peter Roody – Movable Bridge Design Lead Steven Harlacker – Structural Engineer Raymond Mankbadi – Geotechnical Engineer Steven Mikucki – Mechanical Engineer

Hardesty & Hanover in Joint Venture is responsible for the design of the Sarah Mildred Long Bridge between Portsmouth, NH, and Kittery, Maine, which carries vehicular and railroad traffic, serving as a railway link to the Portsmouth Naval Shipyard.

The project is using **Construction Manager/General Contractor (CMGC)** delivery method. Serving as the Construction Manager, the contractor has been working with the design team on the constructability and staging issues, as well as the construction schedule and cost. This collaborative process has brought significant value to the project and minimized the up front and overall cost to the owner.

The movable bridge design, developed by H&H, features many creative and innovative solutions including the first application of precast post-tensioned concrete for the lift span towers. A single level 300-foot-long lift span, framed with box girders, has separate seating locations for the double level highway/rail approaches. The operating machinery, which was designed to reduce long term maintenance needs, is located in the tower bases. H&H also designed a state of the art vessel collision system.

> Hardesty &Hanover



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CSX NEW RIVER BRIDGE



FORT LAUDERDALE, FLORIDA

Contact: Completion Date: 2014 / 2016 Construction Cost: \$25 million

PROJECT HIGHLIGHTS

- · Replacement of movable bridge on South Florida Rail Corridor
- · Emergency repairs of severe pier settlement
- New 105 ft. rolling lift bascule span
- Improved channel alignment
- · Maintenance-friendly design
- Historic structure preserved for public display

KEY STAFF INVOLVEMENT:

Stephen Mikucki – Mechanical Engineer David Tuckman – Structural Engineer David Marcic – Structural/Seismic Engineer Raymond Mankbadi – Geotechnical Engineer

Hardesty & Hanover was responsible for the design a **new movable railroad bridge** to replace an existing Scherzer Rolling Lift over South Fork New River in Fort Lauderdale, which has been in service since 1927 serving the South Florida Rail Corridor.

Prior to the replacement design, H&H performed the **rehabilitation and emergency repairs** of the bridge. In 2000, H&H conducted an in-depth inspection; developed recommendations and estimates for immediate repairs and identified rehabilitation/replacement alternatives. In 2006 H&H developed emergency repairs for deterioration and settlement of the piers. During the installation of the crane trestle for the construction of the adjacent high level fixed bridge, the rest pier and control house structure experienced severe settlement. H&H restored the integrity of the bridge and assure uninterrupted rail operations using a temporary crutch bent system for the rest and lift piers. The design and construction of the emergency repairs was completed in 30 days.

In 2013, H&H was contracted to investigate replacement alternatives and provide final design for the replacement structure – a 105 ft. rolling lift bascule span with prestressed concrete approach spans. Design challenges included historic preservation issues and coordination of different requirements between FDOT and CSX. The project will improve the channel alignment to alleviate navigational problems. The historic structure will be preserved and relocated to a nearby park. Anticipate completion of construction – 2016.

TOMLINSON LIFT BRIDGE



Hardesty &Hanover

NEW HAVEN, CONNECTICUT

Client: Connecticut Dept. of Transportation

Contact: Completion Date: 2002

Construction Cost: \$120 million

PROJECT HIGHLIGHTS

- On-line replacement of highway & railroad bridge
- Temporary bypass structure
- 270 ft. lift span x 90 ft. wide / 75 ft. vertical clearance
- Heaviest lift span designed by H&H 3,200 tons
- 2000 ft. of track and signals work
- Recipient of many prestigious industry awards

KEY STAFF INVOLVEMENT:

Paul Skelton – Mechanical Engineer Michael Hawkins – Project Manager Steven Harlacker – Structural Engineer Stephen Mikucki – Mechanical Engineer Steven Hom – Constructability

Hardesty & Hanover led the replacement design of the Tomlinson Bridge, which provides vehicular and rail crossing over the Quinnipiac River. The existing structure, constructed in 1923, was a hazard to navigation due to a limited horizontal clearance and difficult geometry of the navigation channel. Also, the bridge was in a severe state of deterioration due to its age and fatigue from the large locomotive loads that traversed the bridge. H&H performed a comprehensive feasibility study of the bridge replacement alternatives focused on minimizing impacts on the vehicular and railroad traffic during construction. In order to prevent service disruptions, a temporary bridge was built on adjacent alignment.

The new structure is a **270-foot tower drive lift bridge** over a 240-foot-wide navigation channel with 75 ft. vertical clearance. The lift span, which is 90 ft. wide, is the **heaviest designed by H&H to date, weighing over 3,200 tons**. The span control is provided by an AC primary thyristor control system. Also included is a complete dual system of motors (100 hp) and motor controls for system redundancy.

In addition to the bridge, the project involved a replacement of 1,000 feet of roadway; **2,000 feet of track work**; **multiple rail crossings** and street intersections; roadway and rail signalization; drainage; utility relocation and street lighting.





BRIELLE BRIDGE FEASIBILITY STUDY



BRIELLE/POINT PLEASANT, NEW JERSEY

Client: New Jersey Transit Contact: Completion Date: On-Going Construction Cost: \$102 million (est.)

PROJECT HIGHLIGHTS

- Feasibility study to replace movable railroad bridge
- On-line replacement
- Navigational channel improvements
- Recommended option simple trunnion bascule
- Increased channel width from 48 to 90 ft.
- Ground improvement on the approaches

KEY STAFF INVOLVEMENT:

Paul Connolly – Project Manager Glen Schetelich – Principal-in-Charge David Gerber – Structural Engineer Raymond Mankbadi – Geotechnical Engineer Stephen Mikucki – Mechanical Engineer Peter Roody – Structural Engineer

Hardesty & Hanover is conducting a **feasibility study** and for the replacement of a 100-year old Brielle Bridge. The bridge has a total length of 1,160 ft. and it carries approximately **40 trains per day**. The objective is to replace the bridge on the same alignment, raise the profile to achieve better resiliency to the extreme weather events, and improve the navigational channel and increase design speed, while remaining within the existing ROW. Key issues include environmental impacts, permitting and approval process, and historic preservation.

H&H is conducting a comprehensive analysis of different track profiles and movable alternatives, including vertical lift; rolling-lift (same as existing); and trunnion bascule. Each profile alternative and movable option has been analyzed for environmental impacts, flood resiliency, clearances, constructability, maintenance issues, construction cost (including force account), visual impact and other pros and cons. Alternatives were ranked to provide NJT with the most efficient solution.

GF's work included survey oversight, conceptual design of alternative profiles to accomplish the track raise, relocation designs of existing Brielle Interlocking, operations analysis of construction staging, defining environmental impacts of alternative designs, permitting agencies listing, signal designs of alternative interlocking placements including modifications to protect train movements, and cost estimating.

AMTRAK/MNR NORWALK BRIDGE



Hardesty &Hanover

Client: Connecticut Dept. of Transportation

Contact: Completion Date: 2014

Construction Cost: \$465 million

PROJECT HIGHLIGHTS

- Oldest movable bridge along Northeast Corridor in CT
- Four tracks, 140 trains per day
- Feasibility study for bridge replacement
- CMGC delivery method
- Peer reviews & constructability reviews
- Replacement with two separate bascule bridges

KEY STAFF INVOLVEMENT:

Paul Skelton – Mechanical Engineer Michael Hawkins – Project Manager (Peer Review) Steven Harlacker – Project Engineer Stephen Mikucki – Mechanical Engineer

Hardesty & Hanover performed a feasibility study and is responsible for peer/constructability reviews of the design for a **\$465 million replacement** of the Norwalk River Bridge (WALK). Built in 1896, WALK is the oldest movable bridge on the Northeast Corridor (NEC) and Metro-North New Have Line. The bridge consists of a 200-foot-long, swing span and three approach truss spans for a total length of 564 feet, carrying 140 Met**ro-North and Amtrak trains per day, as well as freight traffic**. The bridge far exceeded its service life and experiences often closure failures (10% of the time), delaying the NEC traffic.

In 2000, H&H conducted a Feasibility and Economic Analysis Study to evaluate the options for the rehabilitation or replacement of the bridge. The firm's report included analysis and conceptual engineering for the rehabilitation and replacement alternatives. The project is currently in the design phase using Construction Manager/General Contractor (CMGC) method. H&H is responsible for peer reviews at each design stage and constructability reviews at 30% and 60% design stage. The reviews are focused on the constructability and serviceability of the movable span, including fabrication and shop/field erection, construction phasing, maintenance and protection of railroad operations, construction access, operational and safety concerns, and the need for temporary construction.





A-4

CONNECTICUT RIVER BRIDGE



OLD SAYBROOK, CONNECTICUT

Client: Amtrak

Contact: Completion Date: 2007 Construction Cost: \$300 million (est.)

Hardesty &Hanover

PROJECT HIGHLIGHTS

- · Feasibility study for the rail bridge replacement
- Heavily traveled 100-year old railroad bridge
- 35 passenger trains and 6 freight trains per day
- 3700 opening/closing operations annually
- Focus on operational, environmental and ROW impacts
- Historic structure preserved for public display

KEY STAFF INVOLVEMENT:

Paul Skelton – Principal-in-Charge Michael Hawkins – Deputy Project Manager Steven Hom – Project Engineer Inspection Steven Harlacker – Project Engineer Design Stephen Mikucki – Mechanical Engineer David Marcic – Structural/Seismic Engineer

Hardesty & Hanover performed in-depth inspection and feasibility study of bridge replacement alternatives for the Connecticut River Bridge on the Northeast Corridor, between Old Saybrook and Old Lyme, CT. The bridge carries approximately **35 passenger trains and 6 freight trains per weekday**. It's also operated up to 3,700 times annually to accommodate river navigation. The existing bridge, constructed circa 1907, is a two-track, open deck, electrified railroad bridge, 1,564-foot-long, consisting of seven thru-truss spans, two deck girder spans, and one 158-foot Scherzer-type rolling lift span. The marine environment has corroded the bridge's steel structure, limiting the train speeds to 45 mph.

H&H has decades of experience with the Conn River Bridge. In 1998 H&H inspected the bridge and designed replacements for the tread plates mounted to the segmental girders and track girders, as well as partial replacement of the span operating machinery and electrical controls. In the most recent assignment, H&H was responsible for a feasibility study for the bridge replacement. The study, which included an alternative to replace the movable span with high-level fixed bridge, was based on the navigational clearance requirements developed by H&H in an earlier Navigation Study for the Connecticut River. Also Included were alignment and profiles layout for various rail gradient options.

MNR HARLEM RIVER LIFT BRIDGE



NEW YORK, NEW YORK

Client: Metro-North Railroad Contact: Completion Date: 2015 Construction Cost: \$30 million



PROJECT HIGHLIGHTS

- · Parallel vertical-lift bridges carrying two rail tracks each
- 750 commuter trains per day
- Replacement of counterweight ropes
- Work platforms to facilitate construction and protect trains
- Minimized impacts to rail operations
- Focus on constructability, staging and railroad safety

KEY STAFF INVOLVEMENT:

Paul Connolly – Project Manager Peter Roody – Structural Engineer Stephen Mikucki – Mechanical Engineer Steven Hom – Constructability David Marcic – Seismic/Structural Engineer David Gerber – Structural Engineer

The Harlem River Lift Bridge is a crucial component of the Metro-North infrastructure. Build in 1955, the bridge carries **750** trains and **280,000** commuters each weekday. The bridge has parallel lift spans, each with two tracks. The spans operate independently. At either end of the bridge are steel towers that contain the machinery to hoist the spans. Hardesty & Hanover has been responsible for the design for the replacement of the main cables (counterweight ropes) that lift the two, 330-foot-long main spans of the Harlem River Lift Bridge. The project replaced **128** stranded cables each **2%** inches in diameter and **185** feet long.

Construction staging includes building temporary work platforms above the tracks to allow trains to pass underneath while the individual cables are replaced one at a time. In addition to the platform, high-strength netting has been provided between towers to deflect a fallen rope away from the adjacent span. A cable lubrication system will also be installed to forestall future deterioration. Most of the cable replacement work will be done without track outages. The key design issues included constructability, work staging to minimize impact to the railroad and assuring safety of the railroad operations during construction.

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NJ TRANSIT NEWARK DRAWBRIDGE



NEWARK, NEW JERSEY

Client: New Jersey Transit Contact: Completion Date: 2010 Construction Cost: \$25 million



PROJECT HIGHLIGHTS

- Rehabilitation of heavily traveled 110-year old railroad bridge
- Two track swing span bridge
- 60 trains per day
- Special rehabilitation details to minimize impact on operations
- · Rehabilitation to prevent further deterioration
- · Goal of extending service life by 20 years

KEY STAFF INVOLVEMENT:

Peter Roody – Structural Engineer Steven Hom – Structural Engineer David Gerber - Lead Structural Engineer Stephen Mikucki – Mechanical Engineer

Newark Drawbridge carries the NJ Transit's Morristown Line over the Passaic River between Newark and Harrison, NJ. The bridge, originally constructed in 1903, is a two-level, through truss swing span with deck truss flanking spans. It carries two tracks on its upper level. In the past there was a freight track on a lower level, but it was removed and replaced with a maintenance walkway and equipment facilities. The Morristown Line is one of the busiest commuter lines with 60 trains operating each way daily.

Hardesty & Hanover provided engineering services on a rehabilitation project which involved evaluation of the existing structure and movable span operating systems, and development of engineering alternatives to extend the service life of the bridge another by another 20 years. The final design of the selected solutions included structural repairs/strengthening, mechanical/electrical systems upgrades and timber ties replacement on the bridge and the adjacent viaducts.

The work was focused on construction staging to minimize impacts to NJT operations and to limit the amount of night-time and weekend work required. Special repair details were develop to facilitate the construction and big emphasis were placed on identifying the causes of deterioration and developing remedial approach, which would not only repair the damage, but also protect the structures from further decline and extend it service life.

SANDY SUBSTATIONS & RELATED FACILITIES



KEARNY, HOBOKEN & BAY HEAD, NEW JERSEY

Client: NJ Transit

Contact: Completion Date: 2015 (est.) Construction Cost: \$180 million

PROJECT HIGHLIGHTS

- Rail systems work for NJ Transit
- Post-Hurricane Sandy reconstruction
- · Permitting and environmental coordination
- Coordination with NJ SHPO
- · Multidisciplany engineering effort
- · Preliminary and final design

KEY STAFF INVOLVEMENT:

David Boate – Project Principal Theodory Bandy – Task Manager Ramesh Rajagopal – Environmental Manager Stephen Barkovich – Traction Power Integration Stephen Zapoticzny – Civil Engineer

GF was selected by New Jersey Transit for the design of general power substations, traction power substations, switching substations, and related facilities at the Hoboken Terminal/Yard (The 'Depot', Observer Highway, and Henderson Substations), Meadows Maintenance Complex (Building 9, Mason, and ROC Substations), and Bay Head Yard (Bay Head Substation) operating locations that were damaged as a result of Super Storm Sandy. This project will replace substation infrastructure that was damaged and incorporate resiliency features in the design to guard against future storm related events.

Additionally, GF manages and coordinates the civil, electrical, architectural, structural, geotechnical, and environmental disciplines. Gannett Fleming also manages the development of plans, reports and specifications. The work involves coordinating survey and mapping efforts, preparing a damage assessment report, designing hardening measures (trap bags, trenches and pumps), site layouts and designing site specific substations. Further, Gannett Fleming manages environmental activities that involve performing samplings and collecting data from monitoring wells at all site locations; preparing documents for NJDEP permits (including freshwater wetland, CAFRA, and Flood Hazard permits, and NJ Meadowlands Commission); and implementing soil erosion and sediment control measures.







Hardesty &Hanover

PORTAL BRIDGE CAPACITY ENHANCEMENT



NEWARK, NEW JERSEY

Client: NJ Transit Contact: Completion Date: 2014 Construction Cost: \$1 billion

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PROJECT HIGHLIGHTS

- · Major railroad bridge replacent project
- · Complex track and systems work
- Amtrak Northeast Corridor
- Included 29 bridges, and civil, track, signals, and catenary design
- · Coordination with Amtrak and NJ Transit
- Preliminary and final design

KEY STAFF INVOLVEMENT:

Richard Cross – Project Manager John Legath – Track Engineer David Howell – Deputy Project Manager Bruce Smith – Quality Assurance / Quality Control James Douglass – Scheduler Greg Nazarow – Lead Rail Operations/Simulation Analyst

Gannett Fleming is leading a joint venture to design the replacement of 2.5 miles of the Amtrak Northeast Corridor between Newark, NJ and New York City. This corridor is the most heavily travelled railroad in the country. Work involves reconfiguration of the corridor and associated interlockings carrying 472 trains/day through the environmentally sensitive Hackensack Meadowlands. The project was successfully advanced by the team through an accelerated EIS effort.

Under the Preliminary Engineering phase, the two-track railroad corridor traversing the existing bridge was expanded to five tracks and elevated to allow the existing swing bridge to be replaced by two fixed bridges above the Hackensack River. This eliminated a long-standing bottleneck along this critical corridor and minimized operations and maintenance concerns. The reconfiguration of the corridor tracks and associated interlockings was designed to allow for efficient sorting of trains.

The Preliminary Engineering included the design of 29 bridges with 124 spans and all related civil, track, signal, catenary, and electric traction substation design work. The new river crossings design consisted of two, three-span, network tied arch bridges to provide 50 foot clearance over the water. There was also a "duckunder" structure designed to enable westbound NJ Transit trains leaving New York to pass under the Amtrak Northeast Corridor.

HUDSON-BERGEN LIGHT RAIL MOS-3



BAYONNE, NEW JERSEY

Client: NJ Transit Contact: Completion Date: 2011 Construction Cost: \$60 million

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PROJECT HIGHLIGHTS

- Bridges and retaining wall design
- Extensive civil/site engineering and stormwater design
- Track, signal, communications and traction powers systems
- Geotechnical engineering
- Utilities design
- Accelerated bridge construction methods

KEY STAFF INVOLVEMENT:

David Boaté – Quality Assurance Terry Shantz – Lead Catenary Engineer Agnieszka Lapinski – Structural Engineer

GF served as the general design engineering consultant and architect/engineer of record for the extension of the Hudson-Bergen Light Rail system from the current 22nd Street terminal to a new 8th Street station located to extend transit service to existing residential areas in the South Bayonne area. GF work included for architectural, building systems, civil, site, structural, geotechnical and structural engineering design; track, signal, communications, traction power and overhead catenary system support infrastructure engineering design; and construction support services.

The project included the design of a 21-span viaduct, a two-story station building, and a 0.3 mile long post-and-panel retaining wall for embankment track sections. Train system design elements included track plinths, traction power/electrification conduit systems, corrosion control, stray current control, over-head catenary system foundations and viaduct mounting details, and communication systems. Civil/site engineering efforts included station plaza and platform design in compliance with ADA, kiss-n-ride lot design, utilities engineering, landscaping design, and signalized intersection engineering. Maintenance and protection of Bayonne city street traffic flows were critical and were accommodated through detailed, staged construction plan development.







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POSITIVE TRAIN CONTROL



SYSTEMWIDE, NEW JERSEY/NEW YORK

Client: NJ Transit Contact: Completion Date: 2013 Construction Cost: \$1 million

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PROJECT HIGHLIGHTS

- Engineering and construction assistance services
- Improved systemwide functionality and safety
- Compliance with FRA Regulations
- Plan development and implementation
- Operations and maintenance support
- · System to be implemented on Raritan

KEY STAFF INVOLVEMENT:

Joseph Bonaduce – Project Manager Dan Mitten – Radio Communications

In January 2010 the Federal Railroad Administration (FRA) issued a final ruling on the regulations for implementing the Rail Safety Improvement Act of 2008. The Act defines the criteria for certain passenger and freight rail lines requiring the implementation of Positive Train Control (PTC) systems. This final rule includes required functionalities of PTC system technology and the means by which PTC systems will be certified.

Gannett Fleming is responsible for providing engineering and construction assistance services for the implementation of Advanced Speed Enforcement System (ASES) on NJT's commuter rail network. Tasks involve providing direction on the functionality of the system for adherence to FRA regulations and working with the contractor to develop and test subsystem modifications for improved reliability and performance without compromising safety.

GF is providing support services on the development and preparation of specifications for the implementation of a PTC System. Tasks include development of a PTCIP and PTC Development Plan; prototype PTC development; installation and testing of system equipment; development of a PTC Safety Plan; wayside, on-board and office implementation; and ongoing support for operation and maintenance of the PTC System once completed.

ROUTE 35 BRIDGE OVER RARITAN RIVER



PERTH AMBOY, NEW JERSEY

Client: New Jersey Dept. of Transportation Contact: Completion Date: 2018 (est.) Construction Cost: \$1.5 billion

ALDRICH

PROJECT HIGHLIGHTS

- 4,000 ft. bridge replacement project
- · Fast tracked design schedule
- Next bridge upstream to NJ Transit Raritan River Bridge
- · High capacity driven pile and drilled shaft foundations
- Ground improvement techniques address difficult soil conditions
- Protection of existing active bridge during construction

KEY STAFF INVOLVEMENT:

Ed Zamiskie – Geotechnical Project Manager Joe Griffin – Constructability (Griffin Engineering)

Haley & Aldrich was the geotechnical engineer of record for the replacement of the Victory Bridge between Perth Amboy and Sayreville. After a terminated design-build contact, the NJDOT needed to regain significant time and a compressed design schedule was executed. The 1920 bridge was a swing bridge spanning the Raritan River between Perth Amboy and Sayreville.

The new bridge is of a high-level precast segmental concrete structure. The site contained highly variable geologic conditions including thick organic silt deposits below the river and marsh areas, loose saturated alluvium, and dense silty and clayey glacial soils. Very hard diabase bedrock was found at 80- to 110-ft below grade or river level. The mixed geologic conditions and constructability issues required the evaluation and use of varying deep foundation types and ground improvement methods: 24 in. dia pipe piles were chosen for the land piers and 6 and 8-ft dia drilled shafts were chosen for the water piers, and the soft deposits in the river required the shafts (up to 120 ft long) to be socketed into diabase bedrock to resist large lateral loads due to seismic events and vessel impact.

A combination of ground improvement techniques were designed to address compressible and liquefaction susceptible soils at the bridge approaches which required embankment fills up to 30 ft above the existing grades. Preloading/surcharging and wick drains were designed to stabilize the compressible soils. In addition, a geosynthetic-supported embankment above vibro concrete columns was designed to mitigate an area of loose saturated sands.





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PROJECT LOCATION MAP







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Project Areas of Concern (AOC)

GSP Interchange 125 Project

Regional Redevelopment Destination





KEY ISSUES





APPROACH SPAN DESIGN

Key Issues:

- Structure type
- Pier layout
- Flood resilience
- Deck type
- Constructability
- Access issues
- Durability

AESTHETIC CONSIDERATIONS

Key Issues:

- Context sensitivity
- SHPO consultation
- Public acceptance
- Maintenance
- Visual character

MAINTAINING RAIL **OPERATIONS**

Key Issues:

- Construction staging
- Equipment clearances
- Track/systems tie-ins
- Movement monitoring
- Operations analysis











- ✓ SPAN DRIVE efficient skew control and ease of maintenance
- ✓ ROPE DRIVE SYSTEM dependable, durable and maintainable
- ✓ SHEAVE DESIGN proven and durable detailing
- ✓ AUXILIARY COUNTERWEIGHT dependable span balance

MOVABLE SPAN OPERATIONS

Key Issues:

- Reliability
- Dependability
- Efficiency
- Longevity
- Maintenance

SUPPORT OF HIGH **TENSION POWER LINES**

Key Issues:

- Staging
- Clearances
- Efficiency
- Access
- Maintenance



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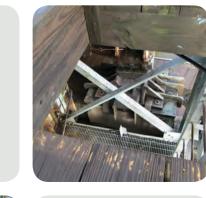


MONOPOLES

OUTRIGGERS

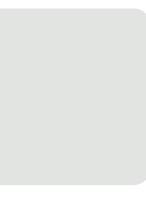






















Hardesty & Hanover/Gannett Fleming Joint Venture 1037 Raymond Blvd #1420 Newark, NJ 07102





SEPTEMBER 21, 2015

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COST PROPOSAL - VOLUME A



(RFP) No. 15-044 Design, Engineering and Construction Assistance Services for the Replacement of the



NJ TRANSIT RFP No. 15-044

Design, Engineering and Construction Assistance Services for the Replacement of Raritan River Bridge

COST & FEE RECAP - TEAM (RFP ATTACHMENT F-1)

			COST AND FE	E RECAP - TEA	M				
FIRM	MAN HOURS	SALARY	OVERHEAD RATE	OVERHEAD	SUBTOTAL	FIXED FEE @ 10%	DIRECT EXPENSES	TOTAL COST	DBE PERCENTAGE
HARDESTY & HANOVER (JV)	16,693	\$1,029,688	157.40%	\$1,620,729	\$2,650,417	\$265,042	\$1,139,694 *	\$4,055,152	
GANNETT FLEMING (JV)	13,377	\$835,790	159.17%	\$1,330,327	\$2,166,117	\$216,612	\$1,139,694 *	\$3,522,422	
HALEY & ALDRICH	3,824	\$162,404	220.94%	\$358,815	\$521,218	\$52,122	\$31,755	\$605,095	
GRIFFIN	100	\$9,000	152.30%	\$13,707	\$22,707	\$2,271	\$220	\$25,198	
NAIK (DBE)	4,404	\$170,238	127.09%	\$216,356	\$386,594	\$38,659	\$192,480	\$617,733	6.6%
ENVISION (DBE)	2,336	\$122,079	137.51%	\$167,871	\$289,950	\$28,995	\$17,280	\$336,225	3.6%
JCMS (DBE)	1,014	\$58,429	117.32%	\$68,549	\$126,978	\$12,698	\$760	\$140,436	1.5%
RADIN (DBE)	281	\$10,737	155.17%	\$16,661	\$27,398	\$2,740	\$220	\$30,357	0.3%
SJH (DBE)	312	\$17,880	140.00%	\$25,032	\$42,911	\$4,291	\$220	\$47,422	0.5%
PROJECT TOTAL	42,341	\$2,416,245		\$3,818,045	\$6,234,290	\$623,429	\$2,522,322	\$9,380,041	12.5%
DBE VENDORS									_
JERSEY BORINGS					1		1	¢1.095.150	71.00/
ESTEBAN								\$1,985,150	21.2%
							TOTAL DBE %	\$24,500	0.3%

NJ TRANSIT RFP No. 15-044

Design, Engineering and Construction Assistance Services for the Replacement of Raritan River Bridge

COST & FEE RECAP BY FIRM/TASK (RFP ATTACHMENT F-2)

11 - 10 - 1	PROJECT TOTAL BY TASK		NNETT FLEN	ING JOINT	ENTURE TE	AM	
TASK	DESCRIPTION	HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL COST
TASK 1	PROJECT MANAGEMENT	6,395		\$738,206	\$1,215,610	\$121,561	\$1,337,171
1.01		2,596	\$252,395	\$399,428	\$651,823	\$65,182	\$717,005
1.02		7	\$682	\$1,085	\$1.767	\$177	\$1.944
1.03		697	\$35,139	\$55,931	\$91,071	\$9,107	\$100,178
1.05		1,371 203	\$57,622 \$17,671	\$79,254 \$27,874	\$136,876 \$45,544	\$13,688 \$4,554	\$150,563 \$50,099
1.06		220	\$16,518	\$26,062	\$42,580	\$4,258	\$46,838
1.07	Quality Management Plan (QMP)	80	\$7,147	\$11,249	\$18,396	\$1,840	\$20,236
1.08	OMP Requirements	40	\$3,573	\$5,625	\$9,198	\$920	\$10,118
1.09		81	\$7,229	\$11,379	\$18,608	\$1,861	\$20,469
1.10		241	\$13,975	\$19,810	\$33,784	\$3,378	\$37,163
1.11		48	\$3,471	\$5,464	\$8,935	\$894	\$9,829
1.12		361	\$13,750 \$30,365	\$18,908 \$48,015	\$32,658 \$78,380	\$3,266	\$35,923
1.14		200	\$17,867	\$28,123	\$45,990	\$7,838 \$4,599	\$86,218 \$50,589
TASK 2	RISK MANAGEMENT	622	\$60,514	\$95,948	\$156,462	\$15,646	\$172,108
	Risk Identification	88	\$8,585	\$13,616	\$22,201	\$2,220	\$24,421
	Preliminary Workshop	66	\$8,353	\$13,351	\$21,704	\$2,170	\$23,874
_	Draft Risk Register	122	\$11,906	\$18,831	\$30,737	\$3,074	\$33,811
	Risk Management Workshop	92	\$8,787	\$14,041	\$22,828	\$2,283	\$25,111
-	Risk Register Risk Management Plan	92	\$8,965	\$14,203	\$23,159	\$2,317	\$25,486
TASK 3	SYSTEM SECURITY & EMERGENCY MGMT	142	\$13,917	\$21,906	\$35,823	\$3,582	\$39,405
		006	\$54,932	\$87,436	\$142,368	\$14,237	\$156,605
	ONCEPTUAL & PRELIMINARY DESIGN		-				
	CONCEPTUAL DESIGN			10000000	(states		
TASK 4.1	Data Collection & Design Criteria	400	\$24,531	\$38,863	\$63,394	\$6,339	\$69,733
TASK 4.2	Survey & Base Mapping	874	\$34,714	\$47,151	\$81,865	\$8,187	\$90,052
TASK 4.3	Right-of-Way Search	312	\$13,188	\$16,988	\$30,176	\$3,018	\$33,194
TASK 4.4 TASK 4.5	Utility Investigation	382	\$17,106	\$22,444	\$39,550	\$3,955	\$43,505
TASK 4.5	Initial Geotechnical Investigation Navigation Study	512 300	\$27,299	\$46,114	\$73,412	\$7,341	\$80,754
ASK 4.8	Conceptual Design	5,519	\$22,130 \$326,433	\$34,832 \$498,630	\$56,962 \$825,063	\$5,696	\$62,658
1	Alignment Alternatives	723	\$45,049	\$71,704	\$116,753	\$82,506 \$11,675	\$907,569 \$128,429
2		2,514	\$147,861	\$228,635	\$376,497	\$37,650	\$414,146
	Movable Span	1,000	\$69,507	\$109,404	\$178,912	\$17,891	\$196,803
	Approach Spans	1,514	\$78,354	\$119,231	\$197,585	\$19,759	\$217,344
3		340	\$18,084	\$28,785	\$46,869	\$4,687	\$51,556
4	Traction Power/Electrical	652	\$36,600	\$58,256	\$94,855	\$9,486	\$104,341
5		374	\$25,622	\$40,078	\$65,700	\$6,570	\$72,270
6	Construction Cost Construction Schedule	612	\$34,683	\$46,574	\$81,257	\$8,126	\$89,383
TASK 4.9	Feasibility Report	304	\$18,534 \$25,586	\$24,597	\$43,131	\$4,313	\$47,444
TASK 4.10	Value Engineering	933	\$64,366	\$40,477 \$93,214	\$66,063	\$6,605 \$15,758	\$72,669 \$173,338
TASK 4.11	NEPA Consultant Coordination	404	\$29,359	\$46,446	\$75,805	\$7,581	\$83,386
10 C	TOTAL PHASE IA	10,040	\$584,713	\$885,159	\$1,469,871	\$146,987	
HASE IB - I	PRELIMINARY DESIGN	10,040	490-61110	3000,108	#1,408,071	\$140,367	\$1,616,859
ASK 4.12	Preliminary Design	12,114	\$671,095	\$1,055,606	\$1,726,701	\$172,670	64 000 774
4.12.A	Update Design Criteria	100	\$7,632	\$12,073	\$19,706	\$1/2,6/0	\$1,899,371 \$21,676
4.12.B	Bridge Design	5,745	\$313,024	\$493,433	\$806,458	\$80,646	\$887,104
_	Movable Span - Structural	1,919	\$113,012	\$177,881	\$290,892	\$29,089	\$319,982
	Movable Span - Electrical					\$10,545	\$115,999
		885	\$40,969	\$64,485	\$105,454		
	Movable Span - Mechanical	885	\$43,228	\$68,041	\$111,269	\$11,127	\$122,396
	Movable Span - Mechanical Approach Spans	885 2.056	\$43,228 \$115,816	\$68,041 \$183,027	\$111,269 \$298,842	\$11,127 \$29,884	\$328,726
4.12.C	Movable Span - Mechanical Approach Spans Track Design	885 2,056 395	\$43,228 \$115,816 \$26,470	\$68,041 \$183,027 \$42,132	\$111,269 \$298,842 \$68,601	\$11,127 \$29,884 \$6,860	\$328,726 \$75,461
4.12.D	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design	885 2.056 395 1,590	\$43,228 \$115,816 \$26,470 \$79,796	\$68,041 \$183,027 \$42,132 \$133,104	\$111,269 \$298,842 \$68,601 \$212,901	\$11,127 \$29,884 \$6,860 \$21,290	\$328,726 \$75,461 \$234,191
4.12.D 4.12.E	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities	885 2,056 395 1,590 196	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799	\$328,726 \$75,461 \$234,191 \$30,786
4.12.D	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls	885 2.056 395 1,590 196 2.186	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738
4.12.D 4.12.E	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities	885 2.056 395 1,590 196 2.186 626	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267
4.12.D 4.12.E	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power	885 2.056 395 1,590 196 2.186	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471
4.12.D 4.12.E 4.12.F 4.12.F	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems	885 2.056 395 1.590 196 2.186 626 1.560	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883	\$11,127 \$29,884 \$5,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,588	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267
4.12.D 4.12.E 4.12.F 4.12.F 4.12.G 4.12.G	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$0 \$12,790 \$63,164	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0	\$11,127 \$29,884 \$6,860 \$21,290 \$30,249 \$9,661 \$20,588 \$0	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908
4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.G 4.12.H	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650 1,144	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684 \$68,759	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886	\$11,127 \$29,884 \$6,860 \$21,290 \$30,249 \$9,661 \$20,588 \$0 \$2,083 \$10,285 \$16,489	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$226,471 \$22,908 \$113,132 \$181,374
4.12.D 4.12.E 4.12.F 4.12.F 4.12.G 4.12.H 4.12.I 4.12.I ASK 4.13	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650 1,144 484	\$43.228 \$115.816 \$26.470 \$79.796 \$10.873 \$116.821 \$37,275 \$79.546 \$0 \$8.035 \$39.684 \$68.759 \$17,307	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,586 \$0 \$2,083 \$10,285 \$16,489 \$3,930	\$328,726 \$75,461 \$234,191 \$330,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$181,374 \$43,232
4.12.D 4.12.E 4.12.F 4.12.G 4.12.H 4.12.I 4.12.I ASK 4.13 ASK 4.14	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE)	885 2,056 395 1,590 196 2,186 626 7,560 0 108 650 1,144 484 152	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684 \$68,759 \$17,307 \$6,466	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218	\$111,269 \$298,842 \$68,601 \$212,901 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,588 \$0 \$2,083 \$10,285 \$16,489 \$3,930 \$1,468	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$181,374 \$43,232 \$181,533
4.12.D 4.12.E 4.12.F 4.12.G 4.12.G 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650 1,144 484 152 1,748	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684 \$68,759 \$17,307 \$6,466 \$69,225	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218 \$87,978	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685 \$157,203	\$11,127 \$29,884 \$6,860 \$21,290 \$30,249 \$9,661 \$20,588 \$0 \$2,083 \$10,285 \$10,285 \$16,489 \$3,930 \$1,468 \$15,720	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$181,374 \$43,232 \$16,153 \$172,923
4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.15 ASK 4.16	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation	885 2,056 395 1,590 196 2,186 626 7,560 0 108 650 1,144 484 	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684 \$68,759 \$17,307 \$6,466 \$69,225 \$399,785	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218 \$87,976 \$722,380	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685 \$14,685 \$157,203 \$1,122,166	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,588 \$0 \$2,083 \$10,285 \$16,489 \$3,930 \$1,468 \$1,468 \$15,720 \$112,217	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$181,374 \$43,232 \$181,374 \$43,232 \$16,153 \$172,923 \$1,234,382
4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.15 ASK 4.16	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650 1,144 484 152 1,748 8,680 1,500	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684 \$68,759 \$17,305 \$6,466 \$69,225 \$399,785 \$74,804	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218 \$8,218 \$87,978 \$722,380 \$115,119	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685 \$157,203 \$1,122,166 \$189,923	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,588 \$0 \$2,083 \$10,285 \$16,489 \$3,930 \$1,468 \$15,720 \$112,217 \$18,992	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$181,374 \$43,232 \$181,374 \$43,232 \$181,53 \$172,923 \$172,923 \$1,234,382 \$208,915
4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.15 ASK 4.16	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE IB	885 2,056 395 1,590 196 2,186 626 7,560 0 108 650 1,144 484 	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684 \$68,759 \$17,307 \$6,466 \$69,225 \$399,785	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218 \$87,976 \$722,380	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685 \$14,685 \$157,203 \$1,122,166	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,588 \$0 \$2,083 \$10,285 \$16,489 \$3,930 \$1,468 \$1,468 \$15,720 \$112,217	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$181,374 \$43,232 \$181,374 \$43,232 \$181,53 \$172,923 \$172,923 \$1,234,382 \$208,915
4.12.D 4.12.E 4.12.F 4.12.G 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650 1,144 484 152 1,748 8,680 1,500	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684 \$68,759 \$17,305 \$6,466 \$69,225 \$399,785 \$74,804	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218 \$8,218 \$87,978 \$722,380 \$115,119	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685 \$157,203 \$1,122,166 \$189,923	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,588 \$0 \$2,083 \$10,285 \$16,489 \$3,930 \$1,468 \$15,720 \$112,217 \$18,992	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$181,374 \$43,232 \$16,153 \$172,923
4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.15 ASK 4.16	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE IB	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650 1,144 484 152 1,748 8,680 1,500 24,678 34,718	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0,35 \$39,684 \$68,759 \$17,307 \$6,466 \$69,225 \$399,785 \$74,804 \$1,238,682 \$1,823,394	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218 \$87,978 \$722,380 \$115,119 \$2,011,297 \$2,896,466	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685 \$157,203 \$1,122,166 \$189,923 \$3,249,979 \$4,719,850	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,586 \$0 \$2,083 \$10,285 \$16,489 \$3,930 \$1,468 \$15,720 \$112,217 \$18,992 \$324,998 \$471,985	\$328,726 \$75,461 \$234,191 \$330,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$181,374 \$43,232 \$181,374 \$43,232 \$16,153 \$1,234,382 \$208,915 \$3,574,976 \$5,191,835
4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.15 ASK 4.16	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I TOTAL PHASE I	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650 1,144 484 152 1,748 8,680 1,500 24,678	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0 \$8,035 \$39,684 \$68,759 \$17,307 \$6,466 \$69,225 \$399,785 \$399,785 \$74,804 \$1,238,682	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218 \$87,978 \$722,380 \$115,119 \$2,011,297	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685 \$157,203 \$1,122,166 \$189,923 \$3,249,979	\$11,127 \$29,884 \$6,860 \$21,290 \$30,249 \$30,249 \$9,661 \$20,586 \$0 \$2,083 \$10,285 \$16,489 \$3,930 \$1,468 \$15,720 \$112,217 \$18,992 \$324,998	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$20 \$22,908 \$113,132 \$181,374 \$43,232 \$18,1374 \$43,232 \$18,153 \$172,923 \$172,923 \$172,923 \$172,924,382 \$208,915 \$3,574,976 \$5,191,835 \$6,857,719
4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.16	Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	885 2,056 395 1,590 196 2,186 626 1,560 0 108 650 1,144 484 152 1,748 8,680 1,500 24,678 34,718	\$43,228 \$115,816 \$26,470 \$79,796 \$10,873 \$116,821 \$37,275 \$79,546 \$0,35 \$39,684 \$68,759 \$17,307 \$6,466 \$69,225 \$399,785 \$74,804 \$1,238,682 \$1,823,394	\$68,041 \$183,027 \$42,132 \$133,104 \$17,114 \$185,668 \$59,331 \$126,337 \$0 \$12,790 \$63,164 \$96,127 \$21,995 \$8,218 \$87,978 \$722,380 \$115,119 \$2,011,297 \$2,896,466	\$111,269 \$298,842 \$68,601 \$212,901 \$27,987 \$302,490 \$96,607 \$205,883 \$0 \$20,825 \$102,848 \$164,886 \$39,302 \$14,685 \$157,203 \$1,122,166 \$189,923 \$3,249,979 \$4,719,850	\$11,127 \$29,884 \$6,860 \$21,290 \$2,799 \$30,249 \$9,661 \$20,586 \$0 \$2,083 \$10,285 \$16,489 \$3,930 \$1,468 \$15,720 \$112,217 \$18,992 \$324,998 \$471,985	\$328,726 \$75,461 \$234,191 \$30,786 \$332,738 \$106,267 \$226,471 \$0 \$22,908 \$113,132 \$18,1374 \$43,232 \$16,153 \$17,2923 \$1,234,382 \$208,915 \$3,574,976 \$5,191,835

FIRM: <u>Hardesty & Hanover</u>

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL COS
TASK 1	PROJECT MANAGEMENT	2,435	\$217,735	\$342,715	\$560,450	\$56,045	\$616,49
1.0		1,407	\$130,459	\$205,342	\$335,801	\$33,580	\$369,38
1.0		0	\$0	\$0	\$0	\$0	\$
1.0		0	\$0 \$0	\$0. \$0	\$0	\$0	5
1.0		160	\$14,294	\$22,498	\$36,792	\$0 \$3,679	\$40,47
1.0		180	\$13,017	\$20,489	\$33,507	\$3,351	\$36.85
1.0	7 Quality Management Plan (QMP)	80	\$7,147	\$11,249	\$18,396	\$1,840	\$20,23
1.0		40	\$3,573	\$5,625	\$9,198	\$920	\$10,11
1.0		80	\$7,147	\$11,249	\$18,396	\$1,840	\$20,23
1.1		40	\$2,893	\$4,553	\$7,446	\$745	\$8,19
1.1		48	\$3,471	\$5,464	\$8,935	\$894	\$9,82
1.1		0	\$0	\$0	\$0	\$0	\$
1,10		200	\$17,867	\$28,123 \$28,123	\$45,990	\$4,599	\$50,58
TASK 2	RISK MANAGEMENT	592	\$58,021	\$91,325	\$45,990 \$149,346	\$4,599	\$50,58
TTIOLE A	Risk Identification	60	\$7,841	\$12,341	\$20,182	\$14,935 \$2,018	\$164,28
	Preliminary Workshop	80	\$7,841	\$12,341	\$20,182	\$2,018	\$22,20
· .	Draft Risk Register	120	\$11,761	\$18,512	\$30,273	\$3,027	\$33,30
	Risk Management Workshop	80	\$7,841	\$12,341	\$20,182	\$2,018	\$22.20
	Risk Register	90	\$8,821	\$13,684	\$22,705	\$2,270	\$24,97
	Risk Management Plan	142	\$13,917	\$21,906	\$35.823	\$3,582	\$39,40
TASK 3	SYSTEM SECURITY & EMERGENCY MGMT	0	\$01	\$0	\$0	\$0	
PHASE I - C	CONCEPTUAL & PRELIMINARY DESIGN						
PHASE IA -	CONCEPTUAL DESIGN						
TASK 4.1		100					
TASK 4.1	Data Collection & Design Criteria Survey & Base Mapping	180	\$10,356	\$16,300	\$26,656	\$2,666	\$29,32
TASK 4.3	Right-of-Way Search	0	\$0	\$0	\$0	\$0	50
TASK 4.4	Utility Investigation	0	\$0	\$0	\$0	\$0 \$0	\$1 \$1
TASK 4.5	Initial Geotechnical Investigation	400	\$21,659	\$34,092	\$55,751	\$5,575	\$61,32
TASK 4.7	Navigation Study	300	\$22,130	\$34,832	\$56,962	\$5,696	\$62,650
TASK 4.8	Conceptual Design	1,841	\$120,631	\$189,874	\$310.505	\$31,051	\$341,556
1	Alignment Alternatives	0	\$0	\$0	\$0	\$0	\$0.4.1,050
		1,613	\$105,942	\$166,752	\$272,694	\$27,269	\$299,963
	Movable Span	1,000	\$69,507	\$109,404	\$178,912	\$17,891	\$196,803
	Approach Spans	613	\$36,435	\$57,348	\$93,782	\$9,378	\$103,161
3		0	\$0	\$0	\$0	\$0	\$0
		0	\$0	\$0	\$0	\$0	\$0
		60 116	\$4,823 \$5,875	\$7,592	\$12,415	\$1,242	\$13,657
7	Construction Schedule	52	\$3,875	\$9,246 \$6,283	\$15,121 \$10,275	\$1,512	\$16,633
TASK 4.9	Feasibility Report	100	\$6,090	\$9,586	\$15,676	\$1,028	\$11.303
FASK 4.10	Value Engineering	160	\$10,905	\$17,165	\$28,070	\$2,807	\$30,877
TASK 4.11	NEPA Consultant Coordination	200	\$16,112	\$25,361	\$41,474	\$4,147	\$45,621
	TOTAL PHASE IA	3,181	\$207,684	\$327,209	\$535,094	\$53,509	\$588,603
	PRELIMINARY DESIGN	3,101	\$Z01,004	\$321,208	\$030,094]	203.008	
the second se							4000,000
FASK 4.12				1			4000,000
	Preliminary Design	4,725	\$262,140	\$412,609	\$674,749	\$67,475	\$742,224
4,12.A	Preliminary Design Update Design Criteria	50	\$4,241	\$6,675	\$10,916	\$1,092	\$742,224 \$12,008
	Preliminary Design Update Design Criteria Bridge Design	50 3,991	\$4,241 \$216,146	\$6,675 \$340,214	\$10,916 \$556,360	\$1,092 \$55,636	\$742,224 \$12,008 \$611,996
4,12.A	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural	50 3,991 1,919	\$4,241 \$216,146 \$113,012	\$6,675 \$340,214 \$177,881	\$10,916 \$556,360 \$290,892	\$1,092 \$55,636 \$29,089	\$742,224 \$12,008 \$611,996 \$319,982
4,12.A	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical	50 3,991 1,919 885	\$4,241 \$216,146 \$113,012 \$40,969	\$6,675 \$340,214 \$177,881 \$64,485	\$10,916 \$556,360 \$290,892 \$105,454	\$1,092 \$55,636 \$29,089 \$10,545	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999
4,12.A	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical	50 3,991 1,919 885 685	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041	\$10,916 \$556,360 \$290,892 \$105,454 \$111,269	\$1,092 \$55,636 \$29,089 \$10,545 \$11,127	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396
4,12.A	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans	50 3,991 1,919 885 685 302	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807	\$10,916 \$556,360 \$290,892 \$105,454 \$111,269 \$48,745	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619
4.12.A 4.12.B	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design	50 3,991 1,919 885 685 302 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$48.745 \$0	\$1,092 \$55,636 \$29,089 \$10,545 \$11,127 \$4,874 \$0	\$742,224 \$12,008 \$611,096 \$319,982 \$115,999 \$122,396 \$53,619 \$0
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D 4.12.E	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans	50 3,991 1,919 885 685 302	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807	\$10,916 \$556,360 \$290,892 \$105,454 \$111,269 \$48,745 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$0 \$53,619 \$0
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls	50 3.991 1,919 885 885 302 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$0	\$6,675 \$340,214 \$777,881 \$64,485 \$68,041 \$29,807 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$48.745 \$0	\$1,092 \$55,636 \$29,089 \$10,545 \$11,127 \$4,874 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$0 \$0 \$0 \$0 \$00
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D 4.12.E	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power	50 3.991 1,919 885 885 302 0 0 196 0 0	\$4.241 \$216.146 \$113.012 \$40.969 \$43.228 \$18.937 \$00 \$00 \$10.873 \$00 \$00 \$00 \$00 \$00	\$6.675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$0 \$17,114	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$40.745 \$0 \$0 \$0 \$27.987	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$0 \$2.799	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$0 \$30,786 \$30,786 \$30,786 \$30,786
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D 4.12.E	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls	50 3.991 1,919 885 865 302 0) 0 196 0 0 0 0 0	\$4.241 \$216.146 \$113.012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$10,873 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$17,114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$48,745 \$0 \$0 \$27.987 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55,636 \$29,099 \$10,545 \$11,127 \$4,874 \$0 \$0 \$2,799 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$0 \$30,786 \$30,786 \$30,786 \$30,786 \$30,786
4.12.A 4.12.B 4.12 C 4.12 C 4.12 D 4.12 E 4.12.F	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls	50 3.991 1,919 885 685 302 0 0 0 196 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$10,873 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$17,114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$48.745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$2.799 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$00 \$30,786 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0
4.12.A 4.12.B 4.12.C 4.12.C 4.12.C 4.12.E 4.12.F 4.12.F	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems	50 3.991 1,919 885 685 302 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$10,873 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6.675 \$340.214 \$177,881 \$64.485 \$68.041 \$29,807 \$0 \$0 \$17,114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$40.745 \$0 \$0 \$27.967 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11,127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$00 \$30,786 \$30,786 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications	50 3.991 1,919 885 685 302 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4.241 \$216.146 \$113.012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$10.873 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6.675 \$340.214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$48.745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11,127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$175,999 \$122,396 \$53,619 \$0 \$30,786 \$30,786 \$30,786 \$30,786 \$30,786 \$30,786 \$30,800 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00
4.12.A 4.12.B 4.12.C 4.12.D 4.12.C 4.12.E 4.12.F 4.12.F 4.12.G 4.12.H 4.12.I	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Appraach Spans Track Design Préliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule	50 3.991 1,919 885 885 302 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111,269 \$48,745 \$0 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$2,799 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,956 \$379,982 \$175,999 \$122,396 \$53,619 \$00 \$00 \$30,786 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0
4.12.A 4.12.B 4.12.C 4.12.D 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.I ASK 4.13	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Apprach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Cormunications Cost & Schedule Supplemental Survey	50 3.991 1,919 885 685 302 0 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$17,114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$256.360 \$290.892 \$105.454 \$111.269 \$48.745 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,936 \$319,982 \$175,999 \$122,396 \$53,679 \$00 \$30,786 \$30,786 \$30,786 \$30,786 \$30,786 \$30,786 \$30,800 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.E 4.12.F 4.12.F 4.12.F 4.12.H 4.12.I ASK 4.13 ASK 4.14	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electincal Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE)	50 3.991 1,919 885 885 302 0 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6.675 \$340.214 \$177,881 \$64.485 \$68.047 \$29,807 \$0 \$0 \$17.114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$48.745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0
4.12.A 4.12.B 4.12.C 4.12.D 4.12.F 4.12.F 4.12.F 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.S 4.12.C 4.	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation	50 3.991 1,919 885 685 302 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$10,873 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6.675 \$340.214 \$177,881 \$64.485 \$68.041 \$29,807 \$0 \$0 \$17,114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$40.745 \$0 \$0 \$27.967 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11,127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$00 \$30,786 \$30,786 \$30,786 \$30,786 \$30,786 \$30,800 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00
4.12.A 4.12.B 4.12.C 4.12.D 4.12.C 4.12.E 4.12.F 4.12.F 4.12.G 4.12.H 4.12.I	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Controls Signal Systems Controls Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation	50 3.991 1,979 885 885 302 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$48,745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$15,999 \$122,396 \$53,619 \$00 \$30,786 \$30,786 \$00 \$00 \$30,800 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.15	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	50 3.991 1,978 885 885 302 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$40.745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11,127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,952 \$319,982 \$115,999 \$122,396 \$53,619 \$53,619 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.15	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Appraach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	50 3.991 1,919 885 685 302 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$48,745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$00 \$30,786 \$30,786 \$30,786 \$30,786 \$30,786 \$30,800 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.15	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	50 3.991 1,978 885 885 302 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$40.745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11,127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,336 \$53,619 \$00 \$30,765 \$00 \$30,765 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.15	Preliminary Design Update Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Appraach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	50 3.991 1,919 885 885 302 0 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6,675 \$340,214 \$177,887 \$64,485 \$68,047 \$29,807 \$0 \$0 \$17,114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111,269 \$40,745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$175,999 \$122,396 \$53,619 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.15	Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Structural Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Contruncications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I TOTAL PHASE I	50 3.991 1,919 885 685 302 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$10,873 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6,675 \$340,214 \$177,881 \$64,485 \$68,041 \$29,807 \$0 \$0 \$17,114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111.269 \$40.745 \$0 \$0 \$27.967 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11,127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,008 \$611,996 \$319,982 \$115,999 \$122,396 \$53,619 \$00 \$30,785 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0
4.12.A 4.12.B 4.12.C 4.12.D 4.12.L 4.12.L 4.12.F 4.12.H 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.15	Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	50 3.991 1,919 885 885 302 0 0 0 196 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$4,241 \$216,146 \$113,012 \$40,969 \$43,228 \$18,937 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6,675 \$340,214 \$177,887 \$64,485 \$68,047 \$29,807 \$0 \$0 \$17,114 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$10.916 \$556.360 \$290.892 \$105.454 \$111,269 \$40,745 \$0 \$0 \$27.987 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$1.092 \$55.636 \$29.089 \$10.545 \$11.127 \$4.874 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$742,224 \$12,005 \$611,995 \$319,985 \$112,396 \$53,619 \$53,619 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$00 \$0

FIRM: Gannett Fleming

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL CO
TAŠK 1	PROJECT MANAGEMENT	2,140	\$177,379	\$282,334	\$459,713	\$45,971	\$505,6
1.01		1,189	\$121,936	\$194.086	\$316,022	\$31,602	\$347,6
1.02		7	\$682	\$1,085	\$1,767	\$177	\$1,9
1.04		697	\$35,139	\$55,931	\$91,071	\$9,107	\$100,1
1.05		43	\$82 \$3,377	\$130	\$212	\$21	\$2
1.00		40	\$3,377 \$3,501	\$5,375 \$5,572	\$8,752	\$875	\$9,6
1.07		0	\$0,501 \$0	30,072 \$0	\$9,073 \$0	\$907 \$0	\$9,9
1.08		0	\$0		\$0	\$U \$0	
1.09		1	\$82	\$130	\$212		\$2
1.10		i	\$82	\$130	\$212	\$21	\$2
1.11		0	\$0	\$0	\$0	50	
1.12		0	\$0	\$0	50	50	
1.13	Project Meetings	161	\$12,498	\$19,893	\$32,391	\$3,239	\$35,6
1.14	Payment Procedures	- 0	\$0	\$0	\$0	\$0	
ASK 2	RISK MANAGEMENT	16	\$1,434	\$2,282	\$3,715	\$372	\$4,0
	Risk Identification	6	\$600	\$955	\$1,555	\$156	\$1,7
	Preliminary Workshop	2	\$200]	\$318	\$518	\$52	\$5
	Oraft Risk Register	0	50	\$0	\$0	\$0	
	Risk Management Workshop	8	\$634	\$1,009	\$1,642	\$164	\$1,8
	Risk Register	0	\$0	\$0	\$0	\$0	
A 444 4	Risk Management Plan	0	\$0	\$0	\$0	\$0	
ASK 3	SYSTEM SECURITY & EMERGENCY MGMT	606	\$54,932	\$87,436	\$142,368	\$14,237	\$156,6
HASE I - C	CONCEPTUAL & PRELIMINARY DESIGN						
HASE IA -	CONCEPTUAL DESIGN			10. Y			and the
ASK 4.1	Data Collection & Design Criteria	220	\$14,175	\$22,563	838 30¢	89.094	
ASK 4.2	Survey & Base Mapping	168	\$9,454	\$22,563	\$36,738 \$24,503	\$3,674	\$40,4
ASK 4.3	Right-of-Way Search	12	\$709	\$15,049	\$24,503	\$2,450	
ASK 4.4	Utility Investigation	32	\$2,194	\$1,129	\$1,836		\$2,0
ASK 4.5	Initial Geotechnical Investigation	12	\$2,194	\$1,129	\$0,665	<u>\$569</u> \$184	\$6,2
ASK 4.7	Navigation Study	0	\$0	\$0	\$1,636	\$104	\$2,0
ASK 4.8	Conceptual Design	2.582	\$145,089	\$230,939	\$376,028	\$37,603	\$413,6
1		723	\$45,049	\$71,704	\$116,753	\$11,675	\$128,4
2		485	\$24,284	\$38,652	\$62,936	\$6,294	\$120,4
	Movable Span	0	50	50	\$0	\$0,254	
	Approach Spans	485	\$24,284	\$38.652	\$62,936	\$6,294	\$69.2
3	Civil Design	340	\$18,084	\$28,785	\$46,869	\$4,687	\$51.5
4		652	\$36,600	\$58,256	\$94,855	\$9,486	\$104,3
5	Constructability	214	\$11,798	\$18,780	\$30,578	\$3,058	\$33,6
6		116	\$6,282	\$9,999	\$16,280	\$1,628	\$17,9
7	Construction Schedule	52	\$2,992	\$4,763	\$7,756	\$776	\$8,5
ASK 4.9	Feasibility Report	296	\$19,060	\$30,337	\$49,397	\$4,940	\$54,3
ASK 4.10	Value Engineering	241	\$12,653	\$20,140	\$32,794	\$3,279	\$36,0
ASK 4.11	NEPA Consultant Coordination	204	\$13,247	\$21,085	\$34,332	\$3,433	\$37,7
	TOTAL PHASE IA	3,767	\$217,291	\$345,862	\$563,152	\$56,315	\$619,4
HASE IB -	PRELIMINARY DESIGN			_			
AŠK 4.12	Preliminary Design	6,248	\$351,230	\$559,053	\$910.284	\$91,028	\$1,001,31
4.12.A	Update Design Criteria					331.028	
			C2 204	C6 300	69 7001	2070	
4.12.B		50	\$3,391 \$88,733	\$5,398 \$141,237	\$8,789	\$879	\$9,6
	Bridge Design	1,566	\$88,733	\$141,237	\$229,970	\$22,997	\$9,6 \$252,9
			\$88.733 \$0	\$141.237 \$0	\$229,970 \$0	\$22,997 \$0	\$9,6 \$252,9
	Bridge Design Movable Span - Structural	1,566 0	\$88,733 \$0 \$0	\$141,237 \$0 \$0	\$229.970 \$0 \$0	\$22,997 \$0 \$0	\$9,6 \$252,9
4 12.8	Bridge Design Movable Span - Structural Movable Span - Electrical	1,566 0 0	\$88.733 \$0	\$141,237 \$0 \$0 \$0 \$0	\$229,970 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$0	\$9,6 \$252,9
	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical	1,566 0 0	\$88,733 \$0 \$0 \$0 \$0	\$141,237 \$0 \$0 \$0 \$141,237	\$229.970 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997	\$9,6 \$252,9 \$252,9
4.12.B 4.12.C 4.12.D	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design	1,566 0 0 0 1,566	\$88.733 \$0 \$0 \$0 \$88.733	\$141,237 \$0 \$0 \$0 \$0	\$229,970 \$0 \$0 \$0 \$229,970	\$22,997 \$0 \$0 \$22,997 \$22,997 \$6,860	\$9,6 \$252,9 \$252,9 \$252,9 \$75,4
4.12.8 4.12.C 4.12.D 4.12.E	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities	1,566 0 0 1,566 395	\$88,733 \$0 \$0 \$88,733 \$88,733 \$26,470	\$141.237 \$0 \$0 \$0 \$141.237 \$42,132	\$229,970 \$0 \$0 \$229,970 \$229,970 \$68,601	\$22,997 \$0 \$0 \$0 \$22,997	\$9,6 \$252,9 \$252,9 \$75,4 \$199,3
4.12.B 4.12.C 4.12.D	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls	1,566 0 0 1,566 395 1,400 0 2,005	\$88.733 \$0 \$0 \$88,733 \$26,470 \$69,933 \$0 \$109,905	\$141,237 \$0 \$0 \$141,237 \$42,132 \$111,313	\$229,970 \$0 \$0 \$229,970 \$68,601 \$181,246	\$22,997 \$0 \$0 \$22,997 \$6,860 \$18,125	\$9,6 \$252,9 \$252,9 \$75,4 \$199,3
4.12.B 4.12.C 4.12.D 4.12.E	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power	1,566 0 0 1,566 395 1,400 0 2,005 626	\$88.733 \$0 \$0 \$60 \$88.733 \$26.470 \$69.933 \$0 \$109.905 \$37,275	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337	\$229,970 \$0 \$0 \$229,970 \$68,601 \$181,246 \$0 \$284,842 \$96,607	\$22,997 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0	\$9,6 \$252,9 \$252,9 \$75,4 \$199,3 \$199,3 \$313,3
4.12.B 4.12.C 4.12.D 4.12.E	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Tracton Power Electrical	1,566 0 0 1,566 395 1,400 0 2,005 626 1,379	\$88.733 \$0 \$0 \$0 \$88,733 \$26,470 \$69,933 \$0 \$109,905 \$37,275 \$72,630	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59,337 \$115.605	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235	\$22,997 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$18,125 \$0 \$28,484 \$9,661 \$18,824	\$9,6 \$252,9 \$252,9 \$75,4 \$199,3 \$313,3 \$106,20
4.12.B 4.12.C 4.12.D 4.12.E 4.12.F	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bindge Controls	1,566 0 0 1,566 395 1,400 0 2,005 626 1,379 0	\$88,733 \$0 \$0 \$0 \$6,733 \$26,470 \$69,933 \$0 \$109,905 \$37,275 \$72,630 \$0	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$115.605 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0	\$22,997 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,494 \$9,661 \$18,824 \$0	\$9.6 \$252,9 \$75.4 \$199.3 \$313.3 \$106.20 \$207.0
4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108	\$88,733 \$0 \$0 \$0 \$86,733 \$26,470 \$69,933 \$0 \$109,905 \$37,275 \$72,630 \$0 \$8,035	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$115.605 \$0 \$12.790	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20,825	\$22,997 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$9,661 \$18,824 \$0 \$28,484 \$9,661 \$18,824 \$0 \$2,083	\$9.6 \$252,9 \$75,4 \$199,3 \$313,3 \$106,20 \$207,00 \$22,9
4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650	\$88,733 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$115.605 \$0 \$12.790 \$63.164	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848	\$22,997 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,667 \$18,824 \$0 \$22,484 \$9,667 \$18,824 \$0 \$22,484 \$9,667 \$18,824 \$0 \$2,083 \$10,285	\$9.6 \$252.9 \$252.9 \$75.4 \$199.3 \$313.3 \$106.24 \$207.0 \$22.9 \$113.1
4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.G 4.12.H 4.12.J	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule	1,566 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74	\$88,733 \$0 \$0 \$0 \$0 \$0 \$0 \$0,733 \$26,470 \$69,933 \$00 \$109,905 \$37,275 \$72,630 \$0 \$0 \$37,275 \$72,630 \$0 \$39,684 \$39,684 \$5,078	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$115.605 \$0 \$12.790 \$63.164 \$8.083	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848 \$13.162	\$22,997 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$0 \$28,484 \$9,661 \$18,824 \$0 \$28,484 \$9,661 \$18,824 \$0 \$2,083 \$10,285 \$1,316	\$9.6 \$252.9 \$252.9 \$75.4 \$199.3 \$106.24 \$207.05 \$2207.05 \$22.9 \$113.11 \$14.4
4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.F 4.12.J 5K 4.13	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74	\$88,733 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$89,733 \$26,470 \$69,933 \$0 \$109,905 \$109,905 \$37,275 \$72,630 \$0 \$39,684 \$5,078 \$59,685 \$39,684 \$5,078 \$0	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$115.605 \$0 \$12.790 \$63.164 \$8.083 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$168,235 \$0 \$20.825 \$102.848 \$13.162 \$0	\$22,997 \$0 \$0 \$22,997 \$6.860 \$18,125 \$0 \$28,484 \$9,667 \$18,824 \$0 \$28,484 \$0,667 \$18,824 \$0 \$2,083 \$10,285 \$10,285 \$11,316 \$0	\$9.6 \$252.9 \$252.9 \$75.4 \$199.3 \$313.3 \$313.3 \$313.3 \$207.0 \$22.9 \$113.1 \$14.4 \$14.4
4.12.B 4.12.C 4.12.D 4.12.F 4.12.F 4.12.F 4.12.F 4.12.J 5K 4.13 5K 4.14	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Controls Signal Systems Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE)	1,556 0 0 1,566 3955 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$0 \$86,733 \$26,470 \$69,933 \$0 \$109,905 \$37,275 \$72,630 \$0 \$8,035 \$39,684 \$5,078 \$50 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$175.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$20.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$9,661 \$18,824 \$0 \$22,083 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$9.6 \$252.9 \$252.9 \$75.4 \$199.3 \$313.3 \$106.20 \$207.05 \$22.99 \$113.1 \$12.4 \$13.1 \$12.9 \$113.1 \$14.4 \$14.4
4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 5K 4.13 5K 4.13 5K 4.15	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation	1,566 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$175.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$0 \$28,484 \$9,661 \$18,824 \$0 \$2,083 \$10,285 \$1,316 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$9.6 \$252.9 \$252.9 \$75.4 \$199.3 \$313.3 \$106.2(\$227.0) \$22.9 \$113.1 \$14.4
4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.F 4.12.S 4.12.H 4.12.I SK 4.13 SK 4.15 SK 4.16	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Refocation	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$115.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$198.235 \$0 \$204.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,667 \$18,824 \$0 \$28,484 \$9,667 \$18,824 \$0 \$20,484 \$9,667 \$18,824 \$0 \$20,495 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$9.6 \$252,9 \$75,4 \$199,3 \$106,22 \$22,9 \$313,3 \$106,22 \$227,0 \$113,12 \$14,4 \$14,4
4.12.B 4.12.C 4.12.D 4.12.E 4.12.E 4.12.F 4.12.F 4.12.G 4.12.H 4.12.S 4.12.H 4.12.S 5K 4.13 5K 4.15 5K 4.16	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$109,905 \$37,275 \$72,630 \$0 \$37,275 \$72,630 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$115.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$0 \$28,484 \$9,661 \$18,824 \$0 \$2,083 \$10,285 \$1,316 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$9.6 \$252.9 \$75.4 \$199.3 \$106.21 \$22.9 \$313.3 \$106.21 \$227.0 \$113.1 \$14.4
4.12.B 4.12.C 4.12.D 4.12.E 4.12.E 4.12.F 4.12.F 4.12.G 4.12.H 4.12.S 4.12.H 4.12.S 5K 4.13 5K 4.15 5K 4.16	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE IB	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$115.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$198.235 \$0 \$204.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,667 \$18,824 \$0 \$28,484 \$9,667 \$18,824 \$0 \$20,484 \$9,667 \$18,824 \$0 \$20,495 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$95.5 \$252.9 \$252.9 \$75.4 \$199.3 \$313.3 \$106.2 \$207.0 \$207.0 \$227.9 \$113.1 \$14.4 \$\$\$5.5
4.12.B 4.12.C 4.12.D 4.12.E 4.12.E 4.12.F 4.12.F 4.12.G 4.12.H 4.12.S 4.12.H 4.12.S 5K 4.13 5K 4.15 5K 4.16	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0 0 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$26,470 \$69,933 \$0 \$109,905 \$37,275 \$72,630 \$0 \$39,684 \$5,078 \$0 \$0 \$0 \$0 \$0 \$33,524 \$384,754	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$175.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$53.360 \$612.413	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$0 \$28,484 \$9,661 \$18,824 \$0 \$20,835 \$10,285 \$11,316 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$12,997 \$6,860 \$0 \$12,997 \$6,860 \$0 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$0 \$2,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$0 \$2,844 \$0,661 \$12,825 \$0 \$12,997 \$6,860 \$12,997 \$0 \$2,844 \$0,661 \$12,825 \$0 \$12,997 \$6,860 \$11,125 \$0 \$12,997 \$6,860 \$12,997 \$0 \$2,844 \$0,661 \$13,822 \$0 \$10,285 \$11,316 \$0 \$2,846 \$0 \$10,285 \$1,316 \$0 \$2,846 \$0 \$10,285 \$1,316 \$0 \$2,846 \$0 \$10,285 \$1,316 \$0 \$0 \$10,285 \$1,316 \$0 \$0 \$10,285 \$1,316 \$0 \$0 \$10,285 \$1,316 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$1,316 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$9.6 \$252.9 \$75.4 \$199.3 \$106.2 \$207.0 \$22.9 \$207.0 \$22.9 \$113.1 \$14.4 \$14.4 \$14.4 \$14.4
4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.S 4.12.H 4.12.I SK 4.13 SK 4.14 SK 4.15	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0 0 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$86,733 \$26,470 \$69,933 \$0 \$109,905 \$37,275 \$72,630 \$0 \$8,035 \$39,684 \$5,078 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$2,045 \$0 \$2,045 \$0 \$2,045 \$0 \$0 \$0 \$0 \$0,055 \$0,056 \$0,055 \$0,	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$175.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$0 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$9,661 \$13,16 \$0 \$2,083 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$0 \$0 \$0 \$0 \$0 \$0 \$1,316 \$0 \$0 \$0 \$1,316 \$0 \$0 \$1,316 \$0 \$0 \$1,316 \$0 \$0 \$1,316 \$0 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316\$1,316\$1,	\$9.6 \$252.9 \$75.4 \$199.3 \$313.3 \$106.20 \$207.05 \$22.9 \$113.1 \$14.47 \$22.9 \$113.1 \$14.47 \$22.9 \$113.5 \$14.47 \$22.9 \$113.5 \$14.47 \$22.9 \$113.5 \$14.47 \$22.9 \$113.5 \$14.47 \$22.9 \$113.5 \$14.47 \$22.9 \$113.5 \$115
4.12.B 4.12.C 4.12.D 4.12.E 4.12.E 4.12.F 4.12.F 4.12.S 4.12.H 4.12.S 5K 4.13 5K 4.15 5K 4.16	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I TOTAL PHASE I	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0 0 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$0 \$26,470 \$69,933 \$0 \$109,905 \$37,275 \$72,630 \$0 \$39,684 \$5,078 \$0 \$0 \$0 \$0 \$0 \$33,524 \$384,754	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$175.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$53.360 \$612.413	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$0 \$28,484 \$9,661 \$18,824 \$0 \$20,835 \$10,285 \$11,316 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$12,997 \$6,860 \$0 \$12,997 \$6,860 \$0 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$0 \$2,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$6,860 \$12,997 \$0 \$2,844 \$0,661 \$12,825 \$0 \$12,997 \$6,860 \$12,997 \$0 \$2,844 \$0,661 \$12,825 \$0 \$12,997 \$6,860 \$11,125 \$0 \$12,997 \$6,860 \$12,997 \$0 \$2,844 \$0,661 \$10,285 \$11,316 \$20 \$10,285 \$11,316 \$20 \$10,285 \$11,316 \$20 \$10,285 \$11,316 \$20 \$10,285 \$11,316 \$20 \$10,285 \$10,28	\$9.6 \$252.9 \$75.4 \$199.3 \$106.2 \$207.0 \$22.9 \$207.0 \$22.9 \$113.1 \$14.4 \$14.4 \$14.4 \$14.4
4.12.B 4.12.C 4.12.C 4.12.E 4.12.E 4.12.F 4.12.F 4.12.S 4.12.H 4.12.S 5K 4.13 5K 4.15 5K 4.16	Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	1,556 0 0 1,566 395 1,400 0 2,005 626 1,379 0 108 650 74 0 0 0 0 0 0 0 0 0 0 0 0 0	\$88,733 \$0 \$0 \$0 \$86,733 \$26,470 \$69,933 \$0 \$109,905 \$37,275 \$72,630 \$0 \$8,035 \$39,684 \$5,078 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$2,045 \$0 \$2,045 \$0 \$2,045 \$0 \$0 \$0 \$0 \$0,055 \$0,056 \$0,055 \$0,	\$141.237 \$0 \$0 \$141.237 \$42.132 \$111.313 \$0 \$174.936 \$59.337 \$175.605 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$12.790 \$63.164 \$8.083 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$229.970 \$0 \$0 \$229.970 \$68.601 \$181.246 \$0 \$284.842 \$96.607 \$188.235 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$0 \$0 \$20.825 \$102.848 \$13.162 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$22,997 \$0 \$0 \$0 \$22,997 \$6,860 \$18,125 \$0 \$28,484 \$9,661 \$18,824 \$9,661 \$13,16 \$0 \$2,083 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$10,285 \$0 \$0 \$0 \$0 \$0 \$0 \$1,316 \$0 \$0 \$0 \$1,316 \$0 \$0 \$1,316 \$0 \$0 \$1,316 \$0 \$0 \$1,316 \$0 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316 \$0 \$1,316\$1,316\$1,	\$9.6 \$252.9 \$75.4 \$199.3 \$313.3 \$106.2 \$207.0 \$229.9 \$113.1 \$14.4 \$95.5 \$1,096.8 \$1,096.8

FIRM: Haley & Aldrich

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL COST
TASK 1	PROJECT MANAGEMENT	0	\$0	\$0	\$0	\$0	\$
1.01		Ó	\$0	\$0	- \$0	\$0	\$
1.02		0	\$0	4-	\$0	\$0	\$
1.03		0	\$0		\$0	SŐ	\$
1.04		0	<u>\$0</u> \$0	\$0 \$0	\$0	\$0	\$
1.05	Quality Control	0		<u> </u>	\$0 \$0	<u> </u>	<u></u>
1.07		0	\$0		\$0	\$0 \$0	
1.08		0	50	\$0	50	\$0	\$
1.09		0	\$0	\$0	\$0	\$0	5
1.10		0	\$0	\$0	- \$0	\$0	- 50
1.11		0	\$0	\$0	\$0	\$0	Ş
1.12		0	\$0	\$0	\$0	\$0	SI
1.13		- <u>C</u>	50		\$0	\$0	S(
TASK 2	Payment Procedures	0	\$0	\$0	\$0	\$0	\$4
INON Z	Risk Identification	14	\$1,060	\$2,341	\$3,400	\$340	\$3,74
	Preliminary Workshop	4	\$145 \$313	\$320 \$691	\$464 \$1.004	\$46 \$100	\$511
	Draft Risk Register	2	\$313 \$145	\$320	51,004 \$464	\$100	\$1,10
	Risk Management Workshop	4	\$313	\$691	\$1,004	\$100	<u>\$511</u> \$1,104
	Risk Register	2	\$145	\$320	\$464	\$46	\$1,10
	Risk Management Plan	Ō	\$0	\$320	50	50	
TASK 3	SYSTEM SECURITY & EMERGENCY MGMT	0	\$0	\$0	\$0	\$0	
	ONCEPTUAL & PRELIMINARY DESIGN			Ţ.			
	CONCEPTUAL DESIGN				2		
TASK 4.1	Data Collection & Design Criteria	0	\$0	\$0	\$0	\$0	\$0
TASK 4.2	Survey & Base Mapping	0	\$0	\$0	\$0	\$0	\$0
TASK 4.3	Right-of-Way Search	0	\$0	\$0	\$0	\$0	\$0
TASK 4.4 TASK 4.5	Utility Investigation	0	\$0	\$0	\$0	\$0	\$0
TASK 4.8	Initial Geotechnical Investigation Navigation Study	100	\$4,930	\$10,893	\$15,823	\$1,582	\$17,406
TASK 4.8	Conceptual Design	0	\$0	\$0	\$0	\$0	\$0
171011 4.0	Alignment Alternatives	0	\$0 \$0}	\$0	\$0 \$0	\$0	<u> </u>
2		0	50	\$0 \$0	\$0	\$0 \$0	\$0 \$0
	Movable Span	0		\$0	50		\$0
	Approach Spans	ő	50	\$0	50	50	
3	Civil Design	0	50	\$0	\$0	50	\$0
- 4	Traction Power/Electrical	0	\$0	\$0	\$0	\$0	\$0
5	Constructability	0	\$0	\$0	\$0	\$0	\$0
6	Construction Cost	0	\$0	\$0	\$0	\$0	\$0
7	Construction Schedule	0	\$0	\$0	\$0	\$0	\$0
TASK 4.9	Feasibility Report	0	\$0	\$0	\$0	\$0	\$0
TASK 4.10	Value Engineering	0	\$0	\$0	\$0	\$0	\$0
ASK 4.11	NEPA Consultant Coordination	0	\$0	\$0	\$0]	\$0	\$0
	TOTAL PHASE IA	100	\$4,930	\$10,893	\$15,823	\$1,582	\$17,405
HASE IB -	PRELIMINARY DESIGN				Ì		
ASK 4.12	Preliminary Design	190	\$9,863	\$21,791	\$31,654	\$3,165	£34 800
4.12.A	Update Design Criteria	0	\$8,863	\$21,791	\$31,854	\$3,165	\$34,820 \$0
4.12.8	Bridge Design	0	50	\$0			\$0
-	Movable Span - Structural	- 0	50		50	50 50	\$0
	Movable Span - Electrical	ō	50	50	50	\$0	\$0
	Movable Span - Mechanical	0	\$0	\$0	\$0	\$0	\$0
	Approach Spans	0	\$0	\$0	50	\$0	50
4.12.C	Track Design	0	\$0	\$0	\$0	\$0	\$0
4.12.D	Preliminary Civil Design	190	\$9,863	\$21,791	\$31,654	\$3,165	\$34,820
4.12.E	Buildings & Facilities	0	\$0	\$0	\$0	\$0	\$0
4.12.F	Traction Power/Electrical/Bridge Controls	0	\$0	\$0	\$0	\$0	\$0
	Traction Power	0	\$0	\$0	50	\$0	= \$0
	Electrical Bridge Controls	0	\$0	\$0	50	\$0	\$0
4.12.G	Bridge Controls Signal Systems	0	\$0 \$0	\$0	\$0	\$0	\$0
4.12.H	Communications	0	<u>\$0</u> \$0	\$0 \$0	\$0 \$0	\$0 \$0	\$0
4.12.1	Cost & Schedule	0	50	\$0		\$0	\$0 \$0
ASK 4.13	Supplemental Survey	0	\$0	\$0	\$0	\$0	\$0
ASK 4.14	ROW & Property Acquisition (PAECE)	0	\$0	\$0	\$0	\$0	\$0
ASK 4.15	Utility Relocation	0	50	\$0	50	50	50
ASK 4.16	Detailed Geotech Investigation	3,520	\$146,551	\$323,789	\$470,540	\$47,034	\$517,374
ASK 4.16	As Directed - Preliminary Design	0	\$0	\$0	\$0	\$0	\$017,514
	TOTAL PHASE IB	3,710	\$156,414	\$345,581	\$501,995		-
		i -		· · · ·	1	\$50,199	\$552,194
_	TOTAL PHASE I	3,810	\$161,344	\$356,474	\$517,818	\$51,782	\$569,600
	TOTAL LABOR	3,824	\$162,404	\$358,815	\$521,218	\$52,122	\$573,340
			~				9010,040
	DIRECT EXDENSES						
	DIRECT EXPENSES TOTAL COST						\$31,755

FIRM:	Griffin

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL CO
ASK 1	PROJECT MANAGEMENT	0	\$0	\$0	\$0	\$0	
1.0		0	\$0	\$0	\$0	\$0	
1.0		0	<u>\$0</u> \$0	\$0 \$0	\$0 \$0	\$0	
1.0		- 0	30 \$0	\$0	\$0	\$0 \$0	
1.0		Ő	50	50	\$0	\$0	-
1.0		0	\$0	\$0	50	50	
1.0		0	- \$0	\$0	\$0	\$0	
1.0		0	\$0	\$0	\$0	\$0	
1.0		0	\$0	\$0	\$0	\$0	
1.1		0	\$0	- \$0	\$0	\$0	
1.1		0	\$0	\$0	\$0	\$0	
-1.1		- 0	\$0	\$0	\$0	_ \$0	
1.1		0	\$0	\$0	\$0	\$0	
1.1		0	\$0	\$0	\$0	\$0	
ASK 2	RISK MANAGEMENT	Ó	\$0	\$0	\$0	\$0	
_	Risk Identification	0	\$0	\$0	\$0	\$0	
	Preliminary Workshop	. 0	\$0	\$0	\$0	\$0	
-	Draft Risk Register Risk Management Workshop	0	\$0	\$0	\$0	\$0	
	Risk Register	0	\$0	\$0	\$0	\$0	_
	Risk Management Plan		\$0	\$0	\$0	\$0	
ISK 3		0	\$0	\$0	\$0	\$0	
	SYSTEM SECURITY & EMERGENCY MGMT	0	\$0	\$0	\$0	\$0	-
	CONCEPTUAL & PRELIMINARY DESIGN						
	CONCEPTUAL DESIGN						
SK 4.1	Data Collection & Design Criteria	0	\$0	\$0	\$0	\$0	-
SK 4.2	Survey & Base Mapping	0	\$0	\$0	\$0	\$0	
ISK 4.3	Right-of-Way Search	0	\$0	\$0	\$0	\$0	_
SK 4.4	Utility Investigation	Ó	\$0	\$0	\$0	50	
SK 4.5	Initial Geotechnical Investigation	0.	\$0	\$0	\$0	\$0	
SK 4.7	Navigation Study	0	\$0	\$0	\$0	\$0	
SK 4.8	Conceptual Design	100	\$9,000	\$13,707	\$22,707	\$2,271	\$24,9
	Alignment Alternatives	0	\$0	\$0	\$0	\$0	
2		0	\$0	\$0	\$0	\$0	
	Movable Span	0	\$0	\$0	50	\$0	
	Approach Spans	0	\$0	\$0	\$0	\$0	
3		0	\$0	\$0	\$0	\$0	
4		0	\$0	\$0	\$0	\$0	
5		100	\$9,000	\$13,707	\$22,707	\$2.271	\$24,9
		0	\$0	\$0	\$0	\$0	
6× 4 0	Construction Schedule	0	\$0	\$ 0	\$0	\$0	
SK 4.9	Feasibility Report	0	\$0	\$0	\$0	\$0	
SK 4.10	Value Engineering	0		SO			
			\$0		\$0	\$0	
5N 4.11	NEPA Consultant Coordination	0	\$0	\$0	\$0	\$0 \$0	
-	TOTAL PHASE IA						
ASE IB -	TOTAL PHASE IA PRELIMINARY DESIGN	0	\$0	\$0	\$0	\$0	\$24,97
ASE 18 - SK 4.12	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design	0 100	\$0 \$9,000 \$0	\$0 \$13,707 \$0	\$0	\$0	\$24,97
ASE 1B - SK 4.12 4.12.A	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria	0	\$0 \$9,000 \$0 \$0	\$0 \$13,707 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design	0 100 0 0 0	\$0 \$9,000 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 1B - SK 4.12 4.12.A	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural	0 100 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12.A	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical	0 100 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12.A	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical	0 100 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12.A 4.12.B	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans	0 100 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE IB - SK 4.12 4.12.A 4.12.B	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 1B - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.C	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design - Structural Movable Span - Structural Movable Span - Electrical Movable Spans Track Design Preliminary Civil Design	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12 A 4.12 B 4.12 C 4.12 C 4.12 D 4.12 L	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design - Structural Movable Span - Structural Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 1B - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.C	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design - Structural Movable Span - Structural Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,8
ASE 18 - SK 4.12 4.12 A 4.12 B 4.12 C 4.12 C 4.12 D 4.12 L	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Structural Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Tracton Power		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12 A 4.12 B 4.12 C 4.12 C 4.12 D 4.12 L	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Tracton Power Electrical	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.D 4.12.C 4.12.C 4.12.F	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design - Electrical Movable Span - Structural Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Electrical Bridge Controls		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12 A 4.12 B 4.12 B 4.12 C 4.12 D 4.12 C 4.12 C 4.12 F 4.12 F	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design - Structural Movable Span - Structural Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bindge Controls Signal Systems		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.A 4.12.C 4.12.D 4.12.C 4.12.D 4.12.C	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Structural Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Clivil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Signal Systems Communications		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9 \$24,9 3 3 3 3 3 3 3 3 3 3 3 3 3
ASE 18 - SK 4.12 4.12 A 4.12 B 4.12 C 4.12 C 4.12 D 4.12 C 4.12 D 4.12 C 4.12 C 4.12 C 4.12 L 4.12 C 4.12 A 4.12 A 4.1	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9 \$24,9 3 3 3 3 3 3 3 3 3 3 3 3 3
ASE 18 - ŠK 4.12 4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.G 4.12.H 4.12.I 5K 4.13	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Controls Signal Systems Conta & Schedule Supplemental Survey		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.F 4.12.F 4.12.G 4.12.H 4.12.I SK 4.13 SK 4.14	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Structural Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bindge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE)		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9 \$24,9 3 3 3 3 3 3 3 3 3 3 3 3 3
ASE 18 - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.F 4.12.E 4.12.F 4.12.A 4.12.C 4.12.D 4.12.C 4.12.D 4.12.C 4.12.D 4.12.C 4.12.D 4.12.C 4.12.D 4.12.C 4.12.D 4.12.C 4.12.D 4.12.C	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Signal Systems Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9 \$24,9 5 5 5 5 5 5 5 5 5 5 5 5 5
ASE 18 - ŠK 4.12 4.12.A 4.12.B 4.12.C 4.12.D 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.C 4.12.A 5 K 4.13 5 K 4.15 6 6 6 6 7 7 8 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Signal Systems Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
ASE 18 - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.D 4.12.C 4.12.C 4.12.C 4.12.C 4.12.F 4.12.G 4.12.G 4.12.G 4.12.I SK 4.13 SK 4.13 SK 4.16 SK 4.16	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
ASE 18 - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.D 4.12.C 4.12.C 4.12.C 4.12.C 4.12.F 4.12.G 4.12.G 4.12.G 4.12.I SK 4.13 SK 4.13 SK 4.16 SK 4.16	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE IB	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
ASE 18 - SK 4.12 4.12.A 4.12.B 4.12.C 4.12.D 4.12.C 5.K 4.13.S 5.K 4.14.S 5.K 4.16.S 5.K 5.K 5.K 5.K 5.K 5.K 5.K 5.K	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Structural Movable Span - Structural Movable Span - Electrical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detalled Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
ASE 18 - SK 4.12 4.12 A 4.12 B 4.12 D 4.12 D 4.12 C 4.12 C	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE IB	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$24,9
ASE 18 - SK 4.12 4.12 A 4.12 B 4.12 C 4.12 D 4.12 C 4.12 C	TOTAL PHASE IA PRELIMINARY DESIGN Preliminary Design Update Design Criteria Bridge Design Criteria Bridge Design Structural Movable Span - Structural Movable Span - Electrical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detalled Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I		\$0 \$9,000 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$13,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$22,707 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$2,271 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	

FIRM:

Naik

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL CO
TASK 1	PROJECT MANAGEMENT	0	\$0	\$0	\$0	\$0	
1.01		0	\$0 \$0	\$0 \$0	\$0	\$0	
1.02		0	<u></u>	\$0 \$0	\$0 \$0	\$0 \$0	
1.04		0	\$0		\$0		_
1.05		0	\$0	50	\$0	50	
1.06		0	\$0	50	\$0	50	
1.07		0	\$0	\$0	\$0	\$0	
1.08		0	\$0	\$0	\$0	\$0	
1.09		0	\$0	\$0	\$0	\$0	
1.10		0	\$0	\$0	\$0	= \$0 ,	
1.11		0	\$0	\$0	\$0	\$0	
<u>1.12</u> 1.13		0	\$0	\$0	\$0	\$0	
1.14		0	\$0 \$0	\$0 \$0	\$0	\$0	
ASK 2	IRISK MANAGEMENT	0	50	÷-	\$0	\$0	_
MON 2	Risk Identification	0	<u>\$0</u> \$0	<u>\$0</u>	\$0 \$0	\$0	
	Preliminary Workshop	0		\$0 \$0		SO	
_	Draft Risk Register	0	\$0		\$0	\$0 \$0	
	Risk Management Workshop	-0	<u>50</u> \$0	\$0 \$0	\$0	50	
_	Risk Register	0	\$0	<u> </u>	\$0 \$0		_
_	Risk Management Plan	0	\$0	\$0	\$0	\$0	
ASK 3	SYSTEM SECURITY & EMERGENCY MGMT	0	\$0	\$0	\$0	\$0	
	ONCEPTUAL & PRELIMINARY DESIGN				- JUE	90	
HASE IA -	CONCEPTUAL DESIGN						
ASK 4.1	Data Collection & Design Criteria	0	\$0	\$0	50	\$0	
ASK 4.2	Survey & Base Mapping	706	\$25,260	\$32,103	\$57,362	\$5,736	\$63.
A\$K 4.3	Right-of-Way Search	300	\$12,479	\$15,859	\$28,338	\$2,834	\$31.
ASK 4.4	Utility Investigation	350	\$14,912	\$16,952	\$33,865	\$3,386	\$37.
ASK 4.5	Initial Geotechnical Investigation	0	\$0	\$0	\$0	\$0,000	
SK 4.7	Navigation Study	0	\$0	\$0	50	\$0	
ASK 4.8	Conceptual Design	300	\$11.304	\$14,366	\$25.670	\$2.567	\$28,3
1		0	\$0	50	50	\$0	42.01
2	Bridges	300	\$11,304	\$14,366	\$25,670	\$2,567	\$28.
	Movable Span	0	\$0	\$0	\$0	\$0	
	Approach Spans	300	\$11,304	\$14,366	\$25,670	\$2,567	\$28,2
3	Civil Design	0	\$0	\$0	\$0	\$0	
4		0	\$0	\$0	\$0	\$0	
5		0	\$0	\$0	<u>só</u>	\$0	
6	Construction Cost	0	\$0	\$0	\$0	\$0	
7	Construction Schedule	0	\$0	50	\$0	\$0	
ASK 4.9	Feasibility Report	8	\$436	\$554	\$990	\$99	\$1, 0
SK 4.10 SK 4.11	Value Engineering NEPA Consultant Coordination	0	\$0	\$0	\$0	\$0	
SK 4.11	TOTAL PHASE IA	0	\$0	\$0	\$0	\$0	
	PRELIMINARY DESIGN	1,664	\$64,391	\$81,834	\$146,225	\$14,623	\$160,0
SK 4.12	Preliminary Design	56	\$2,243	\$2,851	\$5,094	\$509	
4.12.A	Update Design Criteria		\$2,243	\$2,051	\$5,094	\$509 \$0	\$5,6
4.12.8	Bridge Design		\$0		\$0		
	Movable Span - Structural	0	\$0	50	\$0	\$0	
	Movable Span - Electrical	ŏ	\$0	\$0	50	\$0	
	Movable Span - Mechanical	Ő	\$0	50	50	\$0	-
	Approach Spans	ō	50	\$0	50	\$0	
4.12.C	Track Design	0	\$0	\$0	\$0	\$0	_
4.12.D	Preliminary Civil Design	0	\$0	\$0	\$0	\$0	
4.12.E	Buildings & Facilities	0	\$0	\$0	\$0	\$0	
4.12.F	Traction Power/Electrical/Bridge Controls	0	\$0	\$0	\$0	\$0	
	Traction Power	0	SO	\$0	\$0	\$0	
	Electrical	0	\$0	\$0	\$0	\$0	_
4 10 0	Bridge Controls	0	- \$0	50	\$0	\$0	
4.12.G	Signal Systems Communications	0	\$0	\$0	\$0	\$0	
4.12.H 4.12.I	Cost & Schedule	0	\$0	\$0	\$0	\$0	
9.12.1 SK 4.13	Supplemental Survey	56 484	\$2,243	\$2,851	\$5,094	\$509	\$5,6
SK 4.13	ROW & Property Acquisition (PAECE)		\$17,307	\$21,995	\$39,302	\$3,930	<u> </u>
SK 4.15	Utility Relocation	152	\$6,466	\$8,218	\$14,685	\$1,468	\$16,1
SK 4.16	Detailed Geotech Investigation	1,/48	\$69,225	\$87,978	\$157,203	\$15,720	\$172,9
SK 4.18	As Directed - Preliminary Design	300	\$10,606	\$0 \$13,479	\$0	\$0 \$2,409	\$26,4
	TOTAL PHASE IB		1			1	
	TOTAL PHASE I	2,740	\$105,847	\$134,521	\$240,369	\$24,037	\$264,4
	IVIAL PRASE I	4,404	\$170,238	\$216,356	\$386,594	\$38,659	\$425,2
	TOTAL LABOR	4,404	\$170,238	\$216,356	\$386,594	\$38,659	\$425,2
	TOTAL LABOR DIRECT EXPENSES	4,404	\$170,238	\$216,356	\$386,594	\$38,659	\$425,2 \$192,4

TOTAL COST

\$617,733

FIRM:	Envision

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL CO
TASK 1	PROJECT MANAGEMENT	1,820	\$82,290	\$113,157	\$195,447	\$19,545	\$214,9
1.0		0	\$0	\$0	\$0	\$0	
1.0		0	\$0 \$0	\$0 \$0	\$0 \$0	\$0 \$0	_
1.0		1,370	\$57,540	\$79,123	\$136,663	\$13,666	\$150.3
1.0		0	\$0	\$0	\$0	\$0	
1.0		0	\$0	\$0	\$0	\$0	
1.D 1.0		0	\$0 \$0	\$0 \$0	\$0 \$0	\$0 \$0	
1.0		0		\$0	<u>\$0</u> \$0		-
1.1		200	\$11,000	\$15,126	\$26,126	\$2,613	\$28,7
1.1		0	\$0	\$0	\$0	\$0	
1.1		250	\$13,750	\$18,908	\$32,658	\$3,266	\$35,9
1.1		0	\$0 \$0	\$0 \$0	\$0 \$0	\$0 \$0	
ASK 2	RISK MANAGEMENT	0	\$0	\$0	\$0	\$0	
	Risk Identification	0	\$0	\$0	50	501	
	Preliminary Workshop	0	\$0	\$0	\$0		
_	Draft Risk Register	0	\$0	SÖ	\$0	S 0	-
_	Risk Management Workshop Risk Register	0	\$0 \$0	\$0	\$0	\$0	
-	Risk Management Plan	0		\$0 \$0	\$0 \$0	\$0 \$0	
ASK 3	SYSTEM SECURITY & EMERGENCY MGMT	0	\$0	50	\$0	\$0	
	CONCEPTUAL & PRELIMINARY DESIGN		ţ.				
	CONCEPTUAL DESIGN						
ASK 4.1							
ASK 4.1 ASK 4.2	Data Collection & Design Criteria Survey & Base Mapping	0	\$0 \$0	\$0	\$0	\$0	
ASK 4.3	Right-of-Way Search	0	50/	\$0 \$0	\$0 \$0	\$0 \$0	
ASK 4.4	Utility Investigation	0	\$0	\$0	50	\$0	
ASK 4.5	Initial Geotechnical Investigation	0	\$0	\$0	\$0	\$0	
ASK 4.7	Navigation Study	Ő.	\$0	\$0	- \$0	- \$0	
ASK 4.8	Conceptual Design	0	\$0	\$0	\$0	\$0	
1	Alignment Alternatives	0	\$0	\$0	\$0	\$0	=
	2 Bridges Movable Span	0	\$0 \$0	\$0 \$0	50	\$0	
	Approach Spans	0		\$0	\$0 \$0		3
3		0	\$0	\$0	\$0	\$0	
. 4		0	\$0	\$0	\$0	\$0	
5		0	\$0	\$0	\$0,	\$0	
6	Construction Cost Construction Schedule	0	\$0 \$0	50 \$0	\$0 \$0	\$0	
ASK 4.9	Feasibility Report	0	\$0	\$0	\$0		_
ASK 4.10	Value Engineering	516	\$39,789	\$54,714	\$94,503	\$9,450	\$103.95
ASK 4.11	NEPA Consultant Coordination	0	\$0	\$0	\$0	\$0	
	TOTAL PHASE IA	516	\$39,789	\$54,714	\$94,503	\$9,450	\$103,95
HASE IB -	PRELIMINARY DESIGN					001-00	
	FRELIMINARI DEGRUM						
ASK 4.12		0	and the second	1			
ASK 4.12 4,12.A	Preliminary Design Updale Design Criteria	0	102	50			
	Preliminary Design		\$0 \$0		\$0 \$0		
4,12.A	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural	0	\$0 \$0	\$0 \$0	\$0 \$0	\$0 \$0	5 5 5
4,12.A	Preliminary Design Update Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical	0 0 0	\$0 \$0 \$0	\$0 \$0 \$0	\$0 \$0 \$0	\$0 \$0 \$0	\$
4,12.A	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical	0 0 0 0	\$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	1 5 5
4.12.A 4.12.B	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans	0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0	1 5 5 5 5
4,12.A	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical	0 0 0 0	\$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0	1 5 5 5 5 5
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D 4.12.E	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities	0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0	
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D 4.12.E	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D 4.12.E	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	
4.12.A 4.12.B 4.12.C 4.12.C 4.12.D 4.12.E	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
4.12.A 4.12 B 4.12 B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.G 4.12.H	Preliminary Design Updale Design Criteria Bridge Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facikties Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
4.12.A 4.12 B 4.12.C 4.12.D 4.12.C 4.12.D 4.12.E 4.12.E 4.12.F 4.12.G 4.12.H 4.12.J	Preliminary Design Updale Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
4.12.A 4.12 B 4.12 C 4.12.D 4.12.C 4.12.E 4.12.E 4.12.F 4.12.G 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Cost & Schedule Supplemental Survey	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bindings & Stans Controls Signal Systems Consumications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.C 4.12.H 4.13.H 5.K 4.13.H 5.K 4.15.H	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bindge Controls Signal Systems Const & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 55K 4.13 55K 4.15 55K 4.15	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bindings & Stans Controls Signal Systems Consumications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 55K 4.13 55K 4.15 55K 4.15	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bindge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 55K 4.13 55K 4.15 55K 4.15	Preliminary Design Updale Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.F 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K 4.12.K	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bindge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.I 4.12.I 4.12.I 5K 4.13 5K 4.15 \$K 4.15	Preliminary Design Updale Design Criteria Bridge Design Criteria Bridge Design Criteria Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design		\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
4.12.A 4.12.B 4.12.C 4.12.D 4.12.E 4.12.F 4.12.F 4.12.I 4.12.I 4.12.I 5K 4.13 5K 4.15 \$K 4.15	Preliminary Design Updale Design Criteria Bridge Design Movable Span - Structural Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3

FIRM:	JCMS

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL COS
TASK 1	PROJECT MANAGEMENT	0	\$0	\$0	\$0	\$0	
1.0		0	\$0	\$0	\$0	\$0	4
1.02			\$0	\$0	\$0	\$0	5
1.04		0	\$0 \$0	\$0 \$0	50	\$0	
1.05		0	\$0	\$0	\$0 \$0	\$0 \$0	
1.06		0	\$0	\$0	\$0	\$0	
1.07	7 Quality Management Plan (QMP)	0	\$0	\$0	SÓ	50	
1.08		0	\$0	\$0	\$0	\$0	5
1.09		0	\$0	\$0	\$0	\$0	5
1.10		0	\$0	\$0	\$0	\$0	
1.11		0	\$0	\$0	\$0	\$0	
1.12		0	\$0	\$0	\$0	\$0	
1.13		0	\$0	\$0	\$0	\$0	\$
1.14 TASK 2	Payment Procedures	0	\$Ó	\$0	\$0	\$0	1
ASK 2	Risk Identification	0	\$0	\$0	\$0	\$0	
	Preliminary Workshop	0	\$0 \$0	\$0	\$0	<u>\$0</u>	5
	Draft Risk Register		\$0	\$0	\$0 \$0	\$0 \$0	
-	Risk Management Workshop		\$0	\$0	50		
	Risk Register	0	\$0	\$0	\$0	\$0	\$
	Risk Management Plan	0	\$0	\$0	\$0	\$0	
TASK 3	SYSTEM SECURITY & EMERGENCY MGMT	0	\$0	\$0	\$0	\$0	
	CONCEPTUAL & PRELIMINARY DESIGN		40		40		
	CONCEPTUAL DESIGN			-			
ASK 4.1	Data Collection & Design Criteria	0	\$0	\$0	\$0	\$0	
ASK 4.2	Survey & Base Mapping	0	\$0	\$0	\$0	\$0	
ASK 4.3	Right-of-Way Search	0	\$0	\$0	\$0	\$0	- \$
ASK 4.4	Utility Investigation	0	\$0	\$0,	\$0	\$0	5
ASK 4.5	Initial Geotechnical Investigation	0	\$0	\$0	\$0	\$0	- \$
ASK 4.7	Navigation Study	0	\$0	\$0	\$0	\$0	\$
ASK 4.8	Conceptual Design	520	\$30,108	\$35,322	\$65,430	\$6,543	\$71,97
1	Alignment Alternatives	0	\$0	\$0	\$0	\$0	
2		0	\$0	\$0	\$0	\$0	\$
	Movable Span Approach Spans	0	\$0	\$0	\$0	\$0	54
3		0	\$0 \$0	\$0	50	\$0	\$
- 4		0	\$0	\$0 \$0	\$0	\$0	\$
5		0	\$0	\$0	\$0 \$0	\$0 \$0	5
6		320	\$18,558	\$21,772	\$40,329	\$4,033	\$44.36
7		200	\$11,550	\$13,550	\$25,100	\$2,510	\$44.30
ASK 4.9	Feasibility Report	0	\$0	\$0	\$20,100	\$2,510	
ASK 4.10	Value Engineering	16	\$1,019	\$1,195	\$2,214	\$221	\$2,43
ASK 4.11	NEPA Consultant Coordination	0	\$0	\$0	\$0	\$0	\$2,43
	TOTAL PHASE IA	536	634 406	1			
		536	\$31,126	\$36,517	\$67,644	\$6,764	\$74,40
	PRELIMINARY DESIGN						
ASK 4.12	Preliminary Design	478	\$27,303	\$32,032	\$59,335	\$5,933	\$65,260
4.12.A	Update Design Criteria	0	\$0	\$0	\$0	\$0	\$0
4.12.B	Bridge Design	0	\$0	\$0	\$0	\$0	- 50
	Movable Span - Structural	0	\$0	\$0	\$0	50	- \$0
	Movable Span - Electrical	0	\$0	\$0	50	\$0	\$(
	Movable Span - Mechanical	0	\$0	\$0	50	\$0	\$(
4.12.C	Approach Spans	0	\$0	\$0	\$0	\$0	\$0
4.12.D	Preliminary Civit Design	0	\$0	\$0	\$0	\$0	\$
4,12.D	e realminary Gran Design	0	\$0 \$0	\$0	\$0	\$0	5
	Buildings & Encilities		201	\$0	\$0	\$0	\$I
	Buildings & Facilities Traction Power/Flactrical/Bridge Controls	0			201		
4.12.F	Traction Power/Electrical/Bridge Controls	0	\$0	\$0	\$0	\$0	-
	Traction Power/Electrical/Bridge Controls Traction Power	0	\$0 \$0	\$0 \$0	50	\$0	- \$0
	Traction Power/Electrical/Bridge Controls Traction Power Electrical	0 0 0	\$0 \$0 \$0	\$0 \$0 \$0	\$0 \$0	\$0 \$0	\$(
	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls	0 0 0 0	\$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0	\$0 \$0 \$0	\$0 \$0 \$0	\$ \$ \$
4.12.F	Traction Power/Electrical/Bridge Controls Traction Power Electrical	0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0	\$(\$(\$)
4.12.F 4.12.G	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems	0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0	\$(\$(\$) \$1 \$1 \$1
4.12.F 4.12.G 4.12.H 4.12.H	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications	0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$32.032	\$0 \$0 \$0 \$0 \$0 \$59,335	\$0 \$0 \$0 \$0 \$0 \$0 \$5,933	\$65,265
4.12.F 4.12.G 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H 4.12.H	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule	0 0 0 0 0 0 0 0 478	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$27,303	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$5,933 \$0	\$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$
4.12.F 4.12.G 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation	0 0 0 0 0 0 0 0 0 478 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$27,303 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$32,032 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$59,335 \$0	\$0 \$0 \$0 \$0 \$0 \$5,933 \$0 \$5	\$65,265
4.12.F 4.12.G 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.16	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation	0 0 0 0 0 0 0 478 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$27,303 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$32,032 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$59,335 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$5,933 \$0	\$65,265
4.12.F 4.12.G 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation	0 0 0 0 0 0 0 478 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$27,303 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$32.032 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$59,335 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$5,933 \$5,933 \$0 \$0 \$0 \$0	\${ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
4.12.F 4.12.G 4.12.H 4.12.H 4.12.I 3SK 4.13 3SK 4.14 3SK 4.15 3SK 4.16	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation	0 0 0 0 0 0 0 478 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$59,335 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$5,933 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
4.12.F 4.12.G 4.12.H 4.12.H 4.12.I 3SK 4.13 3SK 4.14 3SK 4.15 3SK 4.16	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE IB	0 0 0 0 0 0 478 0 0 0 0 0 0 0 0 0 478	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$27,303	\$0 \$0 \$0 \$0 \$0 \$0 \$32.032 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$59,335 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$5,933 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$65.265 \$65.26
4.12.F 4.12.G 4.12.H 4.12.H 4.12.I 3SK 4.13 3SK 4.14 3SK 4.15 3SK 4.16	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	0 0 0 0 0 0 0 478 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$59,335 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$5,933 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$(\$(\$) \$(\$(\$) \$(\$)
4.12.F 4.12.G 4.12.H 4.12.H 4.12.I 3SK 4.13 3SK 4.14 3SK 4.15 3SK 4.16	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE IB	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$59,335 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$126,978	\$0 \$0 \$0 \$0 \$0 \$5,833 \$0 \$0 \$0 \$0 \$0 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
4.12.F 4.12.G 4.12.H 4.12.H 4.12.H 4.12.I SK 4.13 SK 4.14 SK 4.15 SK 4.16	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I TOTAL PHASE I	0 0 0 0 0 0 478 0 0 0 0 0 0 0 0 0 478	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$27,303	\$0 \$0 \$0 \$0 \$0 \$0 \$32.032 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$59,335 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$5,933 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$4 55 56 565,264 565,264 54 55 55 55 55 55 55,264 \$139,676 \$139,676
4.12.F 4.12.G 4.12.H 4.12.H 4.12.I SK 4.13 SK 4.14 SK 4.15 SK 4.16	Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$0 \$0 \$59,335 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$126,978	\$0 \$0 \$0 \$0 \$0 \$5,833 \$0 \$0 \$0 \$0 \$0 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$20 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$

FIRM:	Radin

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL COS
ASK 1	PROJECT MANAGEMENT	0	\$0	\$0	\$0	\$0	
1.01		0	\$Ō	\$0	\$0	\$0	
1.02		0	\$0		\$0	\$0	
1.03		0	\$0	· · ·	\$0	\$0	
1.04		0	\$0	\$0	\$0	\$0	
1.0		0	\$0	\$0	\$0	\$0	
1.07		0	\$0	\$0	<u>\$0</u>	\$0	
1.07		0	\$0	\$0	\$0	\$0	
1.00			\$0	\$0	\$0	\$0	
1.08		0	\$0 \$0	\$0	\$0	<u>\$0</u>	
1.11		0		\$0	\$0	\$0	
1.12		Ó	\$0	\$0	\$0	\$0	
1.12			<u>\$0</u>	\$0	\$0	\$0	
1.14		0	\$0 \$0	\$0	\$0	\$0	
ASK 2	RISK MANAGEMENT			\$0	\$0	\$0	
MJN 2	Risk Identification	0	\$0	\$0	\$0	\$0	
	Preliminary Workshop		\$Ö \$Ó	\$0	\$0	\$0	
	Draft Risk Register	0		\$0	\$0	\$0	
	Risk Management Workshop	0	\$0	\$0	\$0	\$0	
	Risk Register		\$0	\$0	\$0	\$0	
	Risk Management Plan	0	\$0. \$0	\$0 \$0	\$0 \$0	\$0	
ASK 3						\$0	_
	SYSTEM SECURITY & EMERGENCY MGMT	0	\$0	\$0	\$0	\$0	_
HASEI	CONCEPTUAL & PRELIMINARY DESIGN						
HASE IA -	CONCEPTUAL DESIGN						
ASK 4.1	Data Collection & Design Criteria	0	\$0	¢n			
ASK 4.1	Survey & Base Mapping	0	\$0	<u>\$0</u>	\$0 \$0	\$0	
ASK 4.3	Right-of-Way Search	Ó	\$0			\$0	
ASK 4.4	Utility Investigation	0		\$0	\$0	\$0	
ASK 4.5	Initial Geotechnical Investigation	0	\$0	\$0	\$0	\$0	
ASK 4.7	Navigation Study	0	\$0	\$0	\$0	\$0	
ASK 4.8			\$0	\$0	\$0	\$0	
	Conceptual Design Alignment Alternatives		\$0	\$0	\$0	\$0	
		0	\$0	\$0	\$0	\$0	
2		0	\$0	\$0	\$0	\$0	5
	Movable Span	0	\$0	50	\$ 0	\$0	- \$
-	Approach Spans	0	\$0	\$0	\$0	\$0	\$
3		0	\$0	\$0	\$0	\$0	5
4		0	\$0	\$0	\$0	\$0	\$
5		0	\$0	\$0	\$0	\$0	\$
		0	\$0	\$0	\$0	\$0	\$
ASK 4.9		0	\$0	\$0	\$0	\$0	\$
ASK 4.10	Feasibility Report	. 0	\$0	\$0	\$0	\$0	\$
ASK 4.11	Value Engineering NEPA Consultant Coordination	0	\$0.	\$0	\$0	\$0.	5
A3N 4.11			\$0	\$0	\$0		\$
	TOTAL PHASE IA	0	\$0	\$0	\$0	50	\$
HASE IB -	PRELIMINARY DESIGN	1					
ASK 4.12		004	\$40 TOT			4.4.4.4	
4.12.A	Pretiminary Design	281	\$10,737	\$16,661	\$27,398	\$2,740	\$30,13
4.12.A	Update Design Criteria	0	\$0	\$0	\$0	\$0	\$
4.12.D	Bridge Design	100	\$3,821	\$5,929	\$9,750	\$975	\$10,72
_	Movable Span - Structural Movable Span - Electrical	0	\$0	\$0	\$0	<u>so</u>	5
		0	50	\$0		\$0	
-	Movable Span - Mechanical Approach Spans	0	50	\$0	\$0	\$0	5
4,12.C	Track Design	100	\$3,821	\$5,929	\$9,750	\$975	\$10,72
4.12.C		0	\$0	\$0	\$0	\$0	\$
4.12.D 4.12.E	Preliminary Civil Design	0	\$0	\$0	\$0	\$0	S
4.12.E	Buildings & Facilities Traction Power/Electrical/Bridge Controls	- 0	\$0	\$0	\$0	\$0	\$
4.12.F	Traction Power/Electrical/Bridge Controls	181	\$6,916	\$10,732	\$17,648	\$1,765	\$19,41
	Electrical		50	\$0	\$0	\$0	\$
	Bridge Controls		\$6,916	\$10,732	\$17,648	\$1,765	\$19,41
4.12.G	Signal Systems	0	\$0	\$0	\$0	\$0	5
4.12.G	Communications	0	\$0	50	\$0	\$0	\$
4.12.1	Contractions Cost & Schedule		\$0	\$0	\$0	<u>\$0</u>	S
SK 4.13	Supplemental Survey		\$0	\$0	\$0	\$0	
SK 4.14		0	\$0	\$0	\$0	\$0	- \$
SK 4.14	ROW & Property Acquisition (PAECE)	0	\$0	\$0	\$0	\$0	\$
	Utility Relocation	0	<u>\$0</u>	\$0	\$0	\$0	
SK 4.16	Detailed Geotech Investigation As Directed - Preliminary Design	0	\$0	\$0	\$0	\$0	\$
SK 4.18		0	\$0	\$0	\$0	\$0	\$
	TOTAL PHASE IB	261	\$10,737	\$16,661	\$27,398	\$2,740	\$30,13
	TOTAL PHASE I	i	-				
		281	\$10,737	\$16,661	\$27,398	\$2,740	\$30,13
-	TOTAL LABOR	- 281	\$10,737	\$16,661	\$27,398	\$2,740	\$30,13
	TOTAL LABORS					46.790	
_							
-	DIRECT EXPENSES						\$22

FIRM:	SJH

TASK	DESCRIPTION	TOTAL HOURS	SALARY	OVERHEAD	SUBTOTAL	FIXED FEE	TOTAL COS
TASK 1	PROJECT MANAGEMENT	0	- \$0	\$0	\$0	\$0	1
1.0		0	\$0	\$0	\$0	\$0	- 5
1.0		0	\$0	\$0	\$0	\$0	5
1.0		0	\$0	\$0	\$0	\$0	5
1.0		0	\$0 \$0	\$0	\$0 \$0	\$0	5
1.0	6 Quality Control		\$0	\$0	\$0	\$0 \$0	\$ \$
1.0			\$0	\$0	\$0	\$0 \$0	\$
1.08		0	\$0	\$0	\$0	SÓ	5
1.09		0	\$0	\$0	\$0	\$0	\$
1.10		0	\$0	\$0	\$0	\$0	\$
1.11		0	\$0	\$0	\$0	\$0	- 5
1.12		0	\$0	\$0	\$0	\$0	\$
1.13		0	\$0	\$0	\$0	\$0	\$
TASK 2	RISK MANAGEMENT	0	\$0	\$0	\$0	\$0	- 5
India 2	Risk Identification	0	\$0 \$0	\$0	\$0	\$0	\$
	Preliminary Workshop	0	\$0 \$0	<u>\$0</u> \$0	\$0	\$0	\$
	Draft Risk Register	0	\$0	\$0	\$0 \$0	\$0 \$0	\$
	Risk Management Workshop	0	\$0	\$0	\$0		\$ \$
	Risk Register	0	50	\$0	\$0	\$0	
	Risk Management Plan	- 0	50	\$0	\$0	\$0	
TASK 3	SYSTEM SECURITY & EMERGENCY MGMT	0	50	\$0	\$0	\$0	
PHASE I - C	CONCEPTUAL & PRELIMINARY DESIGN		Ţ.		,	40	
	CONCEPTUAL DESIGN						
TASK 4.1	Data Collection & Design Criteria	0	\$0	\$0	\$0		-
ASK 4.2	Survey & Base Mapping	0	50	\$0	50	\$0 \$0	<u> </u>
ASK 4.3	Right-of-Way Search	0	\$0	\$0	\$0	50	
TASK 4.4	Utility Investigation	ő	\$0	\$0	\$0	\$0	5
ASK 4.5	Initial Geotechnical Investigation	0	50	\$0	sol	\$0	
ASK 4.7	Navigation Study	Ö	50	50	50	50	5
ASK 4.8	Conceptual Design	176	\$10,301	\$14,422	\$24,723	\$2,472	\$27.19
1		0	\$0	\$0	\$0	\$0	\$
2		116	\$6,332	\$8,665	\$15,197	\$1,520	\$16.71
	Movable Span		\$0	\$0	\$0	\$0	\$(
_	Approach Spans	115	\$6,332	\$8,865	\$15,197	\$1,520	\$16,717
3		0		\$0	\$0	\$0	54
4		0	\$0	\$0	\$0	\$0	
5		0	\$0	\$0	\$0	\$0	\$(
6		60	\$3,969	\$5,557	\$9,526	\$953	\$10,47
ASK 4.9	Feasibility Report	0	\$0	\$0	\$0	\$0	\$1
ASK 4.10	Value Engineering	0	\$0 \$0	<u>\$0</u>	\$0	\$0	\$(
ASK 4.11	NEPA Consultant Coordination	0	\$0	\$0	\$0	\$0	<u> </u>
	TOTAL PHASE IA						
		176	\$10,301	\$14,422	\$24,723	\$2,472	\$27,19
and a state of the state	PRELIMINARY DESIGN						
ASK 4.12	Preliminary Design	136	\$7,578	\$10,610	\$18,188	\$1,819	\$20,007
4.12.A	Update Design Criteria	0	\$0	\$0	\$0	\$0	\$0
4.12.B	Bridge Design	88	#4 224	\$6,053	A . A . A		
	Manahia Casa Ct. 11		\$4.324	4.111111	\$10,377	\$1,038	\$11,415
	Movable Span - Structural	0	\$0	\$0	50	\$0	\$(
	Movable Span - Electrical	0	\$0 \$0	\$0 \$0	\$0 \$0	\$0 \$0	\$C
	Movable Span - Electrical Movable Span - Mechanical	0 0 0	\$0 \$0 \$0	\$0 \$0 \$0	\$0 \$0 \$0	\$0 \$0 \$0	
4.12.0	Movable Span - Electrical Movable Span - Mechanical Approach Spans	0 0 0 88	\$0 \$0 \$0 \$4,324	\$0 \$0 \$0 \$6,053	\$0 \$0 \$0 \$10,377	\$0 \$0 \$0 \$1,038	\$0 \$0 \$0 \$11,415
4.12.C 4.12.D	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design	0 0 0 88 0	\$0 \$0 \$0 \$4,324 \$0	\$0 \$0 \$6,053 \$0 \$0	\$0 \$0 \$0 \$10,377 \$0	\$0 \$0 \$0 \$1,038 \$0	<u>\$0</u> \$0 \$11,415 \$15
4.12.C 4.12.D 4.12.E	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design	0 0 88 0 0	\$0 \$0 \$4,324 \$0 \$4,324 \$0 \$0	\$0 \$0 \$6,053 \$0 \$0 \$0 \$0	\$0 \$0 \$10,377 \$0 \$0 \$0	\$0 \$0 \$0 \$1,038 \$0 \$0 \$0	\$6 \$0 \$11,415 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1
4.12.D	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design	0 0 0 88 0	\$0 \$0 \$0 \$4,324 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$6,053 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0	\$6 \$0 \$11,415 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1
4.12.D 4.12.E	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preilminary Civil Design Buildings & Facilities	0 0 88 0 0 0	\$0 \$0 \$4,324 \$0 \$4,324 \$0 \$0	\$0 \$0 \$6,053 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$11,415 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1
4.12.D 4.12.E	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical	0 0 88 0 0 0 0	\$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$6,053 \$6,053 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$11,415 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0
4.12.D 4.12.E 4.12.F	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls	0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$6,053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$10.377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$11,415 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1
4.12.D 4.12.E 4.12.F 4.12.G	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$11,412 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10
4.12.D 4.12.E 4.12.F 4.12.G 4.12.G 4.12.H	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$6,053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6 \$6 \$7 \$7 \$7 \$7 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6
4.12.D 4.12.E 4.12.F 4.12.G 4.12.G 4.12.G 4.12.H 4.12.J	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$5,053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6 \$6 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7
4.12.D 4.12.E 4.12.F 4.12.G 4.12.G 4.12.H 4.12.H 4.12.I A\$K 4.13	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$6.053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6 \$6 \$7 \$7 \$7 \$7 \$7 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6
4.12.D 4.12.E 4.12.F 4.12.G 4.12.G 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acguisition (PAECE)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$6.053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6 \$6 \$11,415 \$11,415 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10 \$10
4.12.D 4.12.E 4.12.F 4.12.G 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$6,053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$	\$0 \$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6 \$6 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6
4.12.D 4.12.E 4.12.F 4.12.G 4.12.G 4.12.H 4.12.I 4.12.I 4.12.I 4.12.I 4.12.I 4.12.I 4.12.I 4.12.G 4.12.K 4.14 ASK 4.15 ASK 4.16	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acguistion (PAECE) Utility Relocation Detailed Geotech Investigation	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$5.053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$10.377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6 \$6 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7
4.12.D 4.12.E 4.12.F 4.12.G 4.12.H 4.12.H 4.12.I ASK 4.13 ASK 4.14 ASK 4.15	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$6,053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$4 \$5 \$5 \$7 \$1 \$1 \$1 \$1 \$5 \$5 \$5 \$5 \$5 \$5 \$5 \$5 \$5 \$5
4.12.D 4.12.E 4.12.F 4.12.G 4.12.G 4.12.H 4.12.I 4.12.I 4.12.I 4.12.I 4.12.I 4.12.I 4.12.S 4.14 4.15 4.55 4.16	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acguistion (PAECE) Utility Relocation Detailed Geotech Investigation	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$5.053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$10.377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	50 51 51 51 51 51 50 50 50 51 51 51 51 51 51 51 51 51 51 51 51 51
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4.12.D 4.12.E 4.12.F 4.12.G 4.12.G 4.12.H 4.12.I 4.12.I 4.12.I 4.12.I 4.12.I 4.12.I 4.12.S 4.14 4.15 4.55 4.16	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$6.053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	50 51 51 51 51 51 50 50 50 51 51 51 51 51 51 51 51 51 51 51 51 51
4.12.D 4.12.E 4.12.F 4.12.G 4.12.H 4.12.J ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.16	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I TOTAL PHASE I	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$6,053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$6 \$6 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7 \$7
4.12.D 4.12.E 4.12.F 4.12.G 4.12.H 4.12.J ASK 4.13 ASK 4.14 ASK 4.15 ASK 4.16	Movable Span - Electrical Movable Span - Mechanical Approach Spans Track Design Preliminary Civil Design Buildings & Facilities Traction Power/Electrical/Bridge Controls Traction Power Electrical Bridge Controls Signal Systems Communications Cost & Schedule Supplemental Survey ROW & Property Acquisition (PAECE) Utility Relocation Detailed Geotech Investigation As Directed - Preliminary Design TOTAL PHASE I	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$0 \$0 \$0 \$4,324 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$6.053 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$10,377 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$1,038 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	\$4 \$4 \$17,41 \$1,41

NJ TRANSIT RFP No. 15-044

Design, Engineering and Construction Assistance Services for the Replacement of Raritan River Bridge

COST & FEE RECAP BY FIRM/TASK/INDIVIDUAL (RFP ATTACHMENT F-3)

		ESTIMATE BY INDIVIDU	ALITASK		
TASK:			FIRM:		
1	PROJECT TOTAL		H&H / GANN	ETT FLEMING	VL
NO,	PERSON NAME	PROJECT TITLE / DISCIPLIN	E ESTIMATED HOURS	HOURLY RATE	-
	HARDESTY & HANOVE		TERHEAD RATE	167,40%	
		HNICAL STAFF			
	Visha Szumanski, PE	PM. STR Eng Vill	1.460	\$95.66	\$141,41
_2	Charlie Geer, PE	Risk Manager	592	\$98.01	\$58.02
3	David Tuckman, PE	OPM, STR Eng VII	767	\$81.81	\$62,74
4	Steve Harlacker, PE, SE	QAQC, STR Eng VI	268	\$72.32	\$19,30
and the second sec	Sleve Hom, PE	STR Eng VII	60	\$80.39	\$4,6;
-6	Peter Roody, PE	STR Eng VIII	472	\$86.51	\$40.83
7	Michael Hawkins, PE	STR Eng VIII	370	\$106.14	\$39,27
8	Steve Mikucki, PE	MECH Eng VII	270	\$86.43	\$23.33
10	Alex Noble, PE Paul Connolly, PE	ELEC Eng VI	279	\$70.29	\$19,6
11		STR Eng VII	333	\$80.09	\$26,6
	Gien Schetelich, PE	STR Eng Vill	204	\$109.79	\$22,31
13	Raymond Mankbadi, PE	STR Eng VIII	690	\$86.58	\$59,74
14	Mishac Yegian, PE, PhD David Marcic, PE, SE	ŠTR Eng VIII	103	\$76.13	\$7,84
12 13 14 15 16 17 18 19 20 21	Jeny DiMaggio, PE	STR Eng VI	318	\$72.55	\$23,0
16		STR Eng VIII	60	\$76.13	\$4,5
17	David Gerber, PE Drew DeleDonne, RA	STR Eng VI	225	\$75.63	\$17,0
<u> </u>		STR Eng VI	<u> </u>	\$69.63	\$5,5
18		PPORT STAFF			
19	Support Staff	STR I-V	6,984	\$46.04	\$321,54
20	Support Staff	MECH I-V	810	\$46.04	\$37,29
21	Support Staff Support Staff	ELEC I V	606	\$46.04	\$37,10
- 61		CAD/ ADMIN	1,542	37.23	\$57,40
	GANNETT FLEMING		ERIEAD RATE	169.17%	-
		HNICAL STAFF			
2	Richard Cross, PE David Howell, PE	DPM	1.272	\$105.40	\$134.06
	Bruce Smith	Rail Sys. Lead	940	\$64.70	\$60,81
L Å	Robert Matthews, PE	Quality Control	0	\$63.60	\$
5	Steven Zapoliczny, PE	Site/Civil		\$79.20	\$30,25
6	Agnieszkia Lapinski, PE	Sr Sinctural	534	\$43.70	\$23,33
7	John Legath, PE	Track	186	\$72.00	\$13,39
8	Terry Shaniz, PE	Cat/ Trans	731	\$64.10	\$46,85
9	Bryan Shober, PE			\$99.20	\$4,76
10	Greg Nazarow	Call Trans	198	\$84.30	\$18,69
11	lan Martin	Rail Ops	62	\$79.20	54.91
12	Net Water	Rail Ops	78	\$76.60	\$5,97
13		Comms	185	\$73.70	\$13,63
	James Sgro	Comms	60		\$7.20
14	Theodore Bandy, PE	Sys Integ	123	\$100.00	\$12.30
16	Stephen Barkovich Richard Lentz	Sys. Integ.	488	\$59.10	\$28.84
10		Signats	49	\$81.90	\$4,01
18	Joseph Bonaduca Alireza Edraki, PE, PMP	Signals	78	\$100.70	\$7.85
18		Safety & Sec.	460	\$99.60	\$45,81
	McEwan van der Mandele, CP		360	\$77.70	\$27.97
<u> </u>	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30	5
20		PORT STAFF			
20	Technical Support Staff	Eng. Staff	5.506	\$50.37	\$277,33
41	Administrative Support Staff HALEY & ALDRICH	CAD/ ADMIN	1.617	\$43.14	\$69.75
			ERHEAD RATE	220.34%	
	Ed Zeminskie, PE	Lend Geotechnical Eng.			
2	Project Engineer		275	\$84.06	\$23,11
	Engineering Staff	Project Engineer	399	\$60.60	\$24.17
		Eng Staff	410	\$50.69	\$20.78
<u>⊢</u> ∸–	Junior Engineering Staff	Jr. Eng Staff	2,410	\$34.99	\$84.32
5	SUI	PORT STAFF			
	CADD/ Project Assistant GRUFFIN ENGINEERING		330	\$30.30	\$9.99
			ENHEAD NATE	182,30%	
	Joe Griffin, PE	INICAL STAFF		\$90.00	
			100		\$9.00

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	anuum		TOTAL SALARY			
		NAIK CONSULTING GR		RHEAD RATE	127.09%				
		TE.							
	1	John Tan, PE	PM	154	\$90.55	\$13,948			
1.5	2	Rich Baron	SURV PM	86	\$58,30	\$5,014			
100	3	Project Surveyor	SURV Proj. Surv.	168	\$47.50	\$7,980			
	4	Party Chief	SURV Inst. Tech.	408	\$37.21	\$15,182			
	5	Instrument Technician	SURV Inst. Tech.	408	\$28.62	\$11,677			
	6	Ron Rotunno, PE	UTIL Mgr	116	\$74.66	\$8,661			
	1	Senior Utility Engineer	UTIL Sen. Eng	280	\$45.79	\$12,821			
	8	Utility Engineering Staff	UTIL Eng Staff	760	\$37.79	\$29.476			
	9	Senior Structural Engineer	ISTR Sen, Eng.	128	\$54,50	\$6.976			
	10	Structural Engineering Staff	STR Eng Staff	422	\$29.22	\$12.331			
×	SUPPORT STAFF								
NAIK	11	CAD Manager	CAD Mgr	64	\$58,19	\$3.724			
Ž	12	CAD Technicians	CAD Tech	1.390	\$30.54	\$42,451			
		ENVISION	OVE	RHEAD RATE	137,51%				
	-	TE	CHNICAL STAFF						
1	1	Kurt Buettler	Doc. Ctrl. Mor	1,370	\$42.00	\$57.540			
z		Thomas Hartley	VE Team Lead	204	\$94.40	\$19,258			
Õ	3	Configuration Management	Config Mgmt.	450	\$55.00	\$24,750			
19	4	Value Engineering Team	VE Team	256	\$75 52	\$19,333			
ENVISION	SUPPORT STAFF								
ũ	5	Administration	Admin	56	\$21.40	\$1,198			
100		JCMS	OVE	RHEAD RATE	117.32%				
			CHMCAL STAFF						
67	1	K. Meehan	Senior Est.	462	\$63.67	\$29.416			
JCMS	2	Junior Estimator	Junion Est.	248	\$46.20	\$11,458			
¥.	3	Project Controls	PC	304	\$57.75	\$17.556			
	-	RADIN	OVÉ	RHEAD RATE	155.17%	011,000			
		TE	HNICAL STAFF						
₹.	1	Chitra Radin	Disc, Lead	٥r	\$100.00	\$0			
RADIN	-	SU	PPORT STAFF						
2	2	Beth Uczynski	CADIV	281	\$38,211	\$10,737			
1.00	percent.	SJH	OVE	RHEAD RATE	140.00%	310,737			
8		TEC	CHINICAL STAFF						
1	1	S. Jayakumaran	Civil Eng Vill	521	\$84.24	\$4,380			
H	2	Senior Engineering Staff	Sen. Eng Staff	158	\$59.58	\$9,294			
on	3	Engineering Staff	Eng, Statt	104	\$40.43	\$4,205			

TEAM SUM	MARY		
TOTAL ESTIMATED HOURS	42,341		
Total Salary			\$2,416,245
Overhead			\$3,818,045
Subtotal		-	\$5,234,290
Fixed Fee		10%	\$623,429
Total Direct Costs			\$2,522,322
TOTAL COST			\$9,380,041

	TASK		STIMATE BY INDIVIDUAL	FIRM:		-			
11	IAM.								
		Project Management			ETT FLEMING	JV			
	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR			
Űř.		HARDESTY & HANOVER		ERHEAD RATE	157,40%	Carlos -			
		And and a second se	NICAL STAFF	1.	-				
	1	Visha Szumanski, PE	PM, STR Eng VIII	1,400		\$135.6			
	2	Charle Geer, PE	Risk Manager	0		1			
	3	David Tuckman, PE	DPM, STR Eng VII	767	\$81.81	\$62.74			
	- 4	Steve Harlacker, PE, SE	QAQC, STR Eng VI	263	\$72.32	\$16.3			
	_	Steve Hom, PE	STR Eng Vil	0					
	6	Peter Roody, PE	STR Eng VIII	0	\$86.51				
۰.	7	Michael Hawkins, PE	STR Eng VIII	0	\$105.14				
1	8	Steve Mikucki, PE	MECH Eng VII	0	\$86.43				
	9	Alex Noble, PE	ELEC Eng VI	0	\$70.29	1			
		Paul Connolly, PE	STR Eng VII	0		1			
-	11	Glen Schetelich, PE	STR Eng VIII	0	\$109.79				
Ū	12	Raymond Mankbadi, PE	STR Eng VIII	0	\$86.58				
HANUVER	13	Mishac Yegian, PE, PhD	STR Eng VIII	0	\$76,13				
ξļ	14	David Marcic, PE, SE	STR Eng VI	C	\$72.55				
5	15	Jerry DiMappio.PE	STR Eng Vill	0	\$76.13	1			
	16	David Gerber, PE	STR Eng VI	0	\$75.63				
	17	Drew DelleDanne, RA	STR Eng VI	-0	\$69.83	-			
- 1	-	SUPF	ORT STAFF						
Ű.	18	Support Staff	STRI-V	0					
TARUESIT	19	Support Staff	MECH I-V	0	346.64	1			
21	20	Support Staff	ELEC I-V	ð	\$40.04	1			
5	-21	Support Staff	CADY ADMIN	Ő	\$37,23				
	GANNETT FLEMING OVERHEAD RATE 188,17%								
	TECHNICAL STAFF								
- 1	1	Richard Cross, PE	DPM	1.104	\$105,40	\$116,34			
- 1	2	David Howell, PE	Rei Sys. Last	50	\$64,70	\$5.17			
- 1	3	Bruce Smith	Quality Control	8	\$83.80				
1	4	Robert Matthews, PE	Civil Lead	142	\$79.20	\$11,24			
1	5	Steven Zapoticzny, PE	Sile/Civil	0	\$43.70				
- 1	8	Agnieszkka Lapinski, PE	Sr. Structural	Ó	\$72.00				
1	1	John Legath, PE	Track	12	\$64.10	176			
- 1	8	Torry Shantz, PE	Call Trans	0	\$99,20				
1	. 9	Brywn Shober, PE	Cat! Trans	0	\$84.30				
1	10	Greg Nazarow	Rail Ops	6	\$79.20	\$47			
1	11	Lan Martin	ReliOps	12	\$76.60	\$91			
1	12	Neil Water	Comens	0	\$73.70				
	13	James Sgro	Commis	0	\$90.00				
ł	14	Theodore Bandy, PE	Sys. Inleg.	47	\$100.00	\$4,70			
21	15	Stephen Barkovich	Sys. Inleg.	30	\$100.00				
	16	Richard Leniz		30		\$1.77			
ł	17	Joseph Bonaduce	Signals Signals		\$81 90	\$90			
ł	18	Aireza Edraki, PE, PMP	Salvry & Sec.	0	\$100.70				
	18					3			
1	19	McEwan van der Mandele, CPP		0	\$77.70	\$			
•	19	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$75.50	3			
			ORT STAFF			-			
۶ŀ	20	Technical Support Staff	Eng. Staff	696	\$50.37	\$35,05			
4	41	Administrative Support Staff HALET & ALURICH	CADY ADMIN	0	\$43.14	3			
ŀ	-			RHEAD RATE	230.34%				
1			ICAL STAFF						
- 4	1	Ed Zaminskie, PE	Lead Geolechnical Eng.	0	\$84,06				
- Þ	2	Project Engineer	Project Engineer	0	\$60.60	5			
t	3	Engineering Staff	Eng Staff	0	\$50.69	5			
ł	4	Junior Engineering Staff	Jr. Eng Staff	0	\$34.99	\$			
ļ	-	SIIPP	ORT STAFF						
	-								
	5	CADO/ Provect Assistant	CADV ADMIN	0		3			
5	-	CADO Project Assistant GRIFFIN ENGINEERING	CADI ADMIN	NHEAD RATE	\$30.30	- 3			
	-	CADO Project Assistant GRIFFIN ENGINEERING	CADV ADMIN			3			

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY				
0.00		NAIK CONSULTING GR		ERHEAD RATE	127.09%					
		TECHNICAL STAFF								
		John Tan, PE	PM	Ō	\$90.56	50				
	2	Rich Baron	SURV PM	0	\$58,30	50				
	_3	Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0				
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0				
		Instrument Technician	SURV Inst. Tech.	0	\$28.62	50				
		Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$				
	7	Senior Ulity Engineer	UTIL Sen. Eng.	0	\$45.79	\$0				
	8	Utility Engineering Statt	UTIL Eng Staff	0	\$37 79	50				
	9	Senior Structural Engineer	STR Sen. Eng.	Ó	\$54,50	50				
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0				
Ψ.		SL	PPORT STAFF							
NAIK	11	CAD Manager	CAD Mgr	0	\$58 19	\$0				
Ž	12	CAD Technicians	CAD Tech	0	\$30.54	\$0 \$0				
100	-	ENVISION	OV	ERHEAD RATE	137.51%					
			HNICAL STAFF							
511		Kurt Buetter	Doc. Ctrl. Mgr	1,370	\$42.00	\$57,540				
z		Thomas Hartley	VE Team Lead	0	\$94.40	\$0				
<u>Q</u>		Configuration Management	Config. Mgmt.	450	\$55.00	\$24,750				
2	4	Value Engineering Team	VETeam	0	\$75.52	\$0				
ENVISION		50								
Ξ	5	Administration	Admin	0	\$21.40	\$0				
	_	JCMS		SHEAD RATE	117.32%					
			HNIGAL STAFF							
JCMS		K. Meehan	Senior Est.	0	\$63.67	\$0				
2	2	Junior Estimator	Junion Est.	0	\$46.20	\$0				
<u>×</u>	3	Project Controls	PC	0	\$57.75					
	-	RADIN		THE ORATE	155.17%					
-			HNICAL STAFF							
RADIN	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0				
2	_	SU								
œ	2	Beth Uczynski	[CAD IV	0	\$38.21	50				
		SJH		ERHEAD RATE	140.00%					
	-		HNICAL STAFF							
		S. Jayakumaran	Civit Eng VIII	0	\$84.24	\$0				
E S	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0				
UŃ	3	Engineering Staff	Eng. Stafi	0	\$40.43	\$0				

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	6,395		
Total Salary			\$477,404
Overhead			\$738,206
Subtotal		-	\$1,215,610
Fixed Fee		10%	\$121,581
Total Direct Costs	S = 1 P -		\$47,863
TOTAL COST			\$1,385,034

			STIMATE BY INDIVIDUA			
TA	SK:			FIRM:		
	2	Risk Management		H&H / GANNE	ETT FLEMING	i JV
P	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR
		HARDESTY & HANOVER		ERHEADRATE	157,40%	and in such
	_		IICAL STAFF			
	1	Visha Szumanski, PE	PM, STR Eng VIII	0	\$96.85	\$
	2	Charlie Geer, PE	Risk Manager	592	\$98.01	\$58.02
	3	David Tuckman, PE	DPM, STR Eng VII	0	\$81.81	\$
I-	4	Steve Harlacker, PE, SE	QAQC, STR Eng VI	0	\$72.32	
	5	Steve Horn, PE	STR Eng VII	0	\$80.39	\$
	8	Peter Roody, PE	STR Eng VIII	0	\$86.51	\$
	7	Michael Hawkins, PE	STR Eng VID	0	\$105.14	\$
	8	Sleve Mikucki, PE	MECH Eng VII	Ó	\$86.43	
	9 10	Alex Noble, PE	ELEC Eng VI	0	\$70.29	
	10	Paul Connolly, PE Glen Schelelich, PE	STR Eng VII	0	\$80.09	\$
	12		STR Eng VIII	0	\$109.79	\$
	12	Raymond Mankbadi, PE Mishac Yeglan, PE, PhD	STR Eng VIII	0	\$86.58	\$
	14	David Marcic, PE, SE	STR Eng Vill STR Eng VI	0	\$76 13	Ś
	15	Jerry DiMaggio.PE	STR Eng VIII	0	\$72.55	
	10	David Gerber, PE	STR Eng VIII	-	\$76,13	\$
	17	Drew DeleDonne, RA	STR Eng VI	0	\$75.63	5
E			ORT STAFF	0	\$69.83	\$
E	18	Support Staff	ISTRI-V	-		
	19	Support Staff	MECHI-V	0	\$46.04	3
	20	Support Staff	ELEC I-V	Ó	\$46.04	\$
		Support Staff	CADY ADMIN	0	\$46.04	\$
-		GANNETT FLEMING		O ERHEAD RATE	37.23	\$
	1			ENNERD RATE	159,17%	
H	1	Richard Cross, PE	ICAL STAFF			
		David Howelt, PE	OPM	0	\$105.40	SI
		Bruce Smith	Rail Sys. Lead Quality Control	0	\$64.70	\$
-		Robert Matthews, PE	Civil Lead	0	\$63.80	-3
		Sleven Zapoliczny, PE	Site/Chril	8	\$79.20	\$63
		Agniesztka Lapinski, PE	Sr. Structural	0	\$72.00	54
		John Legath, PE	Frack	0	\$64.10	SI SI
E	8	Terry Shariz, PE	Cal/ Trans	0	\$99.20	K
		Bryan Shober, PE	Cat/ Trans	0	\$84.30	5
		Greg Nazarow	Rail Ops			
		lan Martin		0	\$79.20	\$4
		Nel Water	Rail Ops Comms	0	\$76.60	\$
	_			0	\$73.70	\$
		James Soro	Comms	0	\$90.00	- SI
		Theodore Bandy, PE Stephen Barkovich	Sys. Integ.		\$100.00	\$800
		Richard Lentz	Sys. Integ.	0	\$59.10	\$0
		Joseph Bonaduca	Signals	0	\$81.90	\$
		Joseph Sonaouce Aireza Edraki, PE, PMP	Signals Safety & Sec.	0	\$100.70	
		McEwan van der Mandele, CPP		0	\$99.60	\$1
		Remesh Rajagopal, PE	Safety & Sec. Hydrautics & Hydrology	0	\$77.70	\$(
H			DRT STAFF	0	\$73.30	\$6
H-	20 1	Technical Support Staff		-		
			Eng. Staff CAD/ ADMIN	0	\$50.37	
1.		HALLEY & ALLURICH		RREADRATE	\$43.14	\$0
	-		ICAL STAFF	IN CAU INTE	4.40,3476	
	1 1	Ed Zeminskie, PE	Lead Geotechnical Eng.	91	\$54.06	
		Project Engineer	Project Engineer	5	\$60.60	\$757
	_	Engineering Staff	Eng Staff			
		Junior Engineering Staff	Jr. Eng Staff	0	\$50.69	
H	-		ORT STAFF	0	224.88	\$0
	5 í	CADD/ Project Assistant	CADY ADMIN	0	\$30,301	
<u> </u>		GRIFFIN ENGINEERING		ERNIEAD RATE	152,30%	50
		men nen in half met andere andere jag gen		and the second s	107.10 10	
H		TECHN	ICAL STAFF			

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY		
110		NAIK CONSULTING GR	00 00	ERHEAD RATE	127.09%			
			CHNICAL STAFF					
		John Tan, PE	IPM .	0	\$90.56	50		
		Rich Baron	SURV PM	Ö	\$58.30	\$0 \$0		
		Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0 \$0		
1.17	- 4	Party Chief	SURV Inst. Tech.	0	\$37.21	\$0		
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0		
1.7	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	50		
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45,79	\$0 \$0		
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0		
	9	Senior Structural Engineer	STR Sen. Eng.	ō	\$54.50	50		
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0		
		SL	JPPORT STAFF		water spin			
NAIK	11	CAD Manager	CAD Mgr	0	\$58 19	\$0		
Z.	12	CAD Technicians	CAD Tech	ō	\$30.54	\$0		
	-	ENVISION	VO	SHEADRANE	137,51%			
	TECHNICAL STAFF							
		Kurt Buettler	Doc. Ctrl. Mor	0	\$42.00	\$0		
z		Thomas Hartley	VE Team Lead	0	\$94.40	\$0		
<u>0</u>	3	Configuration Management	Config. Mgmt.	0	\$55.00	\$0		
2	4	Value Engineering Team	VE Team	0	\$75.52	50		
ENVISION	SUPPORT STAFF							
D	5	Administration	Admin	0	\$21.40	\$0		
	-	JCMS	OVI	ERHERO RATE	117.32%			
	TECHNICAL STAFF							
5	1	K. Meehan	Senior Est.	0	\$63.67	\$0		
JCMS	2	Junior Estimator	Junion Est.	0	\$46.20	\$0		
3	3	Project Controls	PC	o	\$57.75	\$0		
		RADIN	ov	RHEAD RATE	155,17%			
			CHNICAL STAFF					
I≩I	t	Chitra Radin	Disc. Lead	0	\$100.001	\$0		
RADIN	-		JPPORT STAFF					
2	2	Beth Uczynski	ICAD IV	0	\$38,211	\$0		
100	-	SJH	OV	RIEAD RATE	140.00%			
		TEC	CHNICAL STAFF					
	1	S. Jayakumaran	Civil Eng VIII	0	\$84,24	50		
RLS	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0		
6	3	Engineering Staff	Eng. Staff	0	\$40.43	\$0		

TEAM SUMM	RY		
TOTAL ESTIMATED HOURS	622		-
Total Salary			\$60.514
Overhead			\$95,944
Subtotal			\$158,462
Fixed Fee		10%	\$15,640
Total Direct Costs			\$4,340
TOTAL COST			\$176.464

TASK:									
3	and the second sec		FIRM:						
	System Security		H&H / GANN	ETT FLEMING	JV				
NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR				
and the second s	HARDESTY & HANOVER		PRHEAD PATE	187.40%	week to the				
-		VICAL STAFF							
	Maha Szumanski, PE	PM. STR Eng VIII	0		1				
	Charle Geer, PE	Risk Menager	0	\$98.01	1				
	David Tuckman, PE Steve Harlacker, PE, SE	OPM. STR Eng VI	0						
		QAQC, STR Eng VI	0	\$72.32					
	Sleve Hom, PE	STR Eng VII	0	\$80.39					
6	Peter Roody, PE	STR Eng VIII	0	\$85.51					
	Michael Hawkins, PE	STR Eng Vill	0	\$106.14	1				
	Steve Mikucki, PE	MECH Eng VII	0	\$86.43					
	Alex Noble, PE	ELEC Eng VI	0	\$70.29					
11	Paul Connolly, PE Glan Schelelich, PE	STR Eng VI	0	\$60.09					
		STR Eng VIII	0	\$109.79					
12	Raymond Mankbadi, PE	STR Eng Vill	0	\$86.58					
14	Mishec Yegan, PE, PhD David Marcic, PE, SE	STR Eng VNI	0	376.13	1				
15		STR Eng VI	0	\$72.55					
	Jerry Dillaggio PE	STR Eng VIII	0	\$76.13	1				
16	David Gerber, PE	STR Eng VI	0	\$75.63					
17	Drew DelleDonne, RA	STR Eng VI	D	\$89.83	1 1				
-		ORT STAFF		-					
	Support Start	STRIV	0	\$40.04	1				
19	Support Staff	MECH I-V	0	\$48.04	1				
20	Support Staff	ELECIV	0	\$46.04					
21	Support Staff	CAD/ ADMIN	0	\$37.23					
1	GANNETTFLEMING		RHEAD RATE	158.17%	1				
-	TECHNICAL STAFF								
	Richard Cross, PE	DPM	0	\$105,40	1				
2	David Howell, PE	Rad Sys. Lead	0	\$64.70					
	Bruce Smith	Quality Control	0	\$63,80	3				
	Robert Matthews, PE	Cwil Lead	0	\$79.20	5				
5	Sleven Zapoliczny, PE	Site/Civil	0	\$43.70	3				
6	Agniesztka Lapinski, PE	Sr. Structural	0	\$72.00					
7	John Legath, PE	Track	6	\$64.10					
	Terry Shantz, PE	Call Trans	C	\$99,20	3				
	Bryan Shober, PE	Cat/Trans	C	\$84.30	5				
10	Greg Nazarow	Rail Ops	0	\$79.20	1				
	ten Mentin	Rail Opa	0	\$76.60	3				
12	Neil Water	Comms	ć	\$73.70	-				
13	James Sgro	Comms	C	\$90.00	1				
14	Theodore Bandy, PE	Sys. Integ.	0	\$100.00					
	Stephen Barkovich	Sys Integ.	0	\$59.10					
16	Richard Lentz	Signals	4	\$81.90	\$32				
17	Joseph Bonaduce	Signals	0	\$100.70	5				
18	Alireza Edrald, PE, PMP	Safety & Sec.	360	\$99.60	\$35.85				
18	McEwan van der Mandele, CPP		240	\$77.70	\$18,54				
	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30					
-		ORT STAFF		410.00					
20	Technical Support Staff	Eng. Staff	2	\$50.37	\$10				
21	Administrative Support Staff	CAD/ AGAIIN	0	\$43.14	310				
1 1	Administrative Support Staff		RHEAD RATE	220.84%					
_	TECHN	ICAL STAFF	Contraction in state		_				
1 1	Ed Zamnskie, PE	Laad Geolechrycal Eng.	0	\$54,000	-				
	Project Engineer	Project Engineer	0	\$84.06					
	Engineering Staff				3				
		Eng Staff	0	\$50.89	-				
	Junior Engineering Staff	Jr Eng Staff	0	\$34.99	3				
4		ORT STAFF		-					
5.1	CADD/ Project Assistant	CAD/ ADMIN	0	\$30.30	5				
5.1	CADDY Project Assistant GROPPIN ENGINEERONG	CAD/ ADMIN	RHEADTRATE	\$30.30 182.30%					

	NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY			
		NAIK CONSULTING GR	907 90	ERIEAUTATE	127.09%				
	TECHNICAL STAFF								
		John Tan, PE	(PM	0	\$90.56	\$0			
	2	Rich Baron	SURV PM	0	\$58,30	\$0			
	3	Project Surveyor	SURV Proj Surv	0	\$47.50				
	4	Party Chief	SURV Inst. Tech.	0	\$37,21	\$0			
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0			
	6	Ron Rotunno, PE	UTIL Mar	0	\$74.66	\$0			
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45,79	50			
	. 6	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0			
	В.	Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0			
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	50			
-	-	51.	IPPORT STAFF						
NAIK	11	CAD Manager	ICAD Mar	Ō	\$58,19	\$0			
Z	12	CAD Technicians	CAD Tech	0		\$0 \$0			
	-	ENVISION	OV	RHEAD RATE	137,51%				
	TECHNICAL STAFF								
	1	Kurt Buettler	Doc. Ctrl. Mar	Ó	\$42,00	- 10			
z	2	Thomas Hartley	VE Team Load	0	\$94,40	\$0 \$0			
Q	3	Configuration Management	Config. Mornt.	0	\$55.00	50			
S	4	Value Erigineering Team	VE Team	0	\$75.52	\$0			
ENVISION	SUPPORT STAFF								
ti i	-5	Administration	Admin	0	\$21.40	\$0			
	-	JCMS	OV	23/230236	117,3255				
		TES	HNICAL STAFF						
5	1	K. Meehan	Senior Est.	0	\$63 67	- \$0			
JCMS	2	Junior Estimator	Junion Est.	0	\$46.20	50			
181	3	Project Controls	IPC	ő	\$57 75	50			
	-	RADAN	OV	REPORT	155.17%				
	-	TEC	CHNICAL STAFF						
S	1	Chira Radin	Disc. Lead	0	\$100.00	\$0			
9	-	SU	PPORT STAFF						
RADIN	2	Beth Uczynski	ICAD IV	0	\$38,21	\$0			
	-	SJH		RHEAD RATE	140.00%				
	_	TEC	HINICAL STAFF						
	1	S. Jayakumaran	Civil Eng VIII	D	\$84.24	\$0			
E I	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0			
HTS S	3	Engineering Staff	Eng. Staff	0	\$40,43	\$0			
	-			· ·	340,43	30			

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	606	_	
Total Salary			\$54,932
Overhead			\$87,436
Subtotal			\$142,368
Fixed Fee		10%	\$14,237
Total Direct Costs			\$0
TOTAL COST			\$154,605

		STIMATE BY INDIVIDUA			
TASK:			FIRM:		
4.1	Data Collection		H&H / GANN	ETT FLEMING	JV
NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR
-	HARDESTY & HANOVER		SUIPS DIVISION	157,40%	-
		NICAL STAFF			-
	Visha Szumanski, PE	PM, STR Eng Vtll	0	\$96.86	5
2	Charle Geer, PE	Risk Manager	0	\$96.01	
3	David Tuckman, PE	DPM, STR Eng VII	0	\$61.81	3
4	Steve Harlacker, PE, SE	QAQC, STR Eng VI	0	\$72.32	\$
5	Steve Hom, PE	STR Eng VII	0	\$80.39	5
6	Peter Roody, PE	STR Eng Vill	8	\$86.51	\$69
7	Michael Hawkins, PE	STR Eng VIII	8	\$106.14	\$84
8	Steve Milucki, PE	MECH Eng VII	8	\$86.43	\$69
9	Alex Noble, PE	ELEC Eng VI	8	\$70.29	\$56
10	Paul Connolly, PE	STR Eng VII	24	\$80.09	\$1,92
	Glen Schetelich, PE	STR Eng VIII	0	\$109.79	\$
12	Raymond Mankbadi, PE	STR Eng VIII	0	\$86.58	
13	Mishac Yegian, PE, PhD David Marcic, PE, SE	STR Eng VIII	0	\$76.13	
14		STR Eng VI	0	\$72.55	5
	Jerry DiMaggio,PE	STR Eng Vill	0	\$76.13	\$
16	David Gerber, PE	STR Eng VI	0	\$75.63	5
17	Drew DelleDonne, RA	STR Eng VI	0	\$69.83	\$
- 18		ORT STAFF			
18	Support Staff	STRI-V	48	\$46.04	\$2,21
19	Support Staff	MECHI-V		\$46.04	\$1.65
20	Support Staff	ELECIN	32	\$46.04	\$1,47
21	Support Staff	CADY ADMIN	8	\$37.23	\$29
	GANNETT FLEMING		RHEAD RATE	159,17%	
-		HCAL STAFF			
1	Richard Cross, PE	IOPM	0	\$105.40	5
2	David Howel, PE	Rail Sys. Lead	0	\$64.70	\$
3	Bruce Smith	Quality Control	Ō	\$63.60	
4	Robert Matthews, PE	Civil Lead	6	\$79.20	\$63
5	Steven Zapoticzny, PE	Sile/Civil	24	\$43.70	\$1,04
6	Agnieszkka Lapinski, PE	Sr. Structural	12	\$72.00	\$86
7	John Legath, PE	Track	8	\$64.10	\$51
8	Terry Shantz, PE	Call Trans	0	\$99.20	\$
9	Bryan Shober, PE	Cat/ Trans	0	\$54.30	
10	Greg Nazarow	Rail Ops	8	\$79.20	\$63
11	Ian Martin	Rail Ops	12	\$76.60	\$91
12	Net Water	Comms	0	\$73.70	5
13	James Sgro	Comms	40	\$90.00	\$3.60
14	Theodore Bandy, PE	Sys Integ.	4	\$100.00	\$40
15	Stephen Barkovich	Sys. Integ.	30	\$59.10	\$1,77
16	Richard Lentz	Signats	2	\$81.90	\$16
17	Joseph Bonaduce	Signats	ō	\$100.70	\$
18	Alireza Edraki, PE, PMP	Safety & Sec.	0	\$99.60	ŝ
18	McEwan van der Mandele, CPP	Safety & Sec.	0	\$77.70	5
19	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30	
		ORT STAFF		010.00	
20	Technical Support Staff	Eng. Staff	72	\$50 37	\$3.62
21	Administrative Support Staff	CAD/ ADMIN	0	\$43.14	\$
-	HALLEY & ALDRICH		RHEADRATE	220.34%	
	TECHA	HCAL STAFF			
1	Ed Zaminskie, PE	Lead Geolechnical Eng	0	\$84.061	5
$\frac{1}{2}$	Project Engineer	Project Engineer	0	\$60.60	
1 3	Engineering Staff	Eng Staff	0	\$50.69	
	Junior Engineering Staff	Jr. Eng Staff	0	\$34,99	
<u> </u>		ORT STAFF	U	934.89	
1					
	ICADD/ Droject Assistant				
5	CADD/ Project Assistant	CADY ADMIN	0	\$30.30	\$
5	GRUFFIN ENGINEERING		0) RHEAD RATE	\$30.30	5

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY
125		NAIK CONSULTING GR	OOP OV	RHEAD RATE	127.09%	
		TE	CHINICAL STAFF			
	1	John Tan, PE	PM	D	\$90.56	\$0
	2	Rich Baron	SURV PM	0	\$58,30	\$0
	3	Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0
		Party Chief	SURV Inst. Tech.	0	\$37,21	50
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0
	6	Ron Rotunno, PE	UTIL Mar	0	\$74.66	\$0
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45.79	\$0
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0
		Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	50
~	-	\$1	JPPORT STAFF			
NAIK	11	CAD Manager	CAD Mor	0	\$58.19	\$0
2	12	CAD Technicians	CAD Tech	0	\$30,54	\$0
100	-	ENVISION	OVE	RHEAD RATE	137,51%	÷-
	A.C	TE	CHNICAL STAFF			
	1	Kurt Buettler	Doc. Ctrl. Mar	0	\$42.00	\$0
z	2	Thomas Hartley	VE Team Lead	0	\$94.40	50
<u>o</u>	3	Configuration Management	Config. Mgmt.	0	\$55.00	\$0
S I	4	Value Engineering Team	VE Team	0	\$75.52	\$0
ENVISION			JPPORT STAFF			
Ξ	5	Administration	Admin	0	\$21,40	\$0
	(JCMS	OVE	RHEAD RATE	117,32%	
	-		CHINICAL STAFF			*
S	1	K. Meehan	Senior Est.	0	63.67	\$0
JCMS	2	Junior Estimator	Junion Est.	0	\$46,20	\$0
×ι	3	Project Controls	PC	0		\$0
	Court 2	RADIN	OVE	RHEAD RATE	155,17%	-
			CHINICAL STAFF			
₹[1	Chtra Radirs	Disc. Lead	0	\$100.00	\$0
RADIN	-		IPPORT STAFF			
5		Beth Uczynski	CADIN	0	\$38.21	\$0
1	-	SJH	OVE	RHEAD RATE	140.00%	
		TE	CHINICAL STAFF			
		S. Jayakumaran	Civil Eng VIII	0	\$84.24	\$0
HLS.	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0
vố l	3	Engineering Staff	Eng. Staff	Ŏ	\$40.43	

TEAM SUMMARY	*		
TOTAL ESTIMATED HOURS	400		
Total Salary			\$24,531
Overhead			\$38,863
Subtotal			\$63,394
Fixed Fee		10%	\$6,339
Total Direct Costs			\$0
TOTAL COST	11 miles		\$69,733

100			STIMATE BY INDIVIDUA							
TA	SK:	a state of the sta		FIRM:						
	4.2	Survey & Mapping		HEH GANN	ETT FLEMING	JV				
N	ю,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR				
		HARDESTY & HANOVER		ERHEAD RATE	187,40%	Provide Statement				
			NICAL STAFF	_		-				
	1 2	Msha Szumanski, PE	PM. STR Eng Vill	0		5				
	3	Charle Geer, PE David Tuckman, PE	Altsk Manager	0		5				
	3	Steve Harlacker, PE, SE	OPM, STR Eng VII	0		3				
	5	Sleve Hom, PE	QAQC. STR Eng VI	0		5				
	6	Peter Roody, PE	STR Eng Vil			3				
	7	Michael Hawkins, PE	STR Eng Viti	0		\$				
	8	Steve Mikucki, PE	STR Eng VIII MECH Eng VII	0		1				
	9	Alex Noble, PE		0		5				
	0	Paul Connolly, PE	ELEC Eng VI STR Eng VII	0		5				
	11	Gien Scheleich, PE	STR Eng VIII	0	\$109,79					
		Raymond Mankbadi, PE	STR Eng VIII	0		5				
H	13	Minhac Yestan PE PhD	STR Eng VII	0	\$86.58 \$78.13	3				
h	4	Mishac Yeguan, PE, PhD David Marcic, PE, SE	STR Eng VI	0	372.55					
	5	Jerry DiMaggio,PE	STR Eng VII	0	\$78.13	5				
	16	David Gerber, PE	STR Eng VI	0	\$75.63	3				
	7	Drew DelleDonne, RA	STR Eng Vi	0						
-	-		ORT STAFF		aca.u.3					
	8 .	Support Staff	ISTRI-V	0	\$46.04	5				
1	9	Support Staff	MECH I-V	0	\$46.04	3				
12	80	Support Staff	ELEC FV	0	\$48.04					
2	24	Support Staff	CAD/ ADMIN	0	\$37,23					
-	-	GANNETT FLEMING		RHEAD RATE						
	TECHNICAL STAFF									
	1	Richard Cross, PE	OPM	0	\$105.40	5				
	2	David Howell, PE	Rail Sys. Lead	40	364.70	12.58				
	3	Bruce Smith	Quality Control	0	\$63.50	14.00				
	4	Robert Matthews, PE	Civil Laad	0	\$79.20					
	5	Steven Zapoticzny, PL	Ste/Civil	0	343 70	3				
1 1	é	Agnieszska Lapinski, PE	Sr Structural	0	\$72.00					
		John Legath, PE	Track	Č	364 10	5				
	8	Terry Shaniz, PE	Call/Trans	0	\$199.20					
	9	Bryan Shober, PE	Call Trans	0	\$84,30	5				
1	0	Greg Nazarow	Rail Ops	0	\$79,20	3				
1		lan Martin	Rail Ops	0	\$76.60					
		Nell Walter	Commis	0	\$73.70	š				
1	3	James 5gro	Comma	0	\$90.00	5				
		Theodore Bandy, PE	Sys Integ	0	\$100.00	5				
1		Stephen Barkovich	Sys. Integ.	48	\$59.10	\$2.83				
1		Richard Lentz	Signals	0	\$81.90	42.00				
1		Jeseph Bonaduce	Signals	0	\$100,70					
		Aliraza Edraki, PE, PMP	Salety & Sec.	0	\$99.60	1				
1	8	McEwan van der Mandele. CPP	Safety & Sec.	0	\$77 70	5				
1	9	Ramesti Rajagopal, PE	Hydraulics & Hydrology	0	\$75,300	1				
1 21		SUPP	ORT STAFF							
2	0	Technical Support Staff	Eng. Staff	80	\$50.37	\$4.03				
2	1	Administrative Support Staff	CAD/ ADMIN	0	\$43.14	34				
1.00	-	HALET & ALDRICH		PINEAD RATE	220.94%	1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-				
	-		HCAL STAFF			1				
		Ed Zaminskie, PE	Lead Geolechnical Eng.	0	\$84.06	5				
2		Project Engineer	Project Engineer	0	\$60.60	30				
3		Engineering Staff	Eng Staff	C	\$50.69	\$(
		Junior Engineering Staff	Jr. Eng Staff	0	\$34.90	\$4				
-	_	SUPP	ORT STAFF		and the second					
3		CADD/ Project Assessmi	CADY ADMIN	0		5				
		GRIFFIN ENGINEERING	OVE	RHEAD RATE	181.30%	-				
			ICAL STAFF							
-	_	Joe Griffin, PE	Const. Rev.		\$90.00					

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY
-	-	NAIK CONSULTING GR	00P 0V	ERHEAD RATE	127.09%	
	-	TE	CHNICAL STAFF			
	1	John Tan, PE	PM	20	\$90.56	\$1.811
	2	Rich Baron	SURV PM	20	\$58.30	\$1,166
	3	Project Surveyor	SURV Proj. Surv.	40	\$47.50	\$1,900
		Party Chief	SURV Inst. Tech.	208	\$37,21	\$7 740
	5	Instrument Technician	SURV Inst. Tech.	208	\$28.62	\$5,953
	6	Ron Rolunno, PE	UTIL Mgr	0	\$74.66	\$0
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45.79	\$0
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37 79	\$0
	9	Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0
~	-		IPPORT STAFF			
NAIK	11	CAD Manager	CAD Mgr	10	\$58,19	\$582
Z	12	CAD Technicians	CAD Tech	200	\$30.54	\$6,108
11.0	-	ENVISION		ERHEAD RATE	137.51%	
			CHNICAL STAFF			_
	1	Kurt Buettler	Doc. Ctrl. Mgr	0	\$42.00	\$0
2	_2	Thomas Hartley	VE Team Lead	0	\$94.40	\$0
2	3	Configuration Management	Config. Mgmt.	Ó	\$55.00	\$0
12	4	Value Engineering Team	VE Team	0	\$75.52	\$0
ENVISION			IPPORT STAFF			
Ψ	5	Administration	Admin	0	\$21.40	\$0
	-	JCMS		ERHEADRATE	117.32%	
101			CHINICAL STAFF			
9		K. Meehan	Senior Est.	0	\$63.67	\$0
JCMS	2	Junior Estimator	Junion Est.	0	\$46.20	\$0
ĽŠ.	3	Project Controls	IPC	0	\$57,75	\$0
0.1		RADIN	OV	ERHEADRATE	156.17%	
	-		HNICAL STAFF			
릁	1	Chitra Raden	Disc. Lead	0	\$100.00	\$0
RADIN			PPORT STAFF			
2	2	Beth Uczynski	CAD IV	0	\$38.21	\$0
	-	SJH	OV	RHEAD RATE	140.00%	
			CHNICAL STAFF			
0.	1	S Jayakumaran	Civil Eng VIII	0	\$84,24	\$0
HLS	2	Senior Engineering Staff	Sen. Eng Staff	Ö	\$59.58	\$0
vi l	3	Engineering Staff	Eng Staff	ő	\$40.43	\$0

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	874		-
Total Salary			\$34,714
Overhead			\$47,151
Subtotal			\$81,565
Fixed Fee		10%	\$8,187
Total Direct Costs			\$191,720
TOTAL COST			\$281,772

- 11		E	STIMATE BY INDIVIDUA			
- 11	rask:			FIRM:		
L	4.3	ROW Research		H&H / GANNE	ETT FLEMING	VL
	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR
	2	HARDESTY & HANOVER		ERITEAD RATE	157,40%	-
Ŀ	_		VICAL STAFF			
L.	1	Visha Szumanski, PE	IPM. STR Eng VIII	0	\$96.86	\$
Ŀ	2	Charle Geer, PE	Risk Manager	0	\$95.01	
ŀ	5	David Tuckman, PE	DPM, STR Eng VII	0	\$81.81	
Ŀ	4	Steve Harlacker, PE, SE	QAQC, STR Eng VI	0	\$72.32	ŝ
ŀ	5	Steve Hom, PE	STR Eng Vil	0	\$80.39	\$
Ŀ	6	Peter Roody, PE	STR Eng Vill	0	\$86.51	\$
Ŀ	7	Michael Hawkins, PE	STR Eng VIII	0	\$106.14	\$
ŀ	8	Sleve Mikucki, PE	MECH Eng VII	0	\$86.43	\$
ŀ	9	Alex Noble, PE	ELEC Eng VI	0	\$70.29	\$
H		Paul Connolly, PE	STR Eng VII	0	\$80.09	\$
Ŀ	11	Gien Schetelich, PE	STR Eng VIII	0	\$109.79	5
Ŀ	12	Raymond Mankbadt, PE	STR Eng VIII	0	\$86,58	\$
┢	13	Mishac Yegian, PE, PhD David Marcic, PE, SE	STR Eng Vill	0	\$76.13	\$
┣	14	Jerry DiMaggio,PE	STR Eng VI	0	\$72.55	\$
F			STR Eng Vilt	0	\$76.13	\$
┣	16	David Gerber, PE	STR Eng VI	0	\$75.63	\$
ŀ	17 .	Drew DelleDonne, RA	STR Eng VI	0	\$69.63	\$
F	-		ORT STAFF			
Ŀ		Support Staff	STRIV	0	\$46.04	\$
Ŀ	19	Support Staff	MECHIV	0	\$46.04	3
1-	20	Support Staff	ELEC I-V	0	\$46.04	\$
4	21	Support Staff	CAD/ ADMIN	0	\$37.23	ŝ
L.	-	GANNETTPLEMING		RHEAD RATE	159.17%	
L,	_		ICAL STAFF			
L	1	Richard Cross, PE	DPM	0	\$105.40	5
L		David Howell, PE	Rail Sys. Lead	-0	\$64.70	5
L		Bruce Smith	Quality Control	0	\$63.60	SI
Ŀ		Robert Matthews, PE	Civil Lead	0	\$79.20	\$
L		Steven Zapoliczny, PE	Sile/Civil	D	\$43.70	\$4
L		Agnieszkka Lapinski, PE	Sr. Structural	-0	\$72.00	
L	7	John Legath, PE	Track	0	\$64.10	\$(
L		Terry Shantz, PE	Cal/ Trans	0	\$99.20	S.
E		Bryan Shober, PE	Cal/ Trans	0	\$84.30	54
L		Greg Nazarow	Rail Ops	Ö	\$79.20	\$4
L		tan Martin	Rail Ops	0	\$78,60	\$
L		Net Water	Comma	0	\$73.70	\$4
Ľ	13	James Sgro	Comma	0	\$90.00	5
E		Theodore Bandy, PE	Sys. Integ	0	\$100.00	S
E		Stephen Barkovich	Sys. Integ.	12	\$59.10	\$70
Ľ		Richard Lentz	Signats	0	\$81.90	54
Ľ		Joseph Bonaduce	Signals	0	\$100.70	50
Г	18	Akreza Edraki, PE, PMP	Salety & Sec.	0	\$99.60	5
Г	10	McEwan van der Mandele, CPP	Safety & Sec.	0	\$77.70	S
Г	19	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30	
Г		SUPP	DRT STAFF			
Г		Technical Support Staff	Eng. Staff	OÍ	\$50.37	
Г	21	Administrative Support Staff	CAD/ ADMIN	0	\$43.14	\$4
	-	HALLEY & ALDRICH	OVE	RHEAD RATE	220.84%	
Г			ICAL STAFF			
	1	Ed Zaminskie, PE	Lead Geolechnical Eng.	0	\$84.061	50
Г	2	Project Engineer	Project Engineer	0	\$80.60	\$0
F		Engineering Staff	Eng Staff	0	\$50.69	
F	3 1	Junior Engineering Staff	Jr. Eng Staff	0	\$34,99	
F	_	ANNUAL CINERPORT RIG CARL				
	_			-		
	4	SUPP	DRT STAFF		\$30.504	
	4	SUPP	DRT STAFF CADY ADMIN		\$30.30	50
	4	SUPP CADD/ Project Assistant GRIFFIN ENGINEERING	DRT STAFF CADY ADMIN	0] RHEAD RATE	\$30.30j 152.30%	\$0

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY
173	perfection.	NAIK CONSULTING GR	00P 0V	ERHEAD RATE	127.09%	
		TE	CHNICAL STAFF			
	1	John Tan, PE	PM	16	\$90.56	\$1,449
	2	Rich Baron	SURV PM	30	\$58,30	
		Project Surveyor	SURV Proj. Surv	60	\$47.50	\$2,850
	4	Party Cluef	SURV Inst. Tech.	60	\$37,21	\$2,233
	5	Instrument Technician	SURV Inst. Tech.	60	\$28.62	\$1717
	6	Ron Rotunno, PE	UTIL Mar	0	\$74.66	\$0
	7	Senior Ullity Engineer	UTIL Sen. Eng.	0	\$45.79	\$0
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0
	9	Senior Structural Engineer	STR Sen. Eng.	0	\$54,50	50
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0
4			IPPORT STAFF			
NAIK		CAD Manager	CAD Mgr	B	\$58,19	\$466
Z	12	CAD Technicians	CAD Tech	66	\$30.54	\$2,016
623		ENVISION	OV	SRIEAD RATE	137.51%	
11	-		CHINICAL STAFF			-
		Kurt Buettler	Doc. Ctrt. Mgr	0	\$42.00	\$0
z		Thomas Haritey	VE Team Lead	0	\$94.40	\$0
<u>Q</u>		Configuration Management	Config. Mgmt.	0	\$55.00	\$0
្ទ	- 4	Value Engineering Team	VE Team	0	\$75.52	\$0
ENVISION			IPPORT STÄFF			
W	5	Administration	Admin	0	\$21.40	\$0
		JCMS		RHEAD RATE	117.32%	
			CHNICAL STAFF			
2	1	K. Meehan	Senior Est.	0	\$63.67	\$0
JCMS	2	Junior Estimator	Junion Est.	0.	\$46.20	\$0
¥.	_ 3	Project Controls	(PC	0	\$57.75	\$0
100	C-seller.	RADIN	OV	ERHEAD RATE	155,17%	
	c		HINICAL STAFF			
I S I	_1	Chitra Radin	Disc. Lead	0	\$100.00	\$0
RADIN			PPORT STAFF			
62	2	Beth Uczynski	CADIN	0	\$38.21	\$0
111		SJH		RHEAD RATE	140.00%	
	-		CHINICAL STAFF			
	1	S. Jayakumaran	Civil Eng VIII	0	\$84.24	\$0
H	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0
vi	3	Engineering Staff	Eng Staff	0.	\$40.43	\$0

TEAM SUMMA	RY		
TOTAL ESTIMATED HOURS	312		
Total Salary			\$13,168
Overhead			\$16,988
Subtotal			\$30,176
Fixed Fee		10%	\$3,018
Total Direct Costs			\$0
TOTAL COST			\$33,194

TASK		STIMATE BY INDIVIDUA	FIRM:						
-	4 Utility Investigation	1		ETT FLEMING	JV				
NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR				
-	HARDESTY & HANOVER		CHIPHERED PLATE	187,40%	from the second				
		NICAL STAFF							
1 2	Visha Szumanski, PE	PM. STR Eng Vill	0	\$96 86					
3	Charle Geer, PE	Risk Manager	0	\$98.01					
3	Devid Tuckman, PE Steve Hartacker, PE, SE	DPM, STR Eng VII	0	\$81.81					
5	Steve Hom, PE	QAOC. STR Eng VI	0	172.32	· · · · · · · · · · · · · · · · · · ·				
6	Peter Roody, PE	STR Eng VII	0	\$50.35					
7	Michael Hawkins, PE	STR Eng VIII	0	\$86.51	1				
8	Steve Mikucki, PE	STR Eng VIII	0	\$106.14	-				
9	Alex Noble, PE	MECH Eng VII	0	\$86.43					
10	Paul Connolly, PE	ELEC Eng VI	0	\$70.29					
11	Gien Schetelich, PE	STR Eng Vili	0	\$30.09					
12	Revmond Mankbadi PE	STR Eng VII		109.79					
12	Mistac Yanan PE OhD	STR Eng VIII STR Eng VIII	0	\$00.50					
14	Mishac Yeglen, PE, PhD David Marcic, PE, SE	STR Eng VI	0	\$76.13					
15	Jerry DiMaggio PE	STR Eng Vil		\$72.55					
16	David Gerber, PE		0	\$76.13					
17	Drew DeleDonne, RA	STR Eng VI	0	\$75.63					
10		PORT STAFF	0	\$59.83					
-18	Support Staff	ISTR I-V			_				
19	Support Staff	MECHIV	0	\$49.04	-				
20	Support Staff	ELECI-V	0	\$48.04					
21	Support Suff	CADY ADMIN	0	\$46.04 \$37.23					
	GANNETTFLEMING								
GANNETT FLEMING OVERHEAD RATE 168.17%									
4 Mildered Overs OF Marks									
2	Cavit Howell, Pf		0						
4	Bruce Emilti	Rail Sys. Lead	0	\$64.70					
	Robert Matthews, PE	Quality Control	0	\$453.80					
- 5	Steven Zapobczny, PE	Civil Lead Sile/Civil	0	\$79.20					
8	Agniniszkia Lapinski, PE		0	\$43.70					
	Linke Landit DP	Si Structural	0	\$72.00					
7	John Legath, PE	Track	0	\$84.10					
7	John Legath, PE Terry Shaniz, PE	Track Cat/Trans	0	\$84.10 349.20					
7 8 9	John Legath, PE Terry Shaniz, PE Bryan Shober, PE	Track Call/Trans Call/Trans	0	\$84.10 \$46.20 \$84.00	\$1.0				
7 5 9 10	John Legath, PE Terry Sharitz, PE Bryan Shober, PE Greg Nazarow	Track Cat/ Trans Cat/ Trans Rail Ops	0 0 12 0	\$64.10 \$49.20 \$84.30 \$79.20	\$1.5				
7 8 9 10 11	John Legath, PE Terry Shaniz, PE Bryan Shober, PE Greg Nazarow Ian Martin	Track Catl Trans Catl Trans Rail Ops Rail Ops	0 0 12 0	\$64.10 \$89.20 \$84.30 \$79.20 \$76.60	\$1.0				
7 8 10 11 12	John Legath, PE Terry Shantz, PE Bryan Shober, PE Greg Nazarow Ian Mettin Nei Water	Track Call Trans Call Trans Rail Ops Rail Ops Comms	0 12 0 0	\$64.10 369.20 \$84.30 \$79.20 \$76.60 \$73.70	\$1.0				
7 8 9 10 11 12 13	John Legah. PE Teny Shantz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Nes Water James Syro	Track Call Trans Call Trans Rail Ops Rail Ops Comms Comm Comm	0 12 0 0 0 0	\$64,10 346,20 \$84,30 \$79,20 \$76,60 \$73,70 \$90,00	\$1.0				
7 8 9 10 11 12 13 14	John Legath, PE Terry Slantz, PE Bryan Shober, PE Greg Nazarow Tan Martin Neti Water James Sgro Theodore Bandy, PE	Track Carl Trans Carl Trans Rail Ops Rail Ops Comms Comms Sys Integ.	0 12 0 0 0 0 0 0	\$64.10 \$49.20 \$84.30 \$79.20 \$76.60 \$73.70 \$90.00 \$100.00	\$1.0				
7 8 9 10 11 12 13 14 15	Admin Legath: PE Terry Silandz, PE Bryan Shoher, PE Greg Nazarow Ian Martin Heel Walter James Sgro Theodore Bandy, PE Silephen Bankovich	Track Cair Trans Cair Trans Rair Ops Comms Comms Sys Integ. Dys. Integ.	0 0 12 0 0 0 0 0 20	\$84.10 \$89.20 \$84.30 \$79.20 \$78.60 \$73.70 \$90.00 \$100.00 \$59.10	\$1.0 51.0				
7 8 9 10 11 12 13 14 15 16	John Legah. PE Terry Slantz, PE Bryan Shoker. PE Greg Nazarow Ian Martin Nei Waller James Sgro Theodore Bandy, PE Stephen Bankovich Filchard Lentz	Track Carl Trans Carl Trans Carl Trans Rai Ops Comms Comms Sys Integ Sys Integ Sys Integ Sys Integ Sys Integ	0 12 0 0 0 0 0 20 0 0 0 0 0 0 0 0 0 0 0	\$84.10 \$89.20 \$84.00 \$79.20 \$78.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90	\$1,0 51,12				
7 8 9 10 11 12 13 14 15 16 17	Admin Legath: PE Teny Silandz, PE Bryan Shoder, PE Greg Nazarow Ian Martin Piel Water James Sgro Theodore Bandy, PE Stephen Bandy, PE Stephen Bandy, PE Stephen Bandy, Charl	Track Cat/Trans Cat/Trans Cat/Trans Rai/Ops Rai/Ops Comms Comms Sys_Integ Sy	0 0 12 0 0 0 0 20 0 0 0 0 0 0	\$84.10 \$89.20 \$84.30 \$79.20 \$76.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90 \$100.70	\$1,0 51,10				
7 5 10 11 12 13 14 15 16 17 18	John Legah. PE Teny Silantz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Neel Waiter James Sgro Theodore Bandy, PE Silephen Barkovich Richard Lentz Joseph Bonaduce Almiza Edmäis, PE, PMP	Track Cair Trans Cair Trans Cair Trans Rai Ops Comms Comms Comms Sys_Integ Sys_Integ Signals Signals Signals Signals Signals	0 12 0 0 0 0 0 20 0 0 0 0 0 0 0 0 0 0 0	\$84.10 388.20 \$84.30 \$79.20 \$76.60 \$73.70 \$90.00 \$100.00 \$100.00 \$59.10 \$81.90 \$100.70 \$81.90 \$100.70	\$4,0				
7 8 9 10 11 12 13 14 15 16 17 18 18	John Legah. PE Terry Slantz, PE Bryan Shoker. PE Greg Nazarow Ian Martin Net Water James Sgro Theodoxe Bandy, PE Stephen Barkovich Filchard Lentz Joseph Bonaduce Alreuz Ednali, PE, PMP MeEwan van der Mandele, CPP	Track Carl Trans Carl Trans Carl Trans Rai Ops Comms Comms Comms Sys Integ Sys Integ Sys Integ Signals	0 0 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84.10 346.20 \$84.30 \$79.20 \$76.60 \$73.70 \$90.00 \$100.00 \$59.10 \$89.90 \$100.70 \$99.60 \$199.60 \$100.77 \$99.60 \$77.70	\$100 3100 3100 3100 3100 3100 3100 3100				
7 5 10 11 12 13 14 15 16 17 18	Aven Legate. PE Terry STantz, PE Bryan Shoter, PE Greg Nazarow Ian Martin Piel Water James Sgro Theodore Bandy, PE Stephen Bandy, PE Stephen Bandy, PE Stephen Bandy, PE Stephen Bandy, PE Maser Van der Mandele, CPP Martesh Rajagopat, PE	Track Call Trans Call Trans Call Trans Rail Ops Comms Comms Syn Integ. Dys. Integ. Syn Integ. Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec.	0 12 0 0 0 0 0 20 0 0 0 0 0 0 0 0 0 0 0	\$84.10 388.20 \$84.30 \$79.20 \$76.60 \$73.70 \$90.00 \$100.00 \$100.00 \$59.10 \$81.90 \$100.70 \$81.90 \$100.70	\$100 3100 3100 3100 3100 3100 3100 3100				
7 8 10 11 12 13 14 15 16 17 18 18 18 19	John Legah. PE Teny Silantz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Neel Water James Sgro Theodore Bandy, PE Stephen Bankovich Richard Lentz Joseph Bonaduce Almuza Edmäi, PE, PMP MeEwan van der Mandele, CPP Ramesh Rajagopat, PE SUPP	Track Cail Trans Cail Trans Cail Trans Cail Trans Rail Ops Comms Comms Sys. Integ. Sys. Integ. Signals Signals Signals Signals Signals Satety & Sec. Satety & Sec. Hydraukcs & Hydrology OHT STAFF	0 0 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84.10 346.20 \$84.30 \$79.20 \$76.60 \$73.70 \$90.00 \$100.00 \$59.10 \$89.90 \$100.70 \$99.60 \$199.60 \$100.77 \$99.60 \$77.70	\$1.0				
7 8 10 11 12 13 14 15 16 17 18 18 19 20	Aven Legah. PE Terry Silardz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Piel Water James Sgro Theodore Bandy, PE Stephen Bandy, PE Stephen Bandy, PE Stephen Bandy, PE McEwan van der Mandele, CPP Ramesh Rasgopat, PE SUPP Technical Groom Stoff	Track Call Trans Call Trans Call Trans Rai Ops Comms Comms Comms Sys Integ Sys Integ Sys Integ Signals Signals Signals Signals Signals Signals Calefy & Sec. Safety & Sec. Hydraulics & Hydrology ORT STAFF Eng Staff	0 3 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84 10 348 20 \$55.30 \$73.70 \$73.70 \$80.00 \$100.00 \$59.10 \$59.10 \$100.70 \$95.60 \$77.70 \$73.30 \$77.70	\$1.0 5 5 5 1.12 5 5 1.12 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5				
7 8 10 11 12 13 14 15 16 17 18 18 18 19	Aven Legah. PE Terry Silardz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Piel Water James Sgro Theodore Bandy, PE Stephen Bandy, PE Stephen Bandy, PE Stephen Bandy, PE McEwan van der Mandele, CPP Ramesh Rasgopat, PE SUPP Technical Groom Stoff	Track Call Trans Call Trans Call Trans Rail Ops Comms Comms Sys Integ. Sys. Integ. Sys. Integ. Sys. Integ. Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Eng Staff CADY ADMIN		\$64 10 14/9 20 \$76.60 \$77.20 \$76.60 \$100.00 \$100.00 \$100.00 \$59.10 \$319.00 \$100.70 \$10	\$100 3100 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3				
7 8 10 11 12 13 14 15 16 17 18 18 19 20	Admin Legath: PE Terry Silantz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Neel Water James Sgro Theodore Bandy, PE Silophen Barkovich Richard Lentz Joseph Bonaduce Almraz Edmäi, PE, PMP MeEwan van der Mandele, CPP Ramesh Rajagopat, PE SUPP Technical Euspont Staff Administrative Support Staff	Track Cail Trans Cail Trans Cail Trans Cail Trans Rail Ops Comms Comms Comms Sys. Integ. Bignats Signats Signa	0 3 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84 10 348 20 \$55.30 \$73.70 \$73.70 \$50.00 \$100.00 \$59.10 \$59.10 \$100.70 \$95.60 \$77.70 \$73.30 \$77.70	34,0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3				
7 8 10 11 12 13 14 15 16 17 18 18 19 20	John Legah. PE Terry Slantz, PE Bryan Shoker. PE Greg Nazarow Ian Martin Neal Waller James Sgro Theodore Bandy, PE James Sgro Theodore Bandy, PE Stephen Barkovich Pikhard Lentz Joseph Bonaduce Almiza Ednak, PE, PMP McEwan van der Mandele, CPP Ramesh Rejagopal, PE SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH	Track Call Trans Call Trans Call Trans Rai Ops Comms Comms Comms Sys Integ Sys Integ Sys Integ Signals Signals Signals Signals Signals Call X Sec. Hydraulics & Hydrology ORT STAFF Eng Staff CAD ADMIN OVE ICAL STAFF	0 3 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84 10 348 20 \$54.00 \$79.20 \$78.60 \$73.70 \$90.00 \$59.10 \$59.10 \$59.10 \$100.70 \$99.60 \$77.70 \$73.30 \$77.70 \$73.30 \$50.37 \$43.14 \$20,945	34,0 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3				
7 8 9 10 11 12 13 14 15 16 17 18 18 18 19 20 21	Liven Legati. PE Terry Silardz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Neel Water James Sgno Theodore Bandy, PE Silophen Bankovich Richard Leniz Joneph Bonaduce Almizz Ednala, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopat, PE SUPP Technical Support Staff HALEY & ALDRICH TECH9 Ed Zaminakie, PE	Track Call Trans Call Trans Call Trans Rail Ops Comms Ops Comms Ops Integ Sys Integ Sys Integ Sys Integ Sys Integ Safety & Sec. Betty & Sec. Betty & Sec. Betty & Sec. CADY ADMIN OVE ICAL STAFF Lend Godechnical Eng.	0 3 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	844 10 1419 20 \$449 20 \$449 20 \$476 60 \$77 20 \$77 20 \$76 60 \$77 70 \$59 100 \$100,00 \$59 10 \$59 50 \$77 30 \$77 30 \$77 30 \$73 30 \$74 30 \$74 30 \$75 40 \$77 30 \$74 30 \$74 30 \$75 40 \$75 40 \$77 30 \$75 30 \$75 40 \$76 40 \$76 40 \$77 30 \$76 40 \$40 50 \$77 30 \$40 30 \$40 30 \$40 50 \$77 30 \$40 40 \$40 40	\$1.0 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5				
7 8 9 10 11 12 12 13 14 15 16 17 18 18 19 20 21 1 2	John Legah. PE Teny Slantz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Neel Walter James Sgro Theodore Bandy, PE Stephen Barkovich Richard Lentz Joseph Bonaduce Almruz Erinaki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopat, PE SUPP Technical Euspont Staff Administrative Support Staff Administrative Support Staff MALEY & ALLINCKH TECHNICH Ed Zaminiske, PE	Track Call Trans Call Trans Call Trans Call Trans Rail Ops Comms Comms Comms Comms Sys. Integ. Bignats Signats	0 3 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84 10 348 20 \$54.00 \$79.20 \$78.60 \$73.70 \$90.00 \$59.10 \$59.10 \$59.10 \$100.70 \$99.60 \$77.70 \$73.30 \$77.70 \$73.30 \$50.37 \$43.14 \$20,945	\$1.0 51.12				
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	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS		TOTAL SALARY
	_	NAIR CONSULTING GR		RHEAD RATE	127.09%	
			CHNICAL STÀFF			
11	1	John Tan, PE	PM	20	\$90.56	\$1,811
	2	Rich Baron	SURV PM	0	\$58.30	\$0
		Project Surveyor	SURV Pro Surv.	0	\$47.50	\$0
	4	Party Chief	SURV Inst. Tech.	Ö	\$37.21	\$0
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	50
	6	Ron Rolunno, PE	UTIL Mgr	16	\$74,66	\$1,195
	7	Senior Uility Engineer	UTIL Sen. Eng	60	\$45.79	\$2,747
	8	Utility Engineering Staff	UTIL Eng Staff	140	\$37.79	\$5,291
	9	Senior Structural Engineer	STR Sen Eng.	0	\$54.50	\$0
	10	Structural Engineering Staff	STR Eng Staff	-0	\$29.22	\$0
4		84	JPPORT STAFF			
NAIK	tt	CÁD Manager	CAD Mor	14	\$58,19	\$815
Z	12	CAD Technicians	CAD Tech	100	\$30.54	\$3 054
		ENVISION	OV	RHEAD RATE	137.51%	
		TE	CHINICAL STAFF			
	1	Kurt Buetlier	Doc. Ctrl. Mgr	0	\$42.00	\$0
2	2	Thomas Hartley	VE Team Lead	ŏ	\$94,40	\$0
Ō	3	Configuration Management	Config. Marril.	0	\$55.00	\$0
S	4	Value Engineering Team	VE Team		\$75.52	\$0
ENVISION		SI	JPPORT STAFF			
	5	Administration	Admin	0	\$21.40	\$0
	-	JUMS	OV	READEALE	117.32%	
		TE	CHNICAL STAFF			
5	1	K. Meehan	Senior Est.	0	\$63 67	\$0
똜	2	Junior Estimator	Junion Est.	0	\$46,20	\$0
JCMS	3	Project Controls	PC		\$57 75	\$0
		RADIN	OV	RHEAD RATE	155.17%	
		TE	CHNICAL STAFF			
2	1	Chira Radin	Disc, Lead	01	\$100.001	\$0
RADIN	-	SI.	PPORT STAFF		0100.00	
2	2	Beth Uczynski	ICAD IV	DI	\$38.21	\$0
100	1	SJH	OVE	RHEAD RATE	140.00%	
		TE	CHNICAL STAFF		140.00 /4	
	1	S Javakumaran	Civil Eng VIII	0	\$84,24	50
#	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	50
Η̈́S	3	Engineering Staff	Eng. Staff	0	\$40.43	
	_	and the second second	terration and the second se	V	340,43	\$0

TEAM SUMMARY			
TOTAL ESTIMATED HOURS	342		
Total Salary		1	\$17,106
Overhead			\$22,444
Subtotal		-	\$39,550
Fixed Fee		10%	\$3,955
Total Direct Costs			50
TOTAL COST			\$43,505

	TASK:		STIMATE BY INDIVIDUA	FIRM:		_			
		Geotech Investigation		HAH / GANN	ETT FLEMING	vL			
	ND,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE				
1	_	HARDESTY & HANOVER	VICAL STAFF	ERHEAD RATE	157,40%				
ł	1	Mana Szumanski, PE	PM, STR Eng VIII	0	400.00	_			
ł	2	Charle Geer, PE	Risk Manager	0	\$96.65	-			
ł	3	David Tuckman, PE	OPM, STR Eng VII	0	\$81,81	-			
ł	4	Steve Harlacker, PE. SE	GAOC, STR Eng VI	0	\$72.32	-			
f	5	Steve Hom, PE	STR Eng VII	0	\$80.39	-			
t	6	Peter Abody, PE	STR Eng VIII	0	\$86.51	1			
t	7	Michael Hawkins, PE	STR Eng VIII	0	\$106.14	-			
t	8	Steve Mikucki, PE	MECH Eng VII	0	\$85.43	-			
ł	9	Alex Noble, PE	ELEC Eng VI	0	\$70.29				
ľ	10	Paul Connolly, PE	STR Eng VII	0	\$00.09				
l	11	Gien Schelelich, PE	STR Eng VIII	0	\$109.79				
I	12	Raymond Mankbadi, PE	STR Eng VIII	80	\$86.58	\$8.92			
ſ	13	Mishac Yegian, PE, PhD David Marcic, PE, SE	STR Eng Vill	0	\$75.13				
ſ	14	David Marcic, PE, SE	STR Eng VI	0	\$72.55				
ſ	15	Jerry DiMaggio PE	STR Eng VII	0	\$70.13	1			
I	16	David Gerber, PE	STR Eng VI	0	\$75.63				
I	- 17	Drew DeteDonne, RA	STR Eng VI	0	\$69.83				
I			ORT STAFF		1000				
I	18	Support Staff	STR I-V	320	\$45.04	\$14,73			
l	19	Support Staff	MECHIN	0	\$46.04				
Į	20	Support Staff	ÉLEC I-V	0	\$46.04				
1	21	Support Staff	CAD' ADMIN	0	\$37.23				
I	GANNETT FLEMING OVERHEAD RATE 151.17%								
ł	1		IICAL STAFF		_	101 C			
ł	1	Richard Cross, PE	OPM	0	\$105.40				
ł	2	David Howell, PE Bruce Smith	Rei Sys. Lead	0	\$64.70				
ł	4	Robert Methows, PE	Quality Control	0	\$63.80				
ŀ	5	Steven Zapoticzny, PE	Civil Lead Sile/Civil	0	\$79.20	1			
ł	8	Agniesztika Lapinski, PE	SterCivil Sr. Structural	0	\$43.70				
ł		John Legath. PE	Track	0	\$72.00				
ł	8	Terry Shantz, PE	Call Trans	0	399.20				
ł	9	Bryan Shober, PE	Cat/ Trans	D	\$54.30				
ł	10	Gree Nazarow	Rail Ops	0	\$79.20				
	11	lan Martin	Rail Ops	0	\$79.20	-			
ł	12	Net Water	Comma	0	\$73.70				
ŀ					#ra.ru				
ŀ	13				200.00				
		James 5gro	Comma	0	\$90.00				
	13	James Sgro Theodore Bandy, PE	Comms Bys. Integ.	0	\$100.00				
	13 14	James 5gro	Comma Bys Integ. Sys. Integ.	0		\$70			
	13 14 15	James Sgro Theodore Bandy, PE Stephen Barkovich	Comms Bys. Integ. Sys. Integ. Signals	0	\$100.00 \$59.10 \$81.90	\$70			
	13 14 15 18	James Sgro Theodora Bankly, PE Stephen Barkovich. Richard Lentz Joseph Bonsduce Akraza Edraki, PE, PMP	Comms Bys Integ. Sys. Integ. Signate Signate Signate Signate Signate	0	\$100.00 \$59.10	\$70			
	13 14 15 16 17	James Sgro Theodora Bankly, PE Stephen Barkovich. Richard Lentz Joseph Bonsduce Akraza Edraki, PE, PMP	Comms Bys Integ. Sys. Integ. Signate Signate Signate Signate Signate	0 12 0 0 0	\$100.00 \$59.10 \$81.90 \$100.70 \$99.60	\$70			
	13 14 15 18 17 18	James Sgro Theodore Bankly, PE Stephen Bankovich Richard Lentz Joseph Bonsduce	Comms Bys Integ. Sys. Integ. Signate Signate Signate Signate Signate	0	\$100.00 \$59.10 \$81.90 \$100.70	\$70			
	13 14 15 18 17 18 18	James Sgro Theodore Bankly, PE Stephen Bankovich. Richard Leniz Joseph Bonsduce Alrezz Ednal, PE, MAP McEwan van der Mandele, CPP Rameah Rajagopal, PE	Comma Gys. Integ. Sys. Integ. Signate Signate Safety & Sec. Safety & Sec.	0 0 12 0 0 0 0	\$100.00 \$59.10 \$81.90 \$100.70 \$99.60 \$77.70	\$70			
	13 14 15 16 17 18 18 18 18	James Spro Theodore Bankly, PE Stephen Bankovich. Richard Lentz Joseph Bonsduce Alveza Edraki, PE, PMP McEwan van der Mandele, CPP Ramesk Rajapopal, PE SUPP Technical Support Staff	Comms Bys Integ. Sys. Integ. Signals Signals Safety & Sec. Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT \$TAFF Eng. Start	0 0 12 0 0 0 0	\$100.00 \$59.10 \$81.90 \$100.70 \$99.60 \$77.70 \$73.30 \$50.37	\$ \$70 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$			
	13 14 15 16 17 18 18 18	James Sgro Theodora Banky, PE Stephen Bankovich, Richard Leniz Joseph Bonsduce Alreza Eonal, PE, PMP McEwan van der Mandele, CPP Ramesh Rajapopal, PE SUPP Technical Support Staff Administrative Sueport Staff	Comms Gys. Inleg. Sys. Inleg. Signals Santy & Sec. Santy & Sec. Hydraulics & Hydrology ORT \$1XFF Eng. Staff CAD/ ADMIN		\$100.00 \$59.10 \$81.90 \$100.70 \$49.60 \$77.70 \$73.30 \$50.37 \$45.14	\$70			
	13 14 15 16 17 18 18 18 18	James Sgro Theodore Banky, PE Stephen Bankovich. Richard Lentz Joseph Bonsduce Altrezs Edrail, PE, PMP McEwan van der Mandele, CPP Ramesh Rajapopat, PE SuPP Technical Support Staff Administrative Support Staff PALE Y & ALD/ROCH	Comma Bry Inleg. Signals Signals Signals Signals Santy & Sec. Santy & Sec. Santy & Sec. Hydraios & Hydrology OKT STAFF Eng. Start CAD: ADMIN	0 12 0 0 0 0 0	\$100.00 \$59.10 \$81.90 \$100.70 \$99.60 \$77.70 \$73.30 \$50.37	\$70			
	13 14 15 16 17 18 18 18 18	James Sgro Theodore Bankly, PE Stephen Bankovich. Richard Leniz Joseph Bonsduce Altrosze Graki, PE, PMP McEwan van der Mandele, CPP Rameski Rajapopal, PE BUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH TECHN	Comms Bys Integ. Signate Signa	0 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.00 \$59.10 \$81.90 \$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.14 \$220.84%				
	13 14 15 18 17 18 18 18 18 20 21	James Sgro Theodora Banky, PE Stephen Barkovich, Richard Leniz Joseph Bonsduce Alreza Eonsil, PE, PMP McEwan van der Mandele, CPP Rameski Rajagopal, PE SUPP Technical Support Staff PALE Y & ALLPRICH TECHN Ed Zaminskie, PE	Comma Bry Inleg. Syn Inleg. Signals Signals Signals Signals Signals Safety & Sec. Safety & Sec. Hydraulica & Hydrology ORT \$TAFF Eng. Staff CAD: ADMIN ICAL \$TAFF Laad Gooldechincal Eng.	0 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.00 \$59.10 \$100.70 \$100.70 \$98.60 \$77.70 \$73.30 \$50.37 \$43.14 \$20.545 \$84.05	3 870 3 3 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	13 14 15 16 17 18 18 18 18 20 21 21	James Sgro Theodore Banky, PE Stephene Bankovich, Richard Lentz Joseph Bonsduce Altrezs Edraki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajapopat, PE SuPP Technical Support Staff Administrative Support Staff Technical Support Staff Technical Support Staff TECHN Ed Zaminskie, PE Project Engineer	Comma Bry Inleg. Signals Signals Signals Signals Signals Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Hydraulica & Hydrology ONT \$13FF Eng. Start CAD: ADMIN CAL STAFF Lawl Goolechnical Eng. Proped Enganeer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.00 \$59.10 \$190.50 \$77.00 \$77.50 \$50.37 \$43.14 \$20.545 \$50.50	\$ \$70 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$			
	13 14 15 18 17 18 18 18 18 20 21	James Sgro Theodore Bankly, PE Stephen Bankovich Richard Leniz Joseph Bonsduce Altrosa Edral, PE, PMP McEwan van der Mandele, CPP Ramesk Rajagopal, PE SUPP Technical Support Staff PALLEY & ALLINGCH TECHN Ed Zammskar, PE Project Engineer Engineering Staff	Comms Bys Integ. Syn. Integ. Signals S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.00 \$59.10 \$100.70 \$700.70 \$73.30 \$73.30 \$50.37 \$43.14 \$220.54% \$50.50 \$50.50 \$50.50	3 370 3 3 3 3 3 3 3 3 3 3 5 7 3 1.43 3 5,52			
	13 14 15 16 17 18 18 18 18 20 21 21	James Sgro Theodora Banky, PE Stephen Bankovich, Richard Leniz Joseph Bonsduce Alreza Edraki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajapopal, PE Surpe Technical Support Staff HALEY & ALDROCH TECHN Ed Zaminskie, PE Project Engineers Engineering Staff	Comma Bry Inleg. Sry. Inleg. Signals Signals Signals Signals Satisty & Sec. Satisty & Sec. Satisty & Sec. Hydraulica & Hydrology ORT STAFF Eng. Start CAD: ADMIN ICAL STAFF Usad Goolechinical Eng. Project Eugenew Eng Start & Eng Start	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.00 \$59.10 \$190.50 \$77.00 \$77.50 \$50.37 \$43.14 \$20.545 \$50.50	3 370 3 3 3 3 3 3 3 3 3 3 5 7 3 1.43 3 5,52			
	13 14 15 16 17 18 18 18 18 20 21 21	James Sgro Theodore Banky, PE Stephen Bankovich, Richard Lentz Joseph Bonaduce Altraza Edraki, PE, PMP McEwan van der Mandels, CPP Ramesh Rajapopat, PE Supp Technical Support Staff Administrative Support Staff MaLEY & ALLDROCH TECHN Ed Zaminskie, PE Project Engineers Engineering Staff Junior Engineering Staff Supp	Comma Bry Inleg. Signals Signals Signals Signals Signals Signals Signals Signals Signals Signals Signals Signals CAD ADMIN CAL STAFF Laad Goolechnical Eng. Project Engineer Eng Staff Jan Staff Signals Ar Eng Staff Signals	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.00 \$59.10 \$100.70	3 370 3 3 3 3 3 3 3 3 3 5 5 3 5 5 3 5 5 5 5			
	13 14 15 16 17 18 18 18 18 20 21 21	James Sgro Theodora Banky, PE Stephen Barkovich, Richard Leniz Joseph Bonsduce Ahreza Grasi, PE, PMP McEwan van der Mandele, CPP Rameski Rajagopal, PE SUPP Technical Support Staff HALE Y & ALDROCH Project Engineers Engineering Staff Junior Engineering Staff SUPP CADO' Project Assistant	Comms By Integ. Sys. Integ. Signals Signals Sativy & Sec. Sativy & Sec. Sativy & Sec. Hydraulics & Hydrology ORT STAFF Eng Staff CAD' ADMIN ICAL STAFF Usad Goolechnical Eng. Project Enginew Eng Staff Jr. Eng Staff ORT STAFF CAD' ADMIN	0 0 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.00 \$59.10 \$100.70 \$700.70 \$73.30 \$77.70 \$73.30 \$50.37 \$43.14 \$20.54% \$50.50 \$50.50 \$50.60 \$350.60 \$350.60 \$350.60 \$350.60 \$351.90	3 370 3 3 3 3 3 3 3 3 3 5 5 3 5 5 3 5 5 5 5			
	13 14 15 16 17 18 18 18 18 20 21 21	James Sgro Theodore Banky, PE Stephene Bankovich, Richard Lentz Joseph Bonsduce Altroza Edraki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajepopal, PE SuPP Technical Support Staff MALE Y & ALDROCH TECH Ed Zaminsker, PE Project Engineer Engineering Staff Junior Engineering Staff SUPP (CADO) Project Assattant GROFFIN ENGINEERING	Comms By Integ. Sys. Integ. Signals Signals Sativy & Sec. Sativy & Sec. Sativy & Sec. Hydraulics & Hydrology ORT STAFF Eng Staff CAD' ADMIN ICAL STAFF Usad Goolechnical Eng. Project Enginew Eng Staff Jr. Eng Staff ORT STAFF CAD' ADMIN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.00 \$59.10 \$100.70	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3			

2 Rich Baron SURV PM 0 \$53.30 3 Protect Surveyor SURV PM 0 \$53.30 4 Party Chief SURV Inst. Tech. 0 \$47.50 5 Instrument Technician SURV Inst. Tech. 0 \$28.62 6 R On Rotunno. PE UTIL Ling 0 \$37.21 8 Non Rotunno. PE UTIL Ling 0 \$37.26 8 R On Rotunno. PE UTIL Ling 0 \$37.66 9 Senior Structural Engineering Staff UTIL Eng Staff 0 \$37.79 9 Sterior Structural Engineering Staff UTIL Eng Staff 0 \$37.79 10 Structural Engineering Staff UTIL Eng Staff 0 \$37.79 9 Sterior Structural Engineering Staff 0 \$354.50 0 11 ICAD Marager CAD Tech 0 \$30.54 2 Thomas Hartiery VE Team Lead 0 \$42.00 2 Thomas Hartiery VE Team Lead 0		NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY			
1 John Tan, PE PM 0 \$90.56 2 Rich Baron SURV PM 0 \$53.30 3 Project Surveyor SURV PM (Surveyor) 0 \$47.50 4 Party Chief SURV Proj. Surveyor 0 \$47.50 5 Instrument Technician SURV Inst. Tech. 0 \$37.21 5 Instrument Technician SURV Inst. Tech. 0 \$37.21 6 Rich Rottumo. PE UTIL Myr 0 \$37.466 7 Senior Structurat Engineering Staff UTIL Eng Staff 0 \$37.79 9 Senior Structurat Engineering Staff STR Eng Staff 0 \$37.79 10 Structural Engineering Staff STR Eng Staff 0 \$329.22 11 CAD Mager 0 \$330.54 \$35.819 12 CAD Mager 0 \$30.54 \$30.54 11 CAD Mager 0 \$42.00 \$30.54 2 Thomas Hariney VE Team 0 \$35.00	10		NAIK CONSULTING GR	OUP OV	ERHEAD RATE	127.09%				
2 Rich Baron SURV PM 0 358.30 3 Project Surveyor SURV Proj. Surv 0 \$47.50 4 Parry Chief SURV Proj. Surv 0 \$47.50 4 Parry Chief SURV Inst. Tech. 0 \$47.50 5 Instrument Technician SURV Inst. Tech. 0 \$37.21 6 Ron Rotunno. PE UTIL Mgr 0 \$47.50 7 Servior Witty Engineering Staff UTIL Eng Staff 0 \$37.79 9 Servior Structural Engineering Staff UTIL Eng Staff 0 \$345.50 10 Structural Engineering Staff STR Eng Staff 0 \$354.50 11 CAD Manager CAD Mgr 0 \$581.91 12 CAD Manager CAD Tach 0 \$30.54 11 CAD Manager CAD Tach 0 \$30.54 2 Thomas Hartley VE Team Laad 0 \$42.00 2 Thomas Hartley VE Team Laad 0 \$47.52										
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S Instrument Technician SURV Inst. Tech. O S22.62 6 Ron Roturino, PE UTIL May 0 374.66 7 Sendro Uffity Engineer UTIL May 0 374.66 7 Sendro Uffity Engineer UTIL May 0 374.66 8 Utiley Engineering Staff UTIL Eng Staff 0 337.79 9 Sendro Structural Engineering Staff STR Sen. Eng 0 354.50 10 Structural Engineering Staff STR Sen. Eng 0 354.50 11 CAD Manager CAD May 0 354.50 11 CAD Manager CAD May 0 358.19 12 CAD Manager CAD May 0 358.19 12 CAD Manager Doc. Ctrl. Mgr 0 355.00 2 Thomas Hartley VE Team Lead 0 355.00 2 Thomas Hartley VE Team 0 355.00 3 Configuration Management Config. Mgmi. 0 355.00		3	Project Surveyor			\$47.50	\$0			
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9 Servior Structural Engineering Staff 0 544.50 10 Structural Engineering Staff 0 329.22 SupPort StAFF 11 CAD Manager CAD Mor 0 329.22 The Eng Staff 0 329.22 The Eng Staff 0 329.22 The CAD Manager CAD Manager CAD Technicans CAD Technical STAFF Thomas Hartiey Thomas Hartiey VE Team Lead OVERHEAD RATE Thomas Hartiey VE Team Lead O \$42.00 Structural Engineering Team O \$3 Config. Mgmt. O \$3 Config. Mgmt. O \$355.00 VE Team Lead O \$355.00 OVERHEAD RATE 117.31% TECHNICAL STAFF SUPPORT STAFF O \$40.200 Sta		8	Utility Engineering Staff	UTIL Eng Staff	0	\$37 79	\$0			
10 Structural Engineering Staff STR Eng Staff 0 \$29,22 SUPPORT STAFF 11 CAD Manager CAD Marg 0 \$58 19 12 CAD Technicians CAD Tech 0 \$30,54 ENVISION VEX TECHNICAL STAFF 1 (Kurt Buetitier DOC. Ctrl. Mgr 0 \$42,00 1 (Kurt Buetitier DOC. Ctrl. Mgr 0 \$42,00 2 Thomas Haritey VE Team 0 \$42,00 3 Configuration Management Config. Mgrn. 0 \$355,00 4 Value Engineering Team 0 \$21,40 JCMS OVERHEAD RATE 117,32% JECHNICAL STAFF SUPPORT STAFF 3 SUPPORT STAFF 3 Config. Mgrn. O S21,40 3 Support Staff <td c<="" td=""><td></td><td></td><td></td><td>STR Sen. Eng.</td><td>0</td><td></td><td>\$0</td></td>	<td></td> <td></td> <td></td> <td>STR Sen. Eng.</td> <td>0</td> <td></td> <td>\$0</td>				STR Sen. Eng.	0		\$0		
Il ICAD Manager ICAD May Image: Organization of the state of		10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0			
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Q 3 Configuration Management Config. Mgmil. 0 \$\$55.00 4 Value Engineering Team VE Team 0 \$75.52 SUPPORT STAFF 0 \$21.40 JCMS OVERHEAD RATE 117.32% 1 K. Meetian Sensor Est. 0 \$63.67 2 JCMS OVERHEAD RATE 117.32% 1 K. Meetian Sensor Est. 0 \$63.67 2 Junior Estimator Junion Est. 0 \$46.20 3 Project Controls PC 0 \$46.20 3 I Chitra Radin Disc. Lead 0 \$46.20 2 I Chitra Radin Disc. Lead 0 \$38.21 2 Beth Uczynski [CAD IV 0 \$38.21 3 SJM TECHNICAL \$7AFF 0 \$38.21 2 [Beth Uczynski [CAD IV 0 \$38.21 3 SJM TECHNICAL \$7AFF 0 \$38.21 2	z			VE Team Lead			\$0			
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JCMS OVERHEAD RATE 117.32% 1 K. Meetaan Senior Est. 0 363.67 2 Junior Estimator Junior Est. 0 364.20 3 Project Controls PC 0 357.75 RALIN OVERHEAD RATE 117.32% 2 Junior Estimator Junion Est. 0 364.20 3 Project Controls PC 0 357.75 RALIN OVERHEAD RATE 156.17% TECHNICAL STAFF OVERHEAD RATE 156.17% TECHNICAL STAFF OVERHEAD RATE 156.17% SUPPORT STAFF OVERHEAD RATE SUPPORT STAFF OVERHEAD RATE SUPPORT STAFF OVERHEAD RATE SUPPORT STAFF OVERHEAD RATE SUPORT STAFF SUPORT OF	≩	SUPPORT STAFF								
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KADRN OVERHEAD RATE 136.17% I [Chtra Radn Dasc. Lead 0] \$100.00] 2 [Beth Uczymski [CAD IV 0] \$38.21] SJH TECHNICAL STAFF 00 \$38.21] 2 [Senior Engineering Staff Sen. Eng Staff 0] \$59.58]	1.5			Junion Est.	0	\$46,20	\$0			
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I Chitra Radin [Disc. Lead 0 \$100.00 SUPPORT STAFF	100	-	KADIN	OVE	RHEAD RATE	155.17%				
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SJH OVERHEAD RATE 140.00% I S Jayekumaran CMB Eng VIII 0 \$84.24 2 Senior Engineering Staff Sen. Eng Staff 0 \$59.58	ΙΞΙ	_1	Chitra Radin	Disc. Lead	0	\$100.00	\$0			
SJH OVERHEAD RATE 140.00% TECHNICAL STAFF 1 S. Jayekumaran CMI Eng VIII 0 \$84.24 2 Senior Engineering Staff Sen. Eng Staff 0 \$59.58	2			JPPORT STAFF						
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2 Senior Engineering Staff Sen. Eng Staff 0 \$59.58				CHNICAL STAFF						
				Civil Eng VIII	0	\$84.24	\$0			
	[폭]				Ö		\$0			
	ன்	3	Engineering Staff	Eng. Staff	0	\$40.43	\$0			

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	512		
Total Salary			\$27,199
Overhead			\$48,114
Subtotal			\$73,412
Fixed Fee	1	10%	\$7,341
Total Direct Costs			\$0
TOTAL COST			\$80,754

ľ	ASK.		STIMATE BY INDIVIDUA	FIRM:					
- 14		Navigation Study		ETT FLEMING JV					
	NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR			
H	-	HARDESTY & HAROVER	OW NICAL STAFF	ENHEAD RATE	187,40%	Berlin and a state			
F	1	Maha Szumanski, PE				_			
H	2	Charlis Geer, PE	PM, STR Eng Vill	0	\$96.86				
H	3	David Tuckman, PE	Risk Manager	0	\$96.01				
Ь	4	Steve Hartacker, PE, SE	OPM. STR Eng VII GAQC, STR Eng VI	0	\$81 81	-			
F	5	Steve Hom, PE	STR Eng VII	0	\$72.32	-			
F	6	Peter Roody, PE		48					
ŀ	7	Michael Hawkins, PE	STR Eng VIII STR Eng VIII	40	\$86.51	\$4.1			
H	8	Sleve Mikucki, PE	MECH Eng VII	0		-			
Ŀ	9	Alex Noble, PE	ELEC Eng VI	0	\$86.43 \$70.29	-			
h	10	Paul Connolly, PE	STR Eng VII	0	\$40.09	-			
h	11	Glen Schetelich, PE	STR Eng VIII	100	\$109,79	310.97			
h	12	Raymond Mankbadi, PE	STR Eng VIII	0	\$86 58	210,91			
Ŀ	13	Mishac Yegian, PE, PbD	STR Eng Viti	0	\$76,13	-			
h	14	David Marcic, PE, SE	STR Eng VI	0	\$72.55	-			
F	15	Jerry DiMaggio.PE	STR Eng VIII	0	\$76.13				
h	16	David Gerber, PE	STR Eng VI	0	\$75 63				
t	17	Ovew DeteDonne, RA	STR Eng VI	0	\$69.83				
t	-	SUPP	ORT STAFF			-			
r	18	Support Staff	ISTRIC	152	\$46.04	\$6.95			
r	19	Support Staff	MECHIV	0	\$46.04				
F	20	Support Steff	ELEC IV	0	\$40 D4				
E	21	Support Staff	CAD' ADMIN	0	\$37.23				
t		GANNETT FLEMING	OW	SHEAD BATE	169.17%				
r	TECHNICAL STAFF								
г	1	Richard Cross, PE	DPM	0	\$105.40	3			
r	2	David Howell, PE	Rail Sys. Lead	0	\$64.70				
r	3	Bruce Smith	Quality Control	0	383.80	-			
F	4	Robert Matthews, PE	Civil Lead	0	\$79.20	-			
Е	5	Steven Zapoliczny, PE	SterCivil	0	\$43.70				
Γ	6	Agnieszkas Lapinski, PE	Sr. Structural	0	\$72.00				
Γ	7	John Legath, PE	Track	0	\$64.10				
E	8	Terry Shantz, PE	Call Trans	0	\$99,20				
E	8	Bryen Shober, PE	CaV Trans	0	\$84.30	1			
L	10	Greg Nazarow	Rail Ops	0	\$79.20	1			
E	11	lan Martin	Reil Ops	0	\$76.60	1			
L	12	Net Water	Comma	0	\$73.70	1			
	13	James Sigro	Comma	0	\$90.00	1			
L	14	Theodore Bandy, PE	Sys integ	0	\$100.00	1			
ł		Stephen Barkovich	Sys. Integ.	0	\$59.10	5			
E	15					1			
	16	Richard Lentz	Signals	0	\$81.90				
	16 17	Richard Lentz Joseph Bonaduce	Signals Signals	0	\$100.70				
	16 17 18	Richard Lentz Joseph Bonaduce Aireza Edraki, PE, PMP	Signals Signals Safety & Sec.	0 D 0	\$100.70 \$99.60	-			
	16 17 18 18	Richard Lentz Joseph Bonaduce Akreza Edraki, PE, PMP McEwan van der Mandele, CPP	Signals Signals Safety & Sec. Safety & Sec.	0 0 0	\$100.70				
	16 17 18	Richard Lentz Joseph Bonaduce Alireza Edralu, PE, PAIP McEwan van der Mandele, CPP Ramesh Rajagopal, PE	Signals Signals Safety & Sec. Safety & Sec. Hydraulics & Hydrology	0 D 0	\$100.70 \$99.60				
	16 17 18 18 19	Richard Lentz Joseph Bonaduce Aireza Edraki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP	Signats Signats Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT STAFF	0 0 0 0	\$100.70 \$89.60 \$77.70 \$73.30				
	16 17 18 18 19 20	Richard Lentz Joseph Bonaduce Alreza Edraki, PE, Plaip MCEwan van der Mandele, CPP Ramesh Raspopal, PE SUPP Technical Buspont Staff	Signais Signais Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT STAFF Eng. Staff	0 0 0 0	\$100.70 \$89.60 \$77.70 \$73.30 \$50.37				
	16 17 18 18 19	Richard Lentz Joseph Bonaduce Alreza Carki, PE, MaiP McEven van der Mandele, CPP Ramesh Rauspoal, PE SUPP Technical Support Staff Administrative Buopon Staff	Signats Eignats Safety & Sec. Safety & Sec. Hydraulics & Hydrology OKT STAFF Eing Staff CAD/ ADMIN	0 0 0 0 0	\$100.70 \$49.60 \$77.70 \$73.30 \$50.37 \$43.14				
	16 17 18 18 19 20	Richard Lentz Joseph Bonaduce Akreza Carki, PE, PhilP McEwan van der Mandele, CPP Ramesh Rassonal, PE SUPP Technical Lugnon Staff Administrative Buspon Staff FALLEY & ALDRICH	Signals Bignals Bahty & Sec. Sahty & Sec. Phytraulics & Hydrology ONT STAFF Eng Staff CADY ADMIN	0 0 0 0	\$100.70 \$89.60 \$77.70 \$73.30 \$50.37				
	16 17 18 18 19 20	Richard Lentz Joseph Bonsduce Alreza Edrak, PE, PAIP McEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff HALEY & ALLIPRCH TECHN	Signais Signais Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Hydroulos & Hydrology ONT STAFF Eng Staff CAD ADMIN OW ICAL STAFF	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.34 220.345				
	16 17 18 18 19 20 21	Richard Lentz Joseph Bonaduce Alreza Carki, PE, MaiP McEven van der Mandele, CPP Ramesh Rausposal, PE SUPP Technical Support Staff Administrative Support Staff PALEY & ALDRICH TECHN Ed Zaminskie, PE	Signals Signals Sahty & Sec. Sahty & Sec. Pydraulics & Hydrology ORT STAFF ICAL STAFF Lead Grondwical Eng.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.14 280.94%				
	16 17 18 18 18 18 19 20 21 1 1 2	Richard Lentz Joseph Bonaduce Akreza Eraki, PE, PhilP McEwan van der Mandele, CPP Ramesh Kassopal, PE SUPP Technical Buspion Staff Administrative Buspion Staff TALLEY & ALDRICH TECHN Ed Zaminskie, PE Project Engineer	Signals Signals Signals Safety & Sec. Safety & Sec. Phytraulics & Hydrology OKT STAFF Eng Start CAD: ADMIN CAD: STAFF Laad Geotechnical Eng. Project Engineer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$09.60 \$77.70 \$73.30 \$50.37 \$43.14 280.84 \$84.06 \$80.60				
	16 17 18 18 19 20 21 21 1 2 3	Richard Lentz Joseph Bonaduce Almaza Eraku, PE, PMIP McEwan van der Mandele, CPP Ramesh Rassopal, PE SUPP Technical Support Staff FALLEY & ALDRICH TECHN Ed Zaminskie, PE Project Engineer Engineering Staff	Signals Signals Signals Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Hydroules & Hydrology OKT STAFF Eng Staff CAC ADMIN DVR ICAL STAFF Laad Geometrical Eng. Project Engineer Eng Staff	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$199.60 \$77.70 \$73.30 \$43.34 201.945 \$84.66 \$80.60 \$50.60				
	16 17 18 18 18 18 19 20 21 1 1 2	Richard Lentz Joseph Bonaduce Alreza Carki, PE, MaiP McEven van der Mandele, CPP Ramesh Rauspotal, PE SUPP Technical Dupper Staff Administrative Buopon Staff HALEY & ALDRICH TECHN Ed Zaminskie, PE Project Engineer Engineering Staff	Signals Signals Sahty & Sec. Sahty & Sec. Sahty & Sec. Phytraulics & Hydrology ORT STAFF CAD: ADMIN ICAL STAFF Lad Georechnical Eng. Project Engineer Eng Staff J. Eng Staff	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$09.60 \$77.70 \$73.30 \$50.37 \$43.14 280.84 \$84.06 \$80.60				
	16 17 18 18 19 20 21 21 1 2 3 4	Richard Lentz Joseph Bonaduce Akreza Eraki, PE, PhilP McEwan van der Mandele, CPP Ramesh Kajagopal, PE SUPP Technical Bugnert Staff Administrative Bugner Staff TRALEY & ALDRICH TECHN Ed Zaminiskie, PE Project Engineer Engineering Staff Janor Engineering Staff	Signals Signals Signals Signals Safety & Sec. Safety & Sec. Safety & Sec. Phytraulics & Hydrology OKT STAFF Eng Start CADY ADMIN CMD CADY ADMIN CMD CADY STAFF Laad Geotechnical Eng. Project Engineer Eng Start .r. Eng Start .r. Eng Start OKT STAFF	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$199.60 \$77.70 \$13.30 \$43.34 \$50.37 \$43.34 \$50.60 \$50.60 \$34.99				
	16 17 18 18 19 20 21 21 1 2 3 4	Richard Lentz Joseph Bonaduce Almeza Ednak, PE, PikiP McEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff HALEY & ALDRICH TECHN Ed Zaminskie, PE Project Engineering Staff Janor Engineering Staff Janor Engineering Staff Janor Engineering Staff	Signals Signals Signals Signals Signals Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Phytroules & Hytrology OAT STAFF Eng Staff CAD ADMIN OW ICAL STAFF Laad Geometrical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF CAD ADMIN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$195.60 \$77.70 \$73.30 \$43.14 280.545 \$44.05 \$40.60 \$50.69 \$34.99 \$34.99				
	16 17 18 18 19 20 21 21 1 2 3 4	Richard Lentz Joseph Bonaduce Alreza Carki, PE, MAP McEven van der Mandele, CPP Ramesh Ragegoal, PE SUPP Technical Dapton Staff Administrative Buspon Staff FRALET & ALDIRICH TECHN Ed Zaminskie, PE Project Engineer Engineering Staff Supp CADDY Project Assistant SUPP	Signals Signals Signals Signals Signals Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Phytroules & Hytrology OAT STAFF Eng Staff CAD ADMIN OW ICAL STAFF Laad Geometrical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF CAD ADMIN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$199.60 \$77.70 \$13.30 \$43.34 \$50.37 \$43.34 \$50.60 \$50.60 \$34.99				

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED	HOURLY RATE	TOTAL SALARY			
100		NAIK CONSULTING GR	V0 900	ERHEAD RATE	127.09%				
	TECHNICAL STAFF								
	1	John Tan, PE	PM	0	\$90,56	\$0			
	2	Rich Baron	SURV PM	0		\$0 \$0 \$0			
E I	3	Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0			
	4	Party Chief	SURV Inst. Tech.	0	\$37.21	\$0			
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0			
		Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0			
	7	Senior Ulity Engineer	UTIL Sen. Eng.	0		50			
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37 79				
		Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0 \$0			
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0			
4			PPORT STAFF						
NAIK	11	CAD Manager	CAD Mgr	0	\$58 19	\$0			
Z.	12	CAD Technicians	CAD Tech	0		\$0			
		ENVISION	OV	ERHEAD RATE	137.51%				
	TECHNICAL STAFF								
		Kurl Buettler	Doc. Ctrl. Mgr	0	\$42.00	\$0			
z		Thomas Harbey	VE Team Lead	0	\$94.40	\$0 \$0			
Q	3	Configuration Management	Config. Mgmil.	0	\$55.00	\$0			
2	4	Value Engineering Team	VE Team	0	\$75.52	\$0			
ENVISION			IPPORT STAFF						
	5	Administration	Admin	0	\$21.40	\$0			
		JCMS		ERHEAD RATE	117.32%				
		TEC	CHNICAL STAFF						
JCMS		K. Meehan	Senior Est	0	\$63.67	\$0			
12		Junior Estimator	Junion Est.	0	\$46.20	\$0			
1×	3	Project Controls	PC	0	\$57 75	\$0 \$0			
		RADIN	OV	ERHEAD RATE	155.17%				
			CHNICAL STAFF						
I S I	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0			
RADIN			PPORT STAFF						
5	2	Beth Uczynski	CADIV	0	\$38.21	\$0			
		SJH		RHEADRATE	140.00%				
			CHNICAL STAFF						
	3	S Jayakumaran	Civil Eng VIII	0	\$84.24	\$0			
Hrs	2	Senior Engineering Staff	Sen Eng Staff	0	\$59.58	\$0			
S.	3	Engineering Staff	Eng Staff	0		\$0			

TEAM SUMMAR	Y.		
TOTAL ESTIMATED HOURS	300	1.00	
Total Salary	-		\$22,130
Overhead			\$34,83
Subtotal			\$56,962
Fixed Fee		10%	\$5,696
Total Direct Costs			50
TOTAL COST			\$42,658

-		STIMATE BY INDIVIDUA	LITASK							
TASK:		-	FIRM:							
4.8	Conceptual Design		HAHIGANN	ETT FLEMING	11/					
_				CITICEMING	14					
NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR					
	HARDESTY & HANOVER		ERREAU RATE	187,46%						
		NICAL STAFF								
1	Visha Szumanski, PE	PM, STR Eng Vill	0							
2	Charlie Geer, PE	Risk Manager	0	\$96.01	1					
3	David Tuckman, PE	DPM, STR Eng VII	0	\$81.81	5					
4	Steve Harlacker, PE, SE	QAOC, STR Eng VI	Ó	\$72.32						
5	Steve Hom, PE	STR Eng Vil	60	\$80.39	\$4.82					
6	Peter Roody, PE	STR Eng Vill	70	\$86.51	\$6.05					
7	Michael Hawkins, PE	STR Eng VIII	90	\$106.14	\$9.5					
8	Sleve Mikucki, PE	MECH Eng VII	52	\$86.43	\$4.45					
9	Alex Noble, PE	ELEC Eng VI	51	\$70.29	\$3.58					
10	Paul Connolly, PE	STR Eng VII	111	\$80.09	\$8.69					
11	Gien Schetelich, PE	STR Eng VIII	0	\$109,79						
12	Raymond Mankbadi, PE	STR Eng VIII	212	\$86,58	\$18,35					
13	Mishac Yegian, PE, PhD	STR Eng Vill	0	\$76.13						
14	David Marcic, PE, SE	STR Eng VI	210	\$72.55	\$15.2					
15	Jeny DiMaggio,PE	STR Eng VIII	0	\$78.13						
16	David Gerber, PE	STR Eng VI	145	\$75.63	\$10.96					
	Drew DelleDonne, RA	STR Eng VI	0	\$69.63	910.90					
		ORT STAFF		408.03						
18	Support Staff	ISTR I-V	630	\$46.041	\$29.00					
	Support Staff	MECH I-V	105	\$46.04						
	Support Staff	ELECIV	105		\$4,63					
	Support Staff	CADY ADMIN	103	\$46.04	\$4,83					
+	GANNETTFLEMING			\$37.23						
	GANNETT FLEMING OVERHEAD RATE 159,17%									
	Richard Cross, PE	IDPM								
	David Howell PE		0	\$105.40	\$					
	Bruce Smith	Rail Sys. Lead	150	\$64.70	\$9,70					
		Quality Control	0	\$63.60	- 1					
	Robert Matthews, PE	Civil Lead	64	\$79.20	\$5,06					
	Steven Zapoliczny, PE	Site/Civil	60	\$43.70	\$3,49					
	Agnieszkka Lapinski, PE	Sr. Structural	42	\$72.00	\$3,02					
	John Legath, PE	Track	336	\$64.10	\$21,53					
	Terry Shantz, PE	Cal/ Trans	24	\$99.20	\$2,36					
	Bryan Shober, PE	Call Trans	26	\$84.30	\$2.36					
10	Greg Nazarow	Rail Ops	20	\$79,20	\$1.58					
	lan Martin	Rail Ops	20	\$76.60	\$1.53					
12	Net Water	Comms		\$73,70						
13	James Soro	Comms	0	\$90.00						
	Theodore Bandy, PE	Sys. Integ.	28	\$100.00	\$2.80					
	Slephen Barkovich	Sys. Integ	140	\$59.10	\$8,27					
	Richard Lentz	Signals	4	\$81.90	\$32					
	Joseph Bonaduce	Signals	40	\$100.70	\$32					
	Aireza Edraki, PE, PMP	Safety & Sec.	40	\$99.60	\$4,02					
	McEwan van der Mandele, CPP	Safety & Sec.	0							
	Ramesh Rajagopal, PE	Satety & Sec. Hydraulics & Hydrology		\$77,70	\$					
H		ORT STAFF	0	\$73.30	5					
20 1	Technical Support Staff									
	Administrative Support Staff	Eng. Staff CAD/ ADMIN	1.340	\$50.37	\$67,49					
1 21 1	HALLET & ALDRICH		266 RHEAD RATE	\$43.14	\$11.47					
21			SAME THE PARTY	220.34%	-					
21	TPALA									
		ICAL STAFF								
- 1	Ed Zaminskie, PE	ICAL STAFF	0	\$84.06						
1	Ed Zaminskie, PE Project Engineer	ICAL STAFF Lead Geolechnical Eng. Project Engineer	0	\$60.60	\$					
1 2 3	Ed Zaminskie, PE Project Engineer Engineering Staff	ICAL STAFF Lead Geolechnical Eng. Project Engineer Eng Staff	0	\$60.60	5					
1 2 3	Ed Zaminskie, PE Project Engineer Engineering Staff Junior Engineering Staff	ICAL STAFF Lead Geolechnical Eng. Project Engineer Eng Staff Jr. Eng Staff	0	\$60.60	5					
1 2 3 4	Ed Zaminskie, PE Project Engineer Engineering Staff Junior Engineering Staff SUPP	ICAL STAFF Lead Geolechnical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF	0	\$60.60 350.69 \$34.99	5					
1 2 3 4 5	Ed Zaminskie, PE Project Engineer Engineering Staff Junior Engineering Staff SUPPI CADD/ Project Assistant	ICAL STAFF Lead Geotechnical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF CAD/ ADMIN	0	\$60.60 350.69 \$34.99 \$30.30	5					
1 2 3 4 5	Ed Zaminskie PE Project Engineer Engineering Staff Juhor Engewehring Staff Juhor Engewehring Staff SUPP CADD/ Project Assistant GRUP FIN ENGINEERING	ICAL STAFF Lead Geolechnical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF CADY ADMIN	0	\$60.60 350.69 \$34.99	\$					
	Ed Zaminskie PE Project Engineer Engineering Staff Junior Engineering Staff Support CADO/ Project Assistant GRIFFIN ENGINEERING TECHN	ICAL STAFF Lead Geotechnical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF CAD/ ADMIN	0	\$60.60 350.69 \$34.99 \$30.30	\$ \$ \$ \$					

_	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS		TOTAL SALARY			
100		NAIK CONSULTING GR		RHEADRATE	127.09%				
		TE							
		John Tan, PE	PM	0	\$90.56	\$0			
		Rich Baron	SURV PM	0	\$58.30	50			
		Project Surveyor	SURV Proj. Surv	0	\$47,50	\$0			
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0			
		Instrument Technician	SURV Inst. Tech	0	\$28.62	\$0			
		Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0			
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45.79	50			
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37 79	50			
	9	Senior Structural Engineer	STR Sen. Eng.	96	\$54.50	\$5,232			
	10	Structural Engineering Staff	STR Eng Staff	120	\$29.22	\$3,506			
1			UPPORT STAFF						
NAIK	11	CAD Manager	CAD Mor	0	\$58,19	50			
Z	12	CAD Technicians	CAD Tech	84	\$30,54	\$2,565			
101	-	ENVISION	137.51%						
12	TECHNICAL STAFF								
	1	Kurt Buettler	Doc. Ctrt. Mgr	0	\$42.00	\$0			
z	2	Thomas Hartiey	VE Team Lead	0	\$94,40	\$0			
Ō	3	Configuration Management	Config. Mont.	0	\$55.00	\$0			
100	4	Value Engineering Team	VE Team	0		\$0			
ENVISION		SI							
	5	Administration	Admen	0	\$21.40	\$0			
		JCMS	OV	RHEADRATE					
		TE	CHNICAL STAFF						
97	1	K. Meehan	Senior Est.	216	\$63.67	\$13,753			
JCMS	2	Junior Estimator	Junion Est.	104	\$46.20	\$4,805			
¥.	3	Project Controls	PC	200	\$57.75				
		RADIN	OV	READRATE	155.17%	011.000			
		TE	CHNICAL STAFF			_			
ŝ	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0			
RADIN	_	\$L	PPORT STAFF		0100.00	40			
2	2	Beth Uczynski	ICAD IV	0	\$38,21	\$0			
	200	SJH	OV	RHEADRATE	140.00%				
		TE	CHNICAL STAFF						
	-1	S. Jayakumaran	Civil Eng VIII	36	\$84,24	\$3,033			
I	2	Senior Engineering Staff	Sen Eng Staff	84	\$59.58	\$5,005			
HLS	3	Engineering Staff	Eng Slaff	56	\$40.43	\$2,264			
			Territoria anticia		440.43	34,404			

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	5,519		
Total Salary		1	\$328,433
Overhead			\$498,630
Subtotal		3	\$\$25.063
Elixed Fee		10%	\$82 504
Total Direct Costs			50
TOTAL COST	10		\$907.565

TASK:		STIMATE BY INDIVIDUA	FIRM:					
1.	Feasibility Report	H&H / GANNETT FLEMING JV			JV			
NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR			
	HARDESTY & HANOVER	UVI VICAL STAFF	CRITEAD RATE	187,40%	P.V.			
	Mitha Szumanski, PE				_			
2	Charle Geer, PE	PM, STR Eng VIII Risk Manager	0	\$96.06	3			
3	David Tuckman, PE	OPM, STR Eng VII		\$98.01	3			
	Sleve Hartacker, PE. SE	GAOC, STR Eng VI	0	\$81.81	_			
3	Sleve Hom, PE	STR Eng Vil	0	\$80.39				
6	Peter Roody, PE	STR Eng VIII	6	\$86.51				
7	Michael Hawkins, PE	STR Eng VIII	6	\$106,14	\$51			
8	Steve Mikucki, PE	MECH Eng VII	10	\$85.43	\$64			
9	Alex Noble, PE	ELEC Eng VI	10	\$70.29	\$70			
10	Paul Connolly, PE	STR Eng VII	10	380.09	540			
11	Gien Schetelich, PE	STR Eng VIII	0	\$109,79				
12	Raymond Mankbadi, PE	STR Eng VIII	0	\$85.58				
13	Mishac Yegian, PE, PhD	STR Eng VIII	- 0	\$70.13				
14	David Marcic, PE. SE	STR Eng VI	0	\$72.55	-			
15	Jerry DiMeggia PE	STR Eng VIII	0	\$78,13				
16	David Gerber, PE	STR Eng VI	0	\$75.63				
17	Drew DeteDonne, RA	STR Eng VI	0	\$69.83	-			
		ORT STAFF	0	\$04.83				
18	Support Staff	STRIEV	34	\$46 64	\$1,50			
19	Support Staff	MECHIEV	8	\$46,04	\$1,00			
20	Support Staff	ELEC IV	8	\$46.04	130			
12 13 14 15 16 17 18 19 20 21	Support Staff	CADY ADMIN	10	337.23	137			
	GANNETT FLEMING		THEAD RATE	139.17%	1.14			
TECHNICAL STAFF								
	Richard Cross. PE	DPM I	0	\$105,40	5			
2	David Howell, PE	Rail Sys. Lead	18	\$64.70	\$1.16			
3	Bruce Smith	Quality Control	D	\$63.80	\$1.10			
4	Robert Matthews, PE	Chri Lead	24	\$79.20	\$1,90			
5	Saven Zapoliczny PF	Sile/Civil	6	\$43.70	\$26			
6	Agnieszkika Lapinski, PE	Sr. Structural	0	\$72.60	5			
7	John Legath, PE	Track	36	\$64.10	\$2.30			
0	Terry Shaniz, PE	Call Trans	0	\$99,20	5			
9	Bryan Shober, PL	Cat/ Trans	16	\$84.30	\$1,34			
10	Greg Nazarow	Rail Ops	0	\$79.20	5			
11	lan Martin	Rall Ops	22	\$76.60	\$1,68			
12	Not Water	Comms	20	173 76	\$1.47			
13	James Sgro	Comms	0	\$90.00				
14	Theodore Bandy, PE	Sys. Integ	0	\$100.00	5			
15	Slephen Barkovich	Sys. Integ.	0	\$59.10	5			
16	Richard Lentz	Signals	24	\$81.90	\$1.95			
17	Joseph Bonaduce	Signate		\$100,70	\$50			
18	Alwaza Edraki, PE, PMP	Safety & Sec.	0	\$99.60	500			
18	McEwan van der Mandele, CPP	Refety & Sec	0	\$77.70	3			
19	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73,30				
1		ORT STAFF		*******				
20	Technical Support Staff	Eng. Staff	122	\$50.37	\$6,14			
	Administrative Support Staff HALEY & ALDRICH	CADY ADMIN	0	343.14	30,14			
21	HALLY & ALLIGHT			220.34%				
		ICAL STAFF	M	154 791				
	Ed Zaminskie, PE	ICAL STAFF	0	\$54.05 \$50.60	5			
1 	Ed Zaminskie, PE Project Engineer	ICAL STAFF Lead Gaotechnics/ Eng. Project Engineer	0	\$60.60				
_ 21	TECHN Ed Zaminskie, PE Project Engineer Engineering Staff	ICAL STAFF Lead Geolechnical Eng. Project Engineer Eng Staff	0	\$60.60 \$50.69	\$			
21 1 2 3	TECHN Ed Zaminskie, PE Project Engineer Engineering Staff Junior Engineering Staff	ICAL STAFF Lead Geolechnical Eng. Project Engineer Eng Staff Jr. Eng Staff	0	\$60.60	3 3 3 5			
21 1 2 3	Ed Zaminskie, PE Project Engineer Engineering Staff Junior Engineering Staff SUPP	ICAL STAFF Load Geolechnical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF	0	\$60.60 150.68 \$34.99	\$			
21 1 2 3	TECHN Ed Zaminskie, PE Project Engineer Engineering Staff Janor Engineering Staff SUPP (CADC) Project Assistant	ICAL STAFF Lead Geolechnical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF CADY ADMIN	0 0 0	\$60.60 \$50.68 \$34.99 \$30.30	\$			
21 1 2 3	TECHN Ed Zaminskie, PE Project Engineers Engineering Staff Junor Engineering Staff Support CADDP Project Assistant GADP Project Assistant GADP Project Assistant	ICAL STAFF Lead Geolechnical Eng. Project Engineer Eng Staff Jr. Eng Staff ORT STAFF CADY ADMIN	0	\$60.60 150.68 \$34.99	\$			

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY			
	_	NAIK CONSULTING GR	OUP OV	ERHEAD RATE	127.09%	-			
	TECHNICAL STAFF								
		John Tan, PE	PM	0	\$90.56	\$0			
		Rich Baron	SURV PM	0	\$58.30	\$0			
	3	Project Surveyor	SURV Proj Surv	0	\$47 50	\$0			
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0 \$0			
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0			
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0			
	7	Senior Ulity Engineer	UTIL Sen. Eng	0	\$45 79	\$0			
!	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0			
	9	Senior Structural Engineer	STR Sen Eng.	6	\$54.50	\$436			
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0			
		8	JPPORT STAFF						
NAIK	- 11	CAD Manager	CAD Mor	0	\$58 19	\$0			
Z	12	CAD Technicians	CAD Tech	0	\$30.54	SÓ			
-	ENVISION OVERHEAD RATE 137,51%								
	TECHNICAL STAFF								
	1	Kurt Buettier	Ooc. Ctrl. Mgr	0	\$42.00	\$Ö			
z		Thomas Harley	VE Team Lead	0	\$94.40	50			
Q	3	Configuration Management	Config. Mgmt.	0	\$55.00	\$0			
2	4	Value Engineering Team	VE Team	0	\$75 52	\$0			
ENVISION	SUPPORT STAFF								
ü	5	Administration	Admin	0	\$21.40	\$0			
		JCMS	OV	ERHEAD RATE	117.32%				
		TE	CHNICAL STAFF						
S	1	K. Meehan	Senior Est.	0	\$63 67	\$0			
JCMS	2	Junior Estimator	Junion Est.	0	\$46.20	\$0			
SI	3	Project Controls	PC	0	\$57.75	\$0			
		RADIN	OV	ERHEAD RATE	155.17%				
_	1		CHNICAL STAFF						
롲	1	Chtra Radin	Disc. Lead	0	\$100.00	\$0			
RADIN			IPPORT STAFF						
2	2	Beth Uczynski	CADIV	0	\$38_21	\$0			
		SJH		ERREAD RATE	140.00%				
		TE	CHINICAL STAFF						
10	1	S. Jayakumaran	[Civil Eng VIII	0	\$84.24	\$0			
Ŧs	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0			
တ်	3	Engineering Staff	Eng. Staff	Ŏ	\$40.43	50			

TEAM SUMMAR	8Y	
TOTAL ESTIMATED HOURS	404	
Total Salary		\$25,588
Overhead		\$40,477
Subtotal		\$55,063
Fixed Fee	1	0% \$8,600
Total Direct Costs		\$864
TOTAL COST		\$73,833

		E	STIMATE BY INDIVIDUA					
1.00	SK:			FIRM:				
14	L 10	Value Engineering		H&H GANNE	ETT FLEMING	VL		
N	ю.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR		
(Per	-	HARDESTY & HANOVER	DA	URHEAD RATE	167,40%	A designed and and		
			RCAL STAFF		- T			
	1	Visita Szumanski, PE	PM, STR Eng VIII	0	\$96.86	\$		
	2	Charle Geer, PE	Risk Manager	0	\$98.01	5		
	3	David Tuckman, PE	OPM, STR Eng VII	0	\$81.81	\$		
	4	Steve Harlacker, PE, SE	GAOC, STR Eng VI	0	\$72.32	3		
	5	Sleve Hom, PE	STR Eng Vil	0	\$80.39	5		
	6	Peter Roody, PE	STR Eng Vill	48	\$86.51	\$4,15		
	7	Michael Hawkins, PE	STR Eng VIII	16	\$108.14	\$1,69		
	8	Steve Mikucki, PE	MECH Eng VII	12	\$85.43	\$1,03		
	9	Alex Noble, PE	ELEC Eng VI	12	\$70.29	\$84		
	10	Paul Connolly, PE	STR Eng Vil	0	\$80.09	5		
	11	Gien Scheleich, PE	STR Eng VIII	6	\$109.79			
	12	Raymond Mankbadi, PE	STR Eng Vill	0	\$86.58	3		
	13	Mishac Yegan, PE, PhD	STR Eng Vill	0	\$70.13	3		
	14	David Marcic, PL GE	STR Eng VI	Ď	\$72.55	3		
	15	Jerry DiMeggio PE	STR Eng Vill	0	\$75.13	\$		
	16	David Gerber, PE	STR Eng VI	0	\$75.63	\$		
	17	Draw DeleDonne, RA	STR Eng VI	6	\$69.83			
1000	-		ORT STAFF	And the second s				
	18	Support Staff	STRIEV	24	\$48.04	\$1.10		
	19	Support Staff	WECH I-V	16	\$46.04	\$73		
2	20	Support Staff	ELEC FV	16	\$46.04	\$73		
	21	Support Staff	CAD/ ADMIN	18	\$37,25	\$59		
940		GANNETT FLEMING		SHREAD RATE	189,17%			
TECHNICAL STAFF								
	1	Richard Cross, PE	DPM	0	\$105.40	5		
	2	David Howelt, PE Bruce Smith	Rail Bys. Lead Quality Control	0	\$64.70	3		
	3			5	\$63.80	3		
	4	Robert Matthews, PE	Civil Laad	C	\$79.20	\$		
	3	Sleven Zapoliczny, PE	Site/Civil	C	\$43.70			
	6	Agniesztika Lapinski, PE	Sr Structural	12	\$72.00	\$88		
	7	John Legath, PE	Track	36	\$54.10	\$2,30		
	8	Terry Shantz, PE	Cat/ Trans	0	399.20	\$		
	9	Bryen Shober, PE	Cal/ Trans	2	\$84.30	\$16		
	10	Greg Nazarow	Rail Ops	0	\$79.20			
	11	lan Martin	Rail Ops	0	\$78.60	5		
	2	Neil Water	Comma	0	\$73.70	\$		
	13	James Sgro	Comms	0	\$90.00	5		
	14	Theodore Bandy, PE	Sys. Integ.	- 4	\$100.00	\$40		
	15	Stephen Barkovich	Sys. Integ	0	\$59.10	5		
	16	Richard Lentz	Signata	0	\$81.90	3		
1	7	Joseph Bonaduce	Signals	0	\$100.70	\$		
	18	Abraza Edraki, PE, PMP	Salety & Sec.	0	\$99.60	3		
1	18	McEwan van der Mandele, CPP	Salety & Sec.	0	\$77.70	5		
	9	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30	3		
	-	SUPP	ORT STAFF			-		
2	20	Technical Support Staff	Eng. Steff	117	\$50.37	\$5.89		
2	21	Administrative Support Statt HALEY & ALDRICH	CADY ADMIN	70	\$43.14	\$3,02		
1000	-			ERHEAD RATE	220.84%	-		
			ICAL STAFF			-		
	1	Ed Zammakie, PE	Lead Geolechnical Eng.	0	\$84.06			
	2	Project Engineer	Project Engineer	0	\$60.60	5		
1	3	Engineering Steff	Eng Staff	0	\$50,09	\$		
	4	Junior Engineering Staff	Jr. Eng Staff	0	\$34.99	i		
		SUPP	ORT STAFF					
F	5	CADD/ Project Assestant	CADY ADMEN	0		9		
1		GROFFIN ENGINEERING		STREAD RATE	182.30%			
		TECHN	ICAL STAFF					
F	-	PEGGP	NAME OF ALL					

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY
		NAIK CONSULTING GR	V0 900	RHEADRATE	127.09%	
		TE	CHINICAL STAFF			
	1	John Tan, PE	PM	0	\$90.56	\$0
	2	Rich Baron	SURV PM	0	\$58.30	\$0
	3	Project Surveyor	SURV Proj. Surv.	D	\$47.50	
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0 \$0
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45,79	\$0
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37,79	\$0
	9	Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0
U	-	54	JPPORT STAFF			
M	_11	CAD Manager	CAD Mgr	0	\$58 19	50
Z	12	CAD Technicians	CAD Tech	0	\$30.54	\$0 \$0
100		ENVISION	OV	RHEAD RATE	137.51%	
			CHNICAL STAFF			
		Kurt Buettler	Doc. Ctrl. Mgr	0	\$42.00	\$0
zl	2	Thomas Hartley	VE Team Lead	204	\$94.40	\$19,258
오	3	Configuration Management	Config. Mgmi	Ó	\$55.00	\$0
뗥	- 4	Value Engineering Team	VE Team	256	\$75.52	\$19,333
ENVISION			PPORT STAFF			
Ш	5	Administration	Admin	56		\$1 196
	1000	JCMS		RHEADRATE	117.32%	
	-		CHNICAL STAFF			
2		K. Meehan	Senior Est.	16	\$63.67	\$1,019
JCMS	2	Junior Estimator	Junion Est	0	\$46.20	\$0
3	_3	Project Controls	PC	0	\$57 75	\$0
		RADIN		RHEAD RATE	155.17%	
- 1			CHNICAL STAFF			
٤i	-1	Chtra Radin	Disc. Lead	-0	\$100.00	\$0
RADIN			IPPORT STAFF			
5	2	Beth Uczynski	CADIV	0	\$38.21	\$0
		SJH		RHEAD RATE	140.00%	-
11	-		CHINICAL STÀFF			
		S Jayakumaran	Civil Eng VIII	0	\$84.24	\$0
튌	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0 \$0
Ø.	3	Engineering Staff	Eng Staff	0	\$40.43	\$0

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	933		-
Total Salary			\$64,366
Overhead			\$93,214
Subtotal			\$157,580
Fixed Fee		10%	\$15,758
Total Direct Costs			\$16,520
TOTAL COST		-	\$189.858

TASK:		STIMATE BY INDIVIDUA							
			FIRM:						
4.11	NEPA Coordination		H&H / GANN	ETT FLEMING	JV				
NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR				
030-03	HARDESTY & HANOVER		ERHEAD RATE	157,40%					
TECHNICAL STAFF									
	Visha Szumanski, PE	PM, STR Eng VIII	0		\$				
_2	Charlie Geer, PE	Risk Manager	0	\$98.01	\$				
3	David Tuckman, PE	OPM. STR Eng VII	0	\$81.81	\$				
4	Steve Harlacker, PE, SE	OAQC, STR Eng VI	0	\$72.32	5				
5	Steve Hom, PE	STR Eng VII	0	\$80.39	\$				
6	Peter Roody, PE	STR Eng VII	12	\$86.51	\$1,03				
7	Michael Hawkins, PE	STR Eng Viti	Ó	\$106.14	\$				
8	Steve Mikucki, PE	MECH Eng VII	0	\$86.43	5				
10	Alex Noble, PE	ELEC Eng VI	0	\$70.29	\$				
11	Paul Connolly, PE Gien Schetelich, PE	STR Eng VII	0	\$80.09	\$				
		STR Eng VIII	104	\$109,79	\$11,41				
12	Raymond Mankbadt, PE Mishac Yegian, PE, PhD	STR Eng VID	0	\$86.58	\$				
-14	David Marcic, PE, SE	STR Eng VIII STR Eng VI	0	\$76.13	\$				
15	Jerry DiMaggio.PE		0	\$72.55	\$				
16	David Gerber, PE	STR Eng Vill	-	\$78.13	\$				
17	Drew DelleDonne, RA	STR Eng VI STR Eng VI	0	\$75.63	\$				
<u> </u>		ORT STAFF		\$09.63	<u> </u>				
18	Support Staff	STRIV	60	\$46.04	40.50				
19	Support Staff	MECHIV	0	\$46.04	\$2.76				
20	Support Staff	ELEC I-V	0	\$46.04	S				
21	Support Staff	CAD/ ADMIN	24	\$37,23	585				
	GANNETT FLEMING			159,17%	309				
	GANNE I I FLEMING OVERHEAD RATE 189,17%								
	David Howell, PE		0	\$105.40	\$12.42				
3	Bruce Smith	Rail Sys. Lead Quality Control	192	\$64.70 \$63.80	\$12,42				
4	Robert Metthews, PE	Civil Lead		\$79,20					
5	Steven Zapoticzny, PE	Site/Civil		\$43.70					
-6	Agnieszkka Lapinski, PE	Sr Structural	0	\$72.00					
7	John Legath, PE	Track	8	\$72.00	\$51				
1 a	Terry Shantz, PE	Cel/ Trans	0	\$99.20	3-31.				
9	Bryan Shober, PE	Cev Trans	0	\$84.30					
10	Greg Nazarow	Rail Ops	2	\$79,20					
	Ian Martin	Rail Ops	2		\$15				
12	Net Water	Comms	-	\$76.60	315				
13	James Soro	Comms	0	\$90.00					
14	Theodore Bandy, PE	Sys. Integ.	0	\$90.00	\$				
15	Slephen Barkovich	Sys. Integ.	0		\$(
1.0	Richard Lentz			\$59.10	54 54				
14									
16		Signals	0	\$81.90					
17	Joseph Bonaduce	Signats	Ö	\$100.70	\$				
17 18	Joseph Bonaduce Alireza Edraki, PE, PMP	Signals Safety & Sec.	0	\$100.70 \$99.60					
17 18 18	Joseph Bonaduce Alreza Edraki, PE, PMP McEwan van der Mandele, CPP	Signals Safety & Sec. Safety & Sec.	0	\$100.70 \$99.60 \$77.70					
17 18	Joseph Bonaduce Aireza Edraki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE	Signals Safety & Sec. Safety & Sec. Hydraulics & Hydrology	0	\$100.70 \$99.60					
17 18 18 19	Joseph Bonaduce Aireza Edraki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP	Signals Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT STAFF	0 0 0	\$100.70 \$99.60 \$77.70 \$73.30	\$4 \$4 \$4 \$4 \$4 \$4				
17 18 19 20	Joseph Bonaduce Alreza Edraki, PE, PMP MCEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff	Signais Safety & Sec. Safety & Sec. Hydrauecs & Hydrology ORT STAFF Eng. Staff	0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37	54 54 54 54 54 54 54 54 54 54				
17 18 19 20	Joseph Bonaduce Aireza Edraki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP	Signals Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT STAFF Eng. Staff CAD' ADMIN		\$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.14	54 54 54 54 54 54 54 54 54 54				
17 18 19 20	Joseph Bonaduce Airoza Editaki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff HALEY & ALURICH	Signata Safety & Sec. Hydrautes & Hydrology ORT STAFF Eng. Staff CACV ADMIN	0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37	54 54 54 55				
17 18 18 19 20 21	Joseph Bonaduce Alraza Egraki, PE, PMP MCEwan van der Mandete. CPP Ramesh Rajagopal, PE SupPr Technical Support Staff Administrative Support Staff HALLEY & ALLDRICH TECHNIC	Signals Safety & Sec. Hydraulics & Hydrology ORT STAFF Eng. Staff CADY ADMIN ICAL STAFF	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.14 \$20.34%	\$0 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1				
17 18 18 19 20 21	Joseph Bonsouce Aireza Egraki, PE, PMP MCEven van der Nandele. CPP Ramesh Rajagopal, PE SuPP Technical Support Staff Administrative Support Staff MALLEY & ALDRICH TECHN Ed Zaminskie, PE	Signals Safety & Sec. Hydrautes & Hydrology ORT STAFF Eng. Starf CAD/ ADMIN OVE ICAL STAFF Laad Geotechnical Eng.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.14 \$220,34% \$84.06	\$0 \$0 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1				
17 18 19 20 21 1	Joseph Bonaduce Aaraza Edraki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE Supp Technical Support Staff Administrative Support Staff HALEY & ALDRICH Ed Zaminiske, PE Project Engineer	Signals Safety & Sec. Safety & Sec. Hydraulics & Hydrology OHT STAFF Eng. Staff CAC ADMIN OVE ICAL STAFF Lasd Geolechnical Eng. Project Engineer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.14 \$20.34% \$84.06 \$60.60	\$4 \$4 \$4 \$4 \$4 \$4 \$4 \$4 \$4 \$4 \$5 \$5 \$5 \$5				
17 18 19 20 21 1 20 21 1 2 3	Joseph Bonaduce Alraza Egraki, PE, PMP MCEwan van der Mandele. CPP Ramesh Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff HALLEY & ALURICH Ed Zaministice, PE Project Engineer Engineering Staff	Signals Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT STAFF Eng. Staff CADY ADMIN ICAL STAFF Lasd Geotechnical Eng. Project Engineer Eng Staff	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.14 \$20.34% \$84.06 \$60.60 \$50.69	54 54 54 54 54 54 54 54 54 54 54 54 54 5				
17 18 19 20 21 1 20	Joseph Bonsouce Alinza Edraki, PE, PMP MCEwar van der Mandele. CPP Ramesh Rajagopal, PE SuPP Technical Support Staff Administrative Support Staff HALLEY & ALLURICH Ed Zaminskie, PE Project Engineer Engineering Staff Junior Engineering Staff	Signals Safety & Sec. Safety & Sec. Hydrautes & Hydrology ORT STAFF Eng. Starf CADY ADMIN OVE CALD STAFF Load Geolechnical Eng. Project Engineer Eng Staff La Eng Staff	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$50.37 \$43.14 \$20.34% \$84.06 \$60.60	54 54 54 54 54 54 54 54 54 54 54 54 54 5				
17 18 18 19 20 21 1 2 3 4	Joseph Bonaduce Aliroza Edraki, PE, PMP McEwar van der Mandele, CPP Ramesh Rajagopal, PE BuPP Technical Support Staff Administrative Support Staff MALLEY & ALDRICH Ed Zaminskie, PE Project Engineer Engineering Staff Junior Engineering Staff	Signals Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT STAFF Eng. Staff CAD: ADMIN OVE ICAL STAFF Laad Geotechnical Eng. Project Engineer Eng Staff Jr Eng Staff ORT STAFF	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$43.14 \$20.34% \$44.06 \$60.60 \$30.69 \$34.99	30 34 35 35 35 35 35 35 35 35 35 35 35 35				
17 18 18 19 20 21 1 2 3 4	Joseph Bonaduce Aliroza Edraki, PE, PMP McEwar van der Mandele, CPP Ramesh Rajegopal, PE BUPP Technical Support Staff Administrative Support Staff MALEY & ALDRICH Ed Zaminskie, PE; Project Engineer Engineering Staff Junior Engineering Staff	Signals Safety & Sec. Safety & Sec. Hydrautics & Hydrology ORT STAFF Eng. Staff CADY ADMIN OVE ICAL STAFF Used Geolechnical Eng. Project Engineer Eng Staff Jr Eng Staff ORT STAFF CADY ADMIN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$43.14 220.34% \$44.06 \$60.60 \$50.69 \$34.99 \$34.99 \$30.30	30 34 35 35 35 35 35 35 35 35 35 35 35 35				
17 18 18 19 20 21 1 2 3 4	Joseph Bonaduce Alinza Edraki, PE, PMP MCEven van der Mandele. CPP Ramesh Rajagopal, PE SuPP Technical Support Staff Administrative Support Staff HALLEY & ALLDRICH TECHN Ed Zaminskie, PE Project Engineer Engineering Staff Junior Engineering Staff SUPP CADCY Project Assistant SUPP	Signals Safety & Sec. Safety & Sec. Hydrautics & Hydrology ORT STAFF Eng. Staff CADY ADMIN OVE ICAL STAFF Used Geolechnical Eng. Project Engineer Eng Staff Jr Eng Staff ORT STAFF CADY ADMIN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$100.70 \$99.60 \$77.70 \$73.30 \$43.14 \$20.34% \$44.06 \$60.60 \$30.69 \$34.99	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$				

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY		
	-	NAIK CONSULTING GR	002 001	ERHEAD RATE	127,09%	-		
10	-		CHINICAL STAFF					
		John Tan, PE	PM	0	\$90.56	\$0		
		Rich Baron	SURV PM	0.	\$58,30	50		
		Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0 \$0		
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0		
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0		
	6	Ron Rotunno, PE	UTIL, Mgr	0	\$74.66	\$0		
	7	Senior Utity Engineer	UTIL Sen. Eng.	0	\$45.79	\$0		
		Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	50		
	9	Senior Structural Engineer	STR Sett. Eng.	0	\$54.50	\$0		
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	SÓ		
2	-	51	JPPORT STAFF	_				
NAIK	11	CAD Manager	CAD Mor	0	\$58 19	\$0		
Ž	12	CAD Technicians	CAD Tech	0	\$30,54	\$0		
	ENVISION OVERHEAD RATE 137.51%							
	TECHNICAL STAFF							
		Kurt Suettler	Doc. Ctrl. Mgr	0	\$42.00	\$0		
z		Thomas Hariley	VE Team Lead	0	\$94.40	\$0		
Q	3	Configuration Management	Config. Mgmt.	0	\$55.00	\$0		
5	4	Velue Engineering Team	VE Team	0	\$75.52	\$0		
ENVISION			JPPORT STAFF					
Ē	5	Administration	Admin	0	\$21.40	\$0		
TO	1.7	JCMS		ERHEAD RATE	117.32%			
			CHNICAL STAFF	-				
ŝ	1	K. Meehan	Senior Est.	0	\$63.67	\$0		
JCMS		Junior Estimator	Junion Est.	Ó	\$46.20	\$0		
×.	3	Project Controls	PC	0	\$57.75	\$0		
	-	RADIN	OVE	RHEAD RATE	155.17%			
1.44			CHNICAL STAFF		-			
ŝ	1	Chitra Radin	Disc. Lead	0	\$100.001	\$0		
RADIN			JPPORT STAFF					
2	_2	Beth Uczynski	CADIV	0	\$38.21	\$0		
100	5	SJH	ove	RHEAD RATE	140.00%			
5	-		CHINICAL STAFF			-		
1	1	S. Jayakumaran	Civil Eng VIII	0	\$84.24	\$0		
Hrs	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0		
က်	3	Engineering Staff	Eng Staff	-0	\$40.43	50		

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	404		
Total Salary			\$29,351
Overhead			\$45,44
Subtotal			\$75,80
Fixed Fee		10%	\$7,58
Total Direct Costs			50
TOTAL COST		-	\$83,384

4.12A Design Criteria H&H / GANNETT FLEMING_JV NO. PRESON NAME PROJECT TITLE / DISCIPLINE ESTIMATED HOURLY RATE TOTAL SALA HARDES 1Y & HARNOVER OVERHEAD RATE 157,40% TOTAL SALA HARDES 1Y & HARNOVER OVERHEAD RATE 157,40% TOTAL SALA 1 Vista Sumanski, PE PM, STR Eng VII 0 \$96,86 2 Charle Geer, PE Risk Manager 0 \$90,86 3 David Tuckman, PE OPM, STR Eng VII 0 \$80,81 4 Steve Hancker, PE, GE OAXC, STR Eng VII 0 \$80,51 \$8 6 Peter Rody, PE STR Eng VII 0 \$80,63 \$8 7 Mitchael Hawkina, PE STR Eng VII 0 \$80,65 \$8 10 Paul Connoby, PE STR Eng VII 0 \$80,65 \$8 11 Glen Schelach, PE STR Eng VII 0 \$76,53 \$17 12 Regmont Mankback, PE STR Eng VII 0 \$76,53 \$17 <th></th> <th></th> <th>STIMATE BY INDIVIDUA</th> <th></th> <th></th> <th>1</th>			STIMATE BY INDIVIDUA			1		
NO. PERSON MAME PROJECT TITLE / DISCIPLINE ESTIMATED HOURLY RATE TOTAL SALA HARDES IT & HANUOYEN OVERREAD RATE 197,40% 1 Visha Szumánski, PE PA, STR Eng VIII 0 306 66 2 Charle Gerr, PE Riak Manager 0 306 66 3 Devid Tuckman, PE CPU, STR Eng VII 0 380 38 4 Steve Harlacker, PE, SE CASC, STR Eng VII 0 380 39 5 Steve Hom, PE STR Eng VII 0 380 39 6 Peter Roody, PE STR Eng VII 0 380 39 7 Michael Hawkin, PE STR Eng VIII 0 380 59 10 Pate Connoly, PE STR Eng VIII 0 380 59 11 Gen Sorteskch, PE, SE STR Eng VIII 0 380 59 12 Raymond Mankbad, PE, STR Eng VIII 0 376 13 14 David Gender, PE, SSTR Eng VII 0 376 13 15 13 Mishake Veglan, PE, PhO STR Eng VII 0				FIRM:				
IPO. PROJECT TILE / DISCRUCH HOURS HOURS HOURS HOURS TOTAL SALA I Visha Szumanski, PE PA, STR Eng VIII 0 306.86 2 Charle Gerr, PE Risk Manager 0 306.86 3 David Tockmun, PE CPM, STR Eng VII 0 381.61 4 Steve Hancker, PE, SE CAX2, STR Eng VII 0 380.51 48 6 Netro Hancker, PE, SE CAX2, STR Eng VII 0 380.51 48 7 Mitchael Hawkins, PE STR Eng VIII 0 380.63 48 9 Axex Noble, PE ELEC Eng VII 0 380.69 48 10 Paid Connobly, PE STR Eng VIII 0 380.69 48 11 Gens Anabadi, PE STR Eng VIII 0 380.69 48 12 Reymond Mansbadi, PE STR Eng VIII 0 370.29 53 13 Manbac Yeglan, PE, PhO STR Eng VIII 0 370.23 51 14 <t< th=""><th>4.12</th><th>ZA Design Criteria</th><th></th><th>H&H / GANN</th><th>ETT FLEMING</th><th>JV</th></t<>	4.12	ZA Design Criteria		H&H / GANN	ETT FLEMING	JV		
TECHNICAL STRE FG VIII 0 SIR EG VIII 0 SIR EG VIII 0 SIR EG VIII 0 SIR EG VII O SIR EG VIII O SIR EG VIII O SIR EG VIII O SIR EG VIII O SIR EG VIIII O <th colspan="2" sir<="" th=""><th>NO</th><th></th><th>PROJECT TITLE / DISCIPLINE</th><th></th><th>HOURLY RATE</th><th>TOTAL SALAR</th></th>	<th>NO</th> <th></th> <th>PROJECT TITLE / DISCIPLINE</th> <th></th> <th>HOURLY RATE</th> <th>TOTAL SALAR</th>		NO		PROJECT TITLE / DISCIPLINE		HOURLY RATE	TOTAL SALAR
1 Visha Szumanski, PE PM, STR Erg VIII 0 968 66 2 Charke Geer, PE Risk Manager 0 506 61 3 Darket Tuckman, PE DPAL, STR Erg VII 0 357, 53 4 Sizev Hom, PE STR Erg VII 0 357, 53 5 Sizev Hom, PE STR Erg VII 0 380, 39 6 Pater Roody, PE STR Erg VII 0 380, 51 7 Michael Harwin, PE STR Erg VII 8 50, 50, 14 84 7 Michael Harwin, PE STR Erg VII 8 360, 51 51 9 Arex Noble, PE ELEC Erg VI 0 340, 50 51 10 Brais Someaka, PE STR Erg VII 0 340, 50 51 13 Mathacked, PE STR Erg VII 0 376, 53 51 13 Mathacked, PE STR Erg VII 0 376, 53 51 14 David Marck, PE, SE STR Erg VII 0 376, 53 51 <				ERITEAU RATE	157,40%			
2 Chafter Gerr, PE Risk Manager 0 \$\$6001 3 Devid Tuchnam, PE OPM, STR Eng VII 0 \$\$1511 4 Sieve Haracher, PE, SE OAOC, STR Eng VII 0 \$\$12337 5 Sieve Haracher, PE, SE STR Eng VII 0 \$\$100, \$\$101, \$\$100, \$								
3. Devid Tuckman, PE DPM, STR Eng VII 0 \$\$12,32] 5. Silver Hom, PE, EE CADC, STR Eng VII 0 \$360,36] 6. Peter Roody, PE STR Eng VII 10 \$366,51 \$41 7. Michael Handhan, PE STR Eng VIII 10 \$366,51 \$41 7. Michael Handhan, PE STR Eng VIII 10 \$366,51 \$41 9. Alex Noble, PE ELEC Eng VII 16 \$866,43 \$42 9. Alex Noble, PE ELEC Eng VII 10 \$360,059 \$11 \$68 \$370,229 \$41 10. Paul Connoby, PE STR Eng VII 0 \$367,53 \$41 11. Glen Schelskich, PE STR Eng VII 0 \$376,53 \$41 13. Mishaek Yegan, PE, PDO STR Eng VII 0 \$376,63 \$17 13. Mishaek Yegan, PE, PDO STR Eng VII 0 \$376,63 \$17 14. David Marcic, PE, SE STR Eng VII 0 \$366,63						\$		
4 Stave Harischer, PE, SE OAOC, STR Eng VII 0 \$32,33 5 Steve Hom, PE STR Eng VII 0 \$300,39 6 Peter Roody, PE STR Eng VII 10 \$306,51 \$4 7 Michael Hawkins, PE STR Eng VII 8 \$100,41 \$8 \$100,41 \$8 8 Steve Mikucki, PE ELEC Eng VII 8 \$100,20 \$8 \$100,20 \$8 10 Paid Connoly, PE STR Eng VII 0 \$100,20,20 \$8 11 Glen Schelskch, PE STR Eng VIII 6 \$100,275 \$13 12 Raymond Markbadl PE STR Eng VIII 0 \$17,33 \$1 14 David Gender, FE STR Eng VIII 0 \$17,33 \$1 16 David Gender, FE STR Eng VIII 0 \$16,63 \$17 17 Drew Deleborne RA STR Eng VIII 0 \$16,64 \$2 17 Drew Deleborne RA STR Eng VIIII 0 \$16,64						\$		
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13 James Sgro Comms 0 \$90.00 14 Theodore Bandy, PE Sys. Integ. 0 \$100.00 18 Stephen Barkovich Sys. Integ. 0 \$100.00 18 Stephen Barkovich Sys. Integ. 0 \$591.00 19 Richard Lentz Signats 0 \$591.00 10 Richard Lentz Signats 0 \$100.70 18 Stephen Barkovich Sys. Integ. 0 \$100.70 18 Attract Editaki, PE, PMP Sefety & Sec. 0 \$77.70 19 Ramesh Rajagopal, PE Hydraukca & Hydrology 0 \$73.30 SUPPORT Staff Eng. Staff 221 \$50.37 \$1.1 20 Technical Support Staff CAD ADMIN 0 \$43.14 Hydraukca & Hydrology OVERHEAD RATE 220.34% TECHNICAL STAFF OVERHEAD RATE 220.34% TECHNICAL STAFF SUPPORT Staff	12	Neil Wälter						
14 Theodore Bandy, PE Sys. Integ. 0 \$100.00 15 Stephen Barkovich Sys. Integ. 0 \$5100.00 16 Richard Lentz Signats 0 \$510.00 17 Joseph Bnaduce Signats 0 \$510.00 18 Alreza Edraki, PE, PMP Safety & Sec. 0 \$98.60 18 Alreza Edraki, PE, PMP Safety & Sec. 0 \$98.60 18 Alreza Edraki, PE, PMP Safety & Sec. 0 \$97.70 18 Ramesh Rajagopal, PE Hydraulics & Hydrology 0 \$77.70 19 Ramesh Rajagopal, PE Hydraulics & Hydrology 0 \$77.70 20 Technical Support Staff Eng. Staff 22 \$50.37 \$1.1 21 Administrative Support Staff Eng. Staff 0 \$43.14 \$43.14 MECHNICAL STAFF 1 Ed Zaminskie, PE Lead Geotechnical Eng. 0 \$40.05 2 Project Engineer Froject Engineer \$50.60 <td>13</td> <td>James Spro</td> <td></td> <td></td> <td></td> <td>5</td>	13	James Spro				5		
15 Stephen Barkovich Sys. Integ. 0 S59 (0) 16 Richard Leniz Signats 0 S59 (0) 17 Joseph Bonaduce Signats 0 \$60 70 18 Alireza Edraki, PE, PMP Sefety & Sec. 0 \$50 70 18 Alireza Edraki, PE, PMP Sefety & Sec. 0 \$577.70 19 McEwan van der Mandele, CPP Isafety & Sec. 0 \$77.70 19 Ramesh Rajeopal, PE Hydraukis & Hydrology 0 \$77.70 19 Ramesh Rajeopal, PE Hydraukis & Hydrology 0 \$77.70 20 Technical Support Staff Eng. Staff 22! \$50.37 \$11 21 Administrative Support Staff CAD/ ADMIN 0 \$43.14 HALE Y & ALDRICH TECHNICAL STAFF 20.34% TECHNICAL STAFF 1 Ed Zaminske, PE Lead Geotechnical Eng 0 \$40.06 2 Project Engineer Project Engineer \$60.60 \$34.06 3 Engineering Staff	14							
HALEY & ALDRICH Description TECHNICAL STAFF OVERHEAD RATE 1 Ed Zaminskie, PE Lead Geolechnical Eng. 2 Project Engineer Project Engineer 3 Engineering Staff Cl. Staff 4 Junior Engineering Staff Junior Engineering Staff 5 CADDY Project Assistant [CADY ADJAMIN] 6 Staff O 5 CADDY Project Assistant [CADY ADJAMIN] 0 \$30.30] GRIFFIN ENGINEERIENG OVERHEAD RATE 1 Ectivical Staff	15					5		
HALEY & ALDRICH DVERHEAD RATE 220,34% TECHNICAL STAFF TECHNICAL STAFF 220,34% 1 Ed Zaminskie, PE Lead Geolechnical Eng 0 \$\$4,06] 2 Project Engineer Project Engineer 6 \$60,60] 3 Engineering Staff Eng Staff 0 \$34,66] 4 Junior Engineering Staff Jk. Eng Staff 0 \$34,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$33,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$30,30] GRIPPTIN ENGINEERING OVERHEAD RATE 182,30% TECHNICAL STAFF	16	Richard Lentz						
HALEY & ALDRICH DVERHEAD RATE 220,34% TECHNICAL STAFF TECHNICAL STAFF 220,34% 1 Ed Zaminskie, PE Lead Geolechnical Eng 0 \$\$4,06] 2 Project Engineer Project Engineer 6 \$60,60] 3 Engineering Staff Eng Staff 0 \$34,66] 4 Junior Engineering Staff Jk. Eng Staff 0 \$34,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$33,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$30,30] GRIPPTIN ENGINEERING OVERHEAD RATE 182,30% TECHNICAL STAFF	17					5		
HALEY & ALDRICH DVERHEAD RATE 220,34% TECHNICAL STAFF TECHNICAL STAFF 220,34% 1 Ed Zaminskie, PE Lead Geolechnical Eng 0 \$\$4,06] 2 Project Engineer Project Engineer 6 \$60,60] 3 Engineering Staff Eng Staff 0 \$34,66] 4 Junior Engineering Staff Jk. Eng Staff 0 \$34,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$33,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$30,30] GRIPPTIN ENGINEERING OVERHEAD RATE 182,30% TECHNICAL STAFF	18							
HALEY & ALDRICH DVERHEAD RATE 220,34% TECHNICAL STAFF TECHNICAL STAFF 220,34% 1 Ed Zaminskie, PE Lead Geolechnical Eng 0 \$\$4,06] 2 Project Engineer Project Engineer 6 \$60,60] 3 Engineering Staff Eng Staff 0 \$34,66] 4 Junior Engineering Staff Jk. Eng Staff 0 \$34,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$33,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$30,30] GRIPPTIN ENGINEERING OVERHEAD RATE 182,30% TECHNICAL STAFF	18							
HALEY & ALDRICH DVERHEAD RATE 220,34% TECHNICAL STAFF TECHNICAL STAFF 220,34% 1 Ed Zaminskie, PE Lead Geolechnical Eng 0 \$\$4,06] 2 Project Engineer Project Engineer 6 \$60,60] 3 Engineering Staff Eng Staff 0 \$34,66] 4 Junior Engineering Staff Jk. Eng Staff 0 \$34,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$33,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$30,30] GRIPPTIN ENGINEERING OVERHEAD RATE 182,30% TECHNICAL STAFF	19							
HALEY & ALDRICH DVERHEAD RATE 220,34% TECHNICAL STAFF TECHNICAL STAFF 220,34% 1 Ed Zaminskie, PE Lead Geolechnical Eng 0 \$\$4,06] 2 Project Engineer Project Engineer 6 \$60,60] 3 Engineering Staff Eng Staff 0 \$34,66] 4 Junior Engineering Staff Jk. Eng Staff 0 \$34,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$33,99] 5 CADDY Project Assistant [CADY ADMIN 0 \$30,30] GRIPPTIN ENGINEERING OVERHEAD RATE 182,30% TECHNICAL STAFF				~	010.00			
HALEY & ALLPRICH OP Joint Joint 1 Ed Zaminskie, PE Laad Geolechnical Eng 0 \$\$4.08] 2 Project Engineer Project Engineer 0 \$\$4.08] 3 Engineering Staff Eng Staff 0 \$\$4.08] 4 Junior Engineering Staff 0 \$\$34.99] 5 CADDr Project Assistant CAD/ADMIN 0 \$\$30.50] GRIFFIN ENKINEEKING TECHNICAL STAFF 152.30%	20			22	\$50.37	\$1.40		
HALEY & ALDRICH DVERHEAD RATE 220,34% TECHNICAL STAFF TECHNICAL STAFF 220,34% 1 Ed Zaminskie, PE Lead Geolechnical Eng 0 \$\$4,06] 2 Project Engineer Project Engineer 6 \$60,60] 3 Engineering Staff Eng Staff 0 \$34,66] 4 Junior Engineering Staff Jk. Eng Staff 0 \$34,96] 5 CADDY Project Assistant [CADY ADMIN 0 \$33,99] 5 CADDY Project Assistant [CADY ADMIN 0 \$30,30] GRIPPTIN ENGINEERING OVERHEAD RATE 182,30% TECHNICAL STAFF	21	Administrative Support Staff	CADY ADMIN	44		\$1.10		
TECHNICAL STAFF 1 [Ed Zaminskie, PE [Last Geolechnical Eng 0 \$\$4.06] 2 Project Engineer Project Engineer 0 \$60.60] 3 Engineering Staff Eng Staff 0 \$34.99] 4 Junior Engineering Staff Junior Engineering Staff 0 \$33.499] 5 CADDr Project Assistant [CAD/ADIAIN 0 \$33.30] GRIFFIN ENGINEERING TECHNICAL STAFF 0 \$30.30]	1	HALLEY & ALLURICH		101120112012				
1 Ed Zammskie, PE Lead Geolechnical Eng 0 \$84.08 2 Project Engineer 0 \$60.60 3 Engineering Staff Eng Staff 0 \$30.69 4 Junior Engineering Staff L. Eng Staff 0 \$34.99 5 [CADD/ Project Assistant [CADD/ Project Assistant 0 \$30.30 GROPPIN ENGINEERUNGS TECHNICAL STAFF				a starter to the	200.0% N			
2 Project Engineer 0 \$60.60 3 Engineering Staff Engineering Staff 0 \$50.69 4 Junior Engineering Staff 0 \$34.99 5 CADDr Project Assistant CAD/ADMIN 0 \$30.30 GRIFFIN ENGINEERING OVERHEAD RATE 1\$2.30% TECHNICAL STAFF	1			6	111 741			
3 Engineering Staff Eng Staff 0 350.69 4 Junior Engineering Staff Jr. Eng Staff 0 \$34.99 5 CADD? Project Assistant [CAD? ADMIN 0 \$30.30 GROPPTIN ENGINEERING OVERHEAD RATE 1\$2.30% TECHNICAL STAFF	· ·					د ۱		
4 Junior Engineering Staff Jr. Eng Staff 0 \$33 99 SUPPORT STAFF 5 CADDr Project Assistant (CADA ADMIN) 0 \$30 30 5 ICADDr Project Assistant (CADA ADMIN) 0 \$30 30 GRIFFIN ENGINEERUNG OVERHEAD RATE 1\$2.30% TECHNICAL \$7AFF 152.30%				-		-		
SUPPORT STAFF SUPPORT STAFF SUPPORT STAFF GRUPPORT ASSISTENT ICADIX Project Assistent ICADIX ICAD						\$		
GRIFFIN ENGINEERING OVERHEAD RATE 182.30%				0	\$34,99]	\$		
GRIFFIN ENGINEERING OVERHEAD RATE 182.30%								
TECHNICAL STAFF	<u> </u>					5		
				HILLAD RATE	152.30%	-		
1 Joe Griffin, PE Const. Rev. 0 \$90,00	1		ICAL STAFF	-	\$90.00	54		

	NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS		TOTAL SALARY			
121	-	NAIK CONSULTING GR	OUP OV	RHEAD RATE	127.09%				
			CHINICAL STAFF						
	1	John Tan, PE	PM	0	\$90.56	\$0			
	2	Rich Baron	SURV PM	0	\$58,30	\$0			
	3	Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0			
	4	Party Chief	SURV Inst. Tech.	0	\$37.21	\$0 \$0 \$0 \$0 \$0			
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0			
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0			
	7	Senior Utity Engineer	UTIL Sen. Eng.	0	\$45,79	\$0			
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37 79	\$0			
		Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0			
0.0	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0			
2			JPPORT STAFF						
NAK		CAD Manager	CAD Mgr	0	\$58.19	\$0			
Z	12	CAD Technicians	CAD Tech	0	\$30.54	\$0			
100	ENVISION OVERHEAD RATE 137,51%								
	_		CHNICAL STAFF						
	1	Kurt Buettler	Doc. Ctrl. Mgr	0	\$42.00				
z		Thomas Hartley	VE Team Lead	Ŏ	\$94.40	\$0 \$0			
2	-3	Configuration Management	Config. Mgmil.	0	\$55.00	\$0			
ENVISION	4	Value Engineering Team	VE Team	0	\$75.52	\$0			
I≩			IPPORT STAFF						
W	5	Administration	Admin	0	\$21.40	\$0			
	-	JCMS		RHEAD RATE	117.32%				
10			CHINICAL STAFF						
JCMS	1	K. Meehan	Senior Est.	0	\$63.67	\$0			
3	2	Junior Estimator	Junion Est.	0	\$46.20	\$0			
5	3	Project Controls	PC	0	\$57 75	\$0			
	-	RADIN		RHEAD RATE	155.17%				
-	-		CHNICAL STAFF						
둜	1	Chitra Radin	Oisc. Lead	0	\$100.00	\$0			
RADIN			JPPORT STAFF						
	2	Beth Uczynski		0	\$38.21	\$0			
	-	SJH		RHEAD RATE	140.00%				
			CHINICAL STAFF						
	1	S. Jayakumaran	Civil Eng VIII	D	\$84.24	\$0			
Hrs	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0			
φ3	3	Engineering Staff	Eng. Staff	0	\$40.43	\$0			

TEAM SUMMA	RY		
TOTAL ESTIMATED HOURS	100		
Total Salary			\$7,632
Overhead			\$12.073
Subtotal			\$19,704
Fixed Fee		10%	\$1.971
Total Direct Costs			\$0
TOTAL COST			\$21,676

	TASK:		STIMATE BY INDIVIDUA	FIRM:				
I		Bridge Design	H&H / GANNETT FLEMING JV					
	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR		
I		HARDESTY & HANOVER		ERHEAD RATE	187,40%	Si der		
ł			IICAL STAFF		-			
ł	1	Visha Szumanski, PE	PM, STR Eng VIII	0	\$95.86	3		
ł	2	Charle Geer, PE	Risk Manager	0	\$96.01	4		
ł	3	David Tuckman, PE	DPM, STR Eng VII	0	\$81.81			
ł	-	Steve Hartacker, PE, SE	QAQC, STR Eng VI	0	\$72.32			
ł	5	Steve Hom, PE	STR Eng VII	0	\$80.39			
ł	6	Peter Roody, PE	STR Eng VIII	200	\$86.51	\$17.30		
ł	7	Michael Hawkins, PE Sleve Mikucki, PE	STR Eng VIII	200	\$106.14	\$21.22		
ł	9		MECH Eng VII	140	\$86.43	\$12,10		
ł	10	Alex Noble, PE Paul Connolly, PE	ELEC Eng VI	140	\$70.29	\$9.84		
ł	11	Glen Schetelich, PE	STR Eng VII	172	\$80.09	\$13,77		
ł			STR Eng VIII	0	\$109.79			
ŀ	12	Raymond Mankbadi, PE Mishac Yegian, PE, PhD	STR Eng VIII	80	\$86.58	\$6.97		
ł	14	David Marcic, PE, SE	STR Eng VIII	105	\$78.13	17.00		
ł	15	Jerry DiMaggio.PE			\$72.55	\$7,2		
ł	-		STR Eng Vill	60	\$76.13	\$4.50		
ŀ	16	David Gerber, PE	STR Eng VI	80	\$75.63	\$6.05		
ŀ	-17	Drew DelieDonne, RA	STR Eng VI	0	\$69.63	3		
ŀ	18		ORT STAFF			-		
ŀ	18	Support Staff	STRIV	609	\$48.04	\$28.83		
ŀ	20	Support Staff Support Staff	MECHEV	345	\$48.04	\$17.72		
ŀ		Support Staff Support Staff	ELEC I-V	385	\$45.04	\$17.72		
ļ	21	GANNE (T FLEMING	CAD/ ADMIN	1,440	\$37.23	\$51.61		
GANNE IT FLEMING OVERHEAD PATE 158.17% TECHNICAL STAFF								
ŀ	-			-				
ŀ	2	Richard Cross, PE David Howel, PE	OPM Cont Cont	20	\$105.40	\$2.10		
ŀ		David Howell, PE.	Rail Sys. Load	0	\$54.70	1		
ŀ	3	Robert Mathews, PE	Quality Control	8	\$53.80			
ŀ	- 5		Civil Lead	0	\$79.20	1		
ł	-	Sleven Zapotszny, PE Agnieszkia Lapinski, PE	SterCivi	0	\$43.70	1		
ŀ	6		Sr. Structural	(00	\$72.00	\$7,20		
ŀ	1	John Legath, PE	Track	G	\$64.10			
ŀ	8	Terry Shantz, PE	Call Trans	0	\$99.20			
ŀ	9	Bryan Shober, PE	CaV Trans	Ó	\$84.30			
ŀ	10	Grag Nazarow	Rail Ops	0	\$79.20	3		
ŀ	11	Lan Martin	Rail Ops	0	\$76.60			
Ļ	12	Nel Water	Comms	0	\$73.70			
Ļ	13	James Sgro	Commis	- 0	\$90.00			
Ļ	14	Theodore Bandy, PE	Sya. Integ.	0	\$100.00	5		
Ļ	15	Shohen Barkovich	Sys. Integ.	0	\$59.10	3		
ļ	16	Richard Lentz	Signals	0	\$81.90	5		
ŀ	17	Joseph Bonaduce	Signate	0	\$100.70	3		
Ĺ	- 16	Alireza Edraki, PE. PMP	Safety & Sec.	100	\$99.60	\$9,05		
Ĺ	18	McEwan van der Mandele, CPP	Safety & Sec.	120	\$77.70	\$9.32		
ĺ	19	Remesh Rajagopal PE	Hydraulics & Hydrology	0	\$73.30	1		
C			ORT STAFF		2000.00			
Ĺ	20	Technical Support Staff	Eng Staff	1.003	\$50.37	\$50.52		
Ĺ	-21	Administrative Support Staff HALET & ALURICH	CAD/ ADMIN	223	\$43.14	\$9.62		
				ERHEAD RATE	220,84%	4		
			ICAL STAFF	12200				
		Ed Zaminskie, PE	Lead Geolechnical Eng.	0	\$84,08	3		
	1		Project Engineer	0	\$60.60	5		
	2	Project Engineer						
	3	Engineering Staff	Eng Staff	0	\$50.69			
	_	Engineering Staff Junior Engineering Staff	Eng Staff Jr Eng Staff	0	\$50.69 \$34.99			
	3	Engineering Staff Juntor Engineering Staff SUPP	Eng Staff Jr Eng Staff ORT STAFF	0	\$34.99	5		
	3	Engineering Staff Junity Engineering Staff SUPP (CADD/ Project Assistant	Eng Staff Jr Eng Staff ORT STAFF CADV ADMIN	6	\$34.99	5		
	3	Engineering Staff Junity Engineering Staff SUPP ICADIV Project Assistant GREPTIN ENGINEERING	Eng Staff Jr Eng Staff ORT STAFF CAD/ ADMIN	0	\$34.99	3		
	3	Engineering Staff Junior Engineering Staff SUPP ICADIC/ Project Assistant GRIFFIN ENGINEERING TECHN	Eng Staff Jr Eng Staff ORT STAFF CADV ADMIN	6	\$34.99	5		

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED	HOURLY RATE	TOTAL SALARY		
		NAIK CONSULTING GR	009 01	ERHEAD RATE	127.09%			
			CHINICAL STAFF					
	1	John Tan, PE	PM	0	\$90.56	\$0		
	2	Rich Baron	SURV PM	0	\$58,30	50		
		Project Surveyor	SURV Proj. Surv.	Ő	\$47.50	50		
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0		
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	50 50 50 50 50 50		
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0		
	7	Senior Utility Engineer	UTIL Sen. Eng.	0	\$45.79	\$0		
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37 79	\$0		
		Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0 \$0 \$0 \$0 \$0		
	10	Structural Engineering Staff	STR Eng Staff	Ó	\$29.22	\$0		
×			IPPORT STAFF					
NAIK		CAD Manager	CAD Mgr	Ū Ū	\$58.19	\$0		
z	12	CAD Technicians	CAD Tech	0	\$30.54	\$0		
191	ENVISION OVERHEAD RATE 137.51%							
	-		CHINICAL STAFF					
		Kurt Buettler	Doc. Ctrl. Mgr	0	\$42.00	\$0		
z		Thomas Hartley	VE Team Lead	0	\$94.40	\$0 \$0		
⊈		Configuration Management	Config. Mgmt.	Ö	\$55.00	\$0		
ទ	4	Value Engineering Team	VE Team	0	\$75.52	\$0		
ENVISION			JPPORT STAFF					
Ш	5	Administration	Admin	0		\$0		
	-	JCMS		ERHEADTRATE	117.32%			
	-		CHINICAL STAFF					
2		K. Meehan	Senior Est.	0	\$63.67	\$0		
JCMS	2	Junior Estimator	Junion Est.	0	\$46.20	\$0		
5	3	Project Controls	94	0	\$57 75	\$0		
	-	RADIN		ERHEAD RATE	155,17%			
			CHNICAL STAFF					
١£ I	1	Chitra Raden	Disc. Lead	0	\$100.00	\$0		
RADIN			IPPORT STAFF					
E.	2	Beth Uczynski	CADIN	100	\$38.21	\$3,821		
5		SJH		ERHEAD RATE	140.00%			
Č.			CHINICAL STÄFF					
	1	S. Jayekumaren	Civil Eng VIII	0	\$84.24	\$0		
H	2	Senior Engineering Staff	Sen. Eng Staff	40	\$59.58	\$2,383		
တ်	3	Engineering Staff	Eng Staff	48	\$40.43	\$1,941		

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	5,745		_
Total Salary			\$313,024
Overhead			\$493,433
Subtotal			\$806,451
Fixed Fee		10%	\$80,648
Total Direct Costs			\$162
TOTAL COST		-	\$887,255

4.12C Track Design HAH / GANNETT FLEMING JV NO. PERSON NAME PROJECT TITLE / DISCIPLINE ESTIMATED HOURLY RATE INDURS TOTAL SALAR HARDDEST Y & HARDOVER OVERHEAD RATE 157.49% TOTAL SALAR 1 Waha Szumanzki, PE PM, STR Eng VII 0 969.66 3 2 Charke Greer, PE PM, Manager 0 539.61 3 3 David Tuckman, PE DÖKL STR Eng VII 0 580.61 3 4 Streve Haracker, PE, SE GADC, STR Eng VII 0 380.33 3 6 Peter Roody, PE STR Eng VIII 0 380.61 3 7 Michael Hawkins, PE STR Eng VIII 0 380.63 3 9 Alex Noble, PE ELEC Eng VI 0 370.25 3 10 Paul Connoby, PE STR Eng VIII 0 380.53 3 11 Gine Schetteikch, PE STR Eng VII 0 370.25 3 12 Raymond Manibadi, PE STR Eng VII		-	E	STIMATE BY INDIVIDUA						
NO. PERSON NAME PROJECT TITLE / DISCIPLINE ESTIMATED TOTAL SALAR TOTAL SALAR HARDDESTY & TARNOVER OVERHEAD RATE 197.49% TOTAL SALAR 1 Unable Sturmarski, PE PM, STR Eng VII 0 196.86 1 2 Charle Geer, PE PM, Manager 0 560.61 1 3 David Tuchman, PE OPA, STR Eng VII 0 550.36 1 4 Strow Hancker, PE, SE ODC, STR Eng VII 0 550.36 1 5 Strow Hancker, PE, SE STR Eng VII 0 580.61 1 6 Preter Roody, PE STR Eng VII 0 580.61 1 7 Michael Heakins, PE STR Eng VII 0 380.64 1 8 Steve Maucki, PE STR Eng VII 0 380.64 1 10 Preter Roody, PE STR Eng VII 0 380.64 1 11 Gen Societaica, PE, PD, STR Eng VII 0 380.67 1 11 Gen Societaica, PE, PD, ST	1	TASK:			FIRM:					
NO. PERSON NAME PROJECT ITE / DISCRUME HOURLY RATE IDTAL SALAR HARDESTY & TRANOVEN TECHNICAL STAFF OVERNIEAD RATE 197,49% 1 Viaba Szumanski, PE Pitsk Manager 0 596,86 2 Over Tucinian, PE Disk Manager 0 596,86 3 Over Tucinian, PE Disk Manager 0 596,86 4 Strive Hattacker, PE, SE OXOC, STR Eng VII 0 586,03 5 Strive Hattacker, PE, SE Dix Control 0 366,61 1 7 Michael Hawkins, PE STR Eng VII 0 380,61 3 6 Preter Roody, PE STR Eng VII 0 380,06 3 10 Pad Connoty, PE STR Eng VII 0 380,06 3 11 Gen State Roody, PE STR Eng VII 0 370,25 3 13 Maked March, PE STR Eng VII 0 370,37 3 14 David Manhoad, PE STR Eng VII 0 377,55	1	4.120	Track Design		H&H / GANN	ETT FLEMING	VL			
TECHNICAL \$77.#F 1 Vishis Szumanski, PE Pisk Manoper 0 596.86 \$ 2 Charles Geer, PE Pisk Manoper 0 598.81 \$ 3 David Tuchnan, PE DÖKK, STR Eng VII 0 \$81.61 \$ 4 Strive Harlacker, PE STR Eng VII 0 \$80.51 \$ 5 Strive Harlacker, PE STR Eng VII 0 \$80.51 \$ 6 Petre Roody, PE STR Eng VII 0 \$80.64 \$ 7 Michael Hawkins, PE STR Eng VII 0 \$80.64 \$ 9 Alast Nobba, PE ELEC Eng VII 0 \$80.67 \$ 10 Paul Connoby, PE STR Eng VIII 0 \$80.67 \$ 112 Reymond Manbadel, PE STR Eng VIII 0 \$876.53 \$ 13 Mahae' Yegan, PE, PPO STR Eng VII 0 \$76.53 \$ 14 David Marchae' RE STR Eng VII 0 \$76.53 <td< th=""><th></th><th>NO,</th><th></th><th></th><th>HOURS</th><th></th><th>TOTAL SALAR</th></td<>		NO,			HOURS		TOTAL SALAR			
1 Visbs Szumacht, PE PM, STR Eng VII 0 968 601 2 Charke Grer, PE Bitk Manager 0 \$58 01 3 David Tuckman, PE Dörk, STR Eng VII 0 \$572.32 4 Steve Hom, PE STR Eng VII 0 \$560.36 5 Steve Hom, PE STR Eng VII 0 \$660.36 6 Peter Roody, PE STR Eng VII 0 \$660.36 7 Michael Hawkins, PE STR Eng VII 0 \$660.36 9 Atex Noble, PE ELEC Eng VI 0 \$860.31 10 Pauk Cohnody, PE STR Eng VII 0 \$860.31 11 Gene Scheteich, PE STR Eng VII 0 \$800.51 12 Raymond Mankbadi, PE STR Eng VII 0 \$870.32 13 Maskac Yegau, PE, PhD STR Eng VII 0 \$870.33 14 David Marcic, PE, SE STR Eng VII 0 \$870.33 15 Jerry DMaggiop/Staff Sti/PC/VI 0 \$460.43<	-2	-			ERHEADRATE	167,40%				
2 Chaffe Gree, P.E. Bisk Manager 0 980.01 5 3 DavK Tuckman, P.E. DPMK, STR Eng VI 0 972.32 5 Steve Harn RC DEVK FR Eng VI 0 972.32 5 Steve Harn RC EXPREMENT, P.E. STR Eng VII 0 580.39 6 Peter Roody, P.E. STR Eng VII 0 580.51 2 7 Michael Hawkins, P.E. STR Eng VII 0 580.64 3 9 Atex Nobbe, P.E. ELEC Eng VI 0 370.28 3 10 Paul Connoby, P.E. STR Eng VII 0 380.06 3 11 Gen Scheteich, P.E. STR Eng VII 0 370.37 3 12 Raymond Manbade, P.E. STR Eng VII 0 377.35 3 15 Jerry DMAgolo P.E. STR Eng VII 0 376.53 3 16 Davk Marck, P.E. STR Eng VII 0 376.53 3 17 Drew Davedeborne, RA STR	11									
3 David Tuchman, PE DPM, STR Eng VII 0 \$81.81 4 Steve Hom, PE STR Eng VII 0 \$872.32 5 Steve Hom, PE STR Eng VII 0 \$860.36 6 Peter Roody, PE STR Eng VII 0 \$860.36 7 Michael Hawkins, PE STR Eng VIII 0 \$860.43 9 Ales Noble, PE ELEC Eng VII 0 \$860.43 9 Ales Noble, PE ELEC Eng VII 0 \$800.61.31 10 Paul Connoly, PE STR Eng VIII 0 \$800.63.13 11 Glen Scheteikch, PE STR Eng VIII 0 \$8100.76 11 Raymond Manibadi, PE STR Eng VIII 0 \$870.53 13 Mishare Yegan, PE Pob STR Eng VIII 0 \$875.35 14 David Marcis, PE (SE STR Eng VIII 0 \$875.63 13 Mishare Yegan, PE (STR Eng VIII 0 \$876.64 \$875.53 14 Support Staff STR Eng VIII 0	11						\$			
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16 McEwan van der Mandele, CPP Safetry & Sec. 0 \$77.70 1 19 Ramesh Rajagopal, PE Hydraules & Hydrology 0 \$77.30 3 19 Ramesh Rajagopal, PE Hydraules & Hydrology 0 \$77.30 3 20 Technical Support Staff Eng, Staff 0 \$50.37 3 21 Administrative Support Staff CAD/ ADMiN 0 \$55.37 3 71 Ed Jaministrative Support Staff CAD/ ADMiN 0 \$55.37 3 71 Administrative Support Staff CAD/ ADMiN 0 \$55.37 3 71 Ed Zaministrative Support Staff CAD/ ADMiN 0 \$54.314 3 71 Ed Zaminstrative Staff Lead Geolechnical Eng. 0 \$54.06 3 72 Project Engineer Project Engineer 0 \$50.66 3 73 Engineering Staff Eng Staff 0 \$53.59 3 74 Jumor Engineering Staff Lir Eng Staff 0	51									
18 McEwan van der Mandele, CPP Safety & Sec. 0 \$77.70 1 19 Ramesh Rejegopat, PE Hydraulas & Hydrology 0 \$77.30 3 19 Ramesh Rejegopat, PE Hydraulas & Hydrology 0 \$77.30 3 20 Technical Support Staff Eng, Staff 0 \$50.37 2 21 Administrative Support Staff CAD/ ADMiN 0 \$55.37 3 9 TECHNICAL STAFF OVERHEAD RATE 220,94% TECHNICAL STAFF 1 Ed Zaminstaive, PE Lead Geolechnical Eng. 0 \$\$43.14 3 2 Project Engineer Project Engineer 0 \$\$40.60 3 2 Project Ingineer Project Engineer 0 \$\$40.60 3 3 Engineering Staff Eng Staff 0 \$\$35.69 3 4 Junior Engineering Staff Liv Eng Staff 0 \$\$35.39 3 5 CADD Project Assistant ICAD ADMIN 0 \$\$30.30 \$\$	- 1	18								
19 Ramesh Rajagopst, PE Hydroxides & Hydrokogy 0 \$73.30 3 SUPPORT STAFF 20 Technical Support Staff Eng. Staff 0 \$50.37 3 21 Administrative Support Staff CAD/ ADMIN 0 \$43.14 3 TECHNICAL STAFF 1 Ed Zaministrative Support Staff CAD/ ADMIN 0 \$43.14 3 TECHNICAL STAFF 1 Ed Zaministrative Regimeer 0 \$\$60.60 3 2 Project Engineer Project Engineer 0 \$\$60.60 3 3 Engineering Staff Lix Eng Staff 0 \$\$30.69 3 4 Jamor Engineering Staff Lix Eng Staff 0 \$30.69 3 5 ECADDP Project Assistant (CAD/ ADMIN) 0 \$30.30 \$ 5 GADIP FIN ENGINEERING OWERHEAD RATE \$\$2,05% \$		18	McEwan van der Mandele, CPP	Safety & Sec.		\$77.70	1			
HALEY & ALDRICH OVERHEAD RATE 220,94% TECHNICAL STAFF TECHNICAL STAFF 1 E0 Zaminskie, PE Laad Geolechnical Eng. 0 \$84.06 3 2 Project Engineer Project Engineer 0 \$80.60 3 3 Engineering Staff Eng Staff 0 \$50.69 3 4 Junior Engineering Staff Jkr Eng Staff 0 \$353.99 3 5 CADDr Project Assistant ICAD ADMIN 0 \$30.30 3 GRIP FIN ENGINEERING OVERHEAD RATE \$82,39% 0 \$30.30 3	- 1	19			0	\$73.30				
HALEY & ALDRICH OVERHEAD RATE 220,94% TECHNICAL STAFF TECHNICAL STAFF 1 E0 Zaminskie, PE Laad Geolechnical Eng. 0 \$84.06 3 2 Project Engineer Project Engineer 0 \$80.60 3 3 Engineering Staff Eng Staff 0 \$50.69 3 4 Junior Engineering Staff Jkr Eng Staff 0 \$353.99 3 5 CADDr Project Assistant ICAD ADMIN 0 \$30.30 3 GRIP FIN ENGINEERING OVERHEAD RATE \$82,39% 0 \$30.30 3	E (-	SUPP							
HALEY & ALDRICH OVERHEAD RATE 220,94% TECHNICAL STAFF TECHNICAL STAFF 1 E0 Zaminskie, PE Laad Geolechnical Eng. 0 \$84.06 3 2 Project Engineer Project Engineer 0 \$80.60 3 3 Engineering Staff Eng Staff 0 \$50.69 3 4 Junior Engineering Staff Jkr Eng Staff 0 \$353.99 3 5 CADDr Project Assistant ICAD ADMIN 0 \$30.30 3 GRIP FIN ENGINEERING OVERHEAD RATE \$82,39% 0 \$30.30 3	1	20	Technical Support Staff	Eng. Staff	0	\$50 37	5			
TECHNICAL STAFF 1 Ed Zaminskie, PE Laad Geolechnical Eng. 0 \$84.06) 1 2 Project Engineer Project Engineer 0 \$80.60) 1 3 Engineering Staff Eng Staff 0 \$50.69) 1 4 Junior Engineering Staff Jr. Eng Staff 0 \$34.99) 1 5 CADDr Project Assistant GRIPFIN ENGINEERING 0 \$30.30) 3	51		Administrative Support Staff							
TECHNICAL STAFF 1 Ed Zaminskie, PE Laad Geolechnical Eng. 0 \$84.06) 9 2 Project Engineer Project Engineer 0 \$80.60) 9 3 Engineering Staff Eng Staff 0 \$50.69) 9 4 Junior Engineering Staff Jr. Eng Staff 0 \$34.99) 9 5 CADD/ Project Assistant (CAD/ ADMIN) 0 \$30.30) 3 GRIFFIN ENGINEERING OVERHEAD RATE 182.30% 182.30%	ť	-	HALLET & ALURICH							
1 Ed Zamnskie, PE (Lad Geolechnical Eng. 0 \$84.08 3 2 Project Engineer 0 \$60.60 3 3 Engineering Staff Eng Staff 0 \$50.69 3 4 Junior Engineering Staff Jr. Eng Staff 0 \$34.99 3 5 ECADDP Project Assistant (CADA ADMIN) 0 \$30.30 \$ 5 ICADDP Project Assistant 0 \$30.30 \$ GRIFFIN ENGINEERING OVERHEAD RATE \$\$2,39%				ICAL STAFF						
2 Project Engineer Project Engineer 0 \$80.60 \$ 3 Engineering Staff Eng Staff 0 \$50.69 \$ 4 Junior Engineering Staff Jule Eng Staff 0 \$\$34.99 \$ 5 CADD/ Project Assistant (CAD/ ADMIN 0 \$30.30 \$ GRIPPEN ENGINEERING OVERHEAD RATE 1\$2,30% \$ \$		1			0	\$34.04				
3 Engineering Staff Eng Staff 0 \$50.69 3 4 Junior Engineering Staff Jr. Eng Staff 0 \$34.99 3 5 [CADD/ Project Assistant GRIPFIN ENGINEERING (CAD ADMIN) 0 \$30.30 3		2								
4 Junior Engineering Staff (Jr. Eng Staff 0) \$34.99 3 SUPPORT STAFF 5 [CADDr Project Assistant (CADA ADMIN 0) \$30.30] 5 GRIPFIN ENGINEERING OVERHEAD RATE 182.30%	ł									
SUPPORT STAFF 5 [CADD/ Project Assistant (CAD/ ADMIN 0] \$30.30] GRIPFIN ENGINEERIING OVERHEAD RATE 182,30%										
GRIFFIN ENGINEERING OVERHEAD RATE 182.30%	5				· · · · ·					
GRIFFIN ENGINEERING OVERHEAD RATE 182.30%	E F	5			0	\$30.30				
	Η	-	GROFFIN ENGINEERONG							
		-								
					-					

	NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY			
	-	NAIK CONSULTING GR	900 900	RHEAD RATE	127.09%				
E		TE	CHNICAL STAFF						
	1	John Tan, PE	PM	0	\$90.56	\$0			
	2	Rich Baron	SURV PM	0	\$58.30	\$0			
21	3	Project Surveyor	SURV Pro Surv.	0	\$47.50	\$0			
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0 \$0			
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0			
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0			
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45.79	\$0			
	8	Utility Engineering Staff	UTIL Eng Staff	0		\$0			
	9	Senior Structural Engineer	STR Sen. Eng	0	\$54.50	\$0			
	10	Structural Engineering Staff	STR Eng Staff	Ó	\$29.22	\$0			
5		st	IPPORT STAFF						
NAIK	11	CAD Manager	CAD Mgr	Ó	\$58.19	\$0			
Z	12	CAD Technicians	CAD Tech	0	\$30,54	\$0			
		ENVISION	OV	READERATE	137.51%				
		TECHNICAL STAFF							
		Kurt Buetter	Doc. Ctrt. Mgr	0	\$42.00	\$0			
z		Thomas Hartley	VE Team Lead	0	\$94.40	\$0			
ō	- 3	Configuration Management	Config. Mgmt.	0	\$55.00	\$0			
<u>8</u>	-4	Value Engineering Team	VE Team	. 0	\$75.52	\$0			
ENVISION		SL	JPPORT STAFF						
a	5	Administration	Admin	0	\$21.40	\$0			
1111		JCMS	DV	CRITEAD RATE	117.32%				
		TE	CHNICAL STAFF						
50	1	K. Meehan	Senior Est.	0	\$63.67	\$0			
JCMS	2	Junior Estimator	Junion Est.	0	\$46.20	\$0			
41	3	Project Controls	PC	0	\$57 75	\$0			
0.0		RADIN	OV	RHEAD RATE	155.17%				
1.1		TE	CHNICAL STAFF						
21	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0			
RADIN		SL	JPPORT STAFF						
2	2	Beth Uczynski	ICAD IV	0	\$38.21	\$0			
100	-	SJH	- OV	RINEADRATE	140.00%				
		TE	CHINICAL STAFF						
	1	S. Jayakumaran	Civil Eng VIII	0	\$84,24	\$0			
Hrs	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	50			
2		Engineering Staff	Eng. Staff	Ő					

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	395	-	
Total Salary			\$25,470
Overhead			\$42,132
Subiotal			\$68,601
Fixed Fee		10%	\$8,860
Total Direct Costs			\$6,860 \$162
TOTAL COST			\$75,623

TA	SK:		STIMATE BY INDIVIDUA	FIRM:		
		Civil Destan				
-	120	Civil Design			ETT FLEMING	JV
N	10.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR
		HARDESTY & HANOVER		CRIMINAL RATE	157,40%	
1			HCAL STAFF			
	1 2	Visha Szumanski, PE Charte Geer, PE	PM, STR Eng VIII	0	\$96.86	5
	-	David Tuckman, PE	Risk Manager	0	\$96.01	1
	3	David Tuckman, PE Steve Harlacker, PE, SE	DPM, STR Eng VI	0	\$81 81	
	5	Steve Hom, PE. SE	QAQC. STR Eng VI	0	\$72.32	
	6		STR Eng VII	0	\$80.39	1
		Peter Roody, PE Micheel Hawkins, PE	STR Eng VIII	0	\$86.51	
	8	Strve Milucki, PE	STR Eng VIII	0	\$106.14	1
	9	Alex Noble, PE	MECH Eng VII ELEC Eng VI	0	\$86.43	3
	10	Paul Connolly, PE	STR Eng VI	0	\$70.29	
	11	Glen Schetelich, PE	STR Eng VIII	D	\$109.75	
	12	Raymond Mankbadi, PE	STR Eng VIII	0		
	13	Mishac Yegian, PE, PhD	STR Eng VIII	0	\$86.58 \$78.13	-
	14	David Marpe, PE, SE	STREngVI	0	\$72.55	-
	15	Jerry DiMaggio.PE	STR Eng VIII	0	\$78.13	
	16	David Gerber, PE	STR Eng VI	0	\$75.63	3
	17	Drew DelieDonne, RA	STR Eng VI	0	3/3.03	
	-		ORT STAFF	-	400.04	
	18 1	Support Staff	STRIV	0	-546 011	
	19	Support Staff	MECH I-V	0	\$46.04	
	20	Support Staff	ELEC I-V	0	\$46.04	
1	21 .	Support Staff	CADY ADALIN	0	\$37,23	-
1.00	-	GANNETTFLEMING	09	FHEAD RATE	158.17%	
	-	TECH	HCAL STAFF			
	1	Hichard Cross, PE	OPM .	0	\$105.40	8
	2	David Howelt, PE	Rail Bys. Lead	D	\$64.70	1
		Bruce Smith	Rail Sys. Lead Quality Control	0	\$83.85	1
	4	Robert Matthews, PE	Civil Lead	136	\$79.20	\$10.77
	5	Steven Zapoticzny, PE	SRECIM	424	\$43 70	\$18.52
	6	Agniesztika Lapinski, PE John Legath, PE Terry Shantz, PE	Sr. Structural	ő	\$72.00	
	7	John Legath, PE	Track	C	\$54.10	1
	8	Terry Shantz, PE	Call/ Trans	0	\$99.20	
-		Bryan Shober, PE	Cal/ Trans	0	\$84.30	
		Greg Nazarow	Rail Ops	0	\$79.20	5
		lan Martin	Reil Ops	0	\$78 60	
		Net Water	Comms	0	\$73.70	3
		James Sgra	Comma	0	\$90.00	5
	14	Theodore Bandy, PE	Sys. Integ.	0	\$100.00	5
		Slephen Barkovich	Sys. Integ	0	\$59.10	\$
		Richard Lentz	Signals	0	\$81.90	3
		Joseph Bonaduce	Signals	0	\$100 70	5
		Alwaza Edraki, PE, PMP	Salely & Sec.	0	\$99.60	\$
		McEwan van der Mandele, CPP	Safety & Sec.	0	\$77.70	5
-	19	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30	
			DRT STAFF			
	20	Technical Support Staff	Eng Staff	638	\$50.37	\$30.62
2	21	Administrative Support Staff HALLEY & ALDHUCH	CADY ADMIN	212	\$43.14	\$10,00
-				RHEAD RATE	220.04%	
	-	TECHN	ICAL STAFF			-
		Ed Zaminskie, PE	Lead Geolechnical Eng.	20	364.06	\$1,65
		Project Engineer	Project Engineer	40	\$60.60	\$2.42
		Engineering Staff	Eng Staff	80	\$50.69	\$4,05
F,	4	Junior Erigineering Staff	Jr Eng Sunt	40	\$34.99	\$1,40
			ORT STAFF			
	ą.	CADOV Project Assistant	CAD/ ADMIN	RHEAD RATE	\$30.30	\$30
1						
			CAL STAFF	ANCAD MAIS	194.3976	-

_	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY	
10	1.000	NAIK CONSULTING GR	00P 0V	ERHEAD RATE	127.09%		
91	-		CHNICAL STAFF				
	1	John Tan, PE	PM	0	\$90.56	\$0	
	2	Rich Baron	SURV PM	0	\$58,30	\$0	
1		Project Surveyor	SURV Proj. Surv	0	\$47.50	50	
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0	
	5	Instrument Technician	SURV Insl. Tech	0	\$28.62	\$(\$(\$(\$(\$(
	6	Ron Rotunno, PE	UTIL Mgr	Ö	\$74.66	50	
	7	Senior Ullity Engineer	UTIL Sen. Eng.	Ő	\$45,79	50	
		Utility Engineering Staff	UTIL Eng Staff	0	\$37 79	\$0 \$0	
		Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0	
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0	
2			PPORT STAFF				
NAIK		CAD Manager	CAD Mgr	0	\$58.19	\$0	
Z	12	CAD Technicians	CAD Tech	Ö	\$30.54	\$0	
111	_	ENVISION	OV	ERHEAD RATE	137,51%		
	TECHNICAL STAFF						
100		Kurt Buettler	Doc. Cirl. Mgr	0	\$42.00	ŚC	
z		Thomas Hartley	VE Team Lead	Ū.	\$94.40	\$0	
2		Configuration Management	Config. Mgmt.	0	\$55.00	\$0	
12	4	Value Engineering Team	VE Team	Ō	\$75.52		
ENVISION			IPPORT STAFF				
Ű		Administration	Admin	0	\$21.40	\$0	
		JCMS		ERREAD RATE	117.32%		
	_		CHNICAL STAFF				
JCMS		K. Meehan	Senior Est.	0	\$63.67	\$0	
5		Junior Estimator	Junion Est.	0	\$46.20	50	
5	3	Project Controls	IPC	0	\$57.75	\$0	
-	-	RADIN		SHE DRAIE	155.17%		
-	_		HNICAL STAFF				
둜	1	Chira Radin	Disc. Lead	0	\$100.00	\$ 0	
RADIN			PPORT STAFF				
E		Beth Uczynski	CADIV	0	\$38.21	\$0	
	_	SJH		ERHEAD RATE	140.00%		
			HNICAL STAFF				
_	_	S. Jayakumaran	Civil Eng VIII	0	\$84.24	\$0	
FS	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0 \$0	
63	3	Engineering Staff	Eng Staff	0	\$40.43	\$0	

TEAM SUMA	TARY		
TOTAL ESTIMATED HOURS	1,590	*	-
Total Salary			\$79,790
Overhead			\$133,104
Subtotal			\$212,901
Fixed Fee		10%	\$21,280
Total Direct Costs			\$162
TOTAL COST			\$234,353

1		Ē	STIMATE BY INDIVIDUA	LTASK		
	TASK:			FIRM:		
	4.12E	Buildings & Facilities		H&H / GANN	ETT FLEMING	.W
	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED		TOTAL SALARY
-	-	HARDESTY & HANOVER	ONE	RHEADRATE	157,40%	
	_		ICAL STAFF			
1	1	Visha Szumanski, PE	PM, STR Eng VIII	0	\$96.86	\$0
	2	Charlie Geer, PE	Risk Manager			
	3	David Tuckman, PE	DPM, STR Eng VII			30
	Å	Steve Harlacker, PE, SE	QAOC, STR Eng VI			<u>بد</u> لا
12	5	Steve Horn, PE	STR Eng Vil			
	6	Peter Roody, PE	STR Eng VIII	20	410.000	\$1,73
	7	Michael Hawkins, PE	STR Eng Vill	20		
	8	Steve Mikucki, PE	MECH Eng VII			\$I
	9	Alex Noble, PE	ELEC Eng VI	0		<u> </u>
	10	Paul Connolly, PE	STR Eng VII			
	11	Glen Schelelich, PE	STR Eng VIII			
r i	12	Raymond Mankbadi, PE	STR Eng VIII			\$0
51	13	Mishac Yegian, PE, PhD	STR Eng Vill			
δ	14	Oavid Marcic, PE, SE	STR Eng VI	ŏ		Î
31	15	Jerry DiMaggio, PE	STR Eng VII	0		
& HANOVER	16	David Gerber, PE	STR Eng VI	Ő		50
	17	Drew DeleDonne, RA	STR Eng VI	60		\$4,190
≻I			ORT STAFF			34,150
5	18	Support Staff	STRI-V	72	\$46.04	\$3,315
HARDESTY	19	Support Staff	MECHI-V	/4		33,310
뉟	20	Support Staff	ELEC I-V	0		34
<u>s</u>	20	Support Staff	CADY ADMIN	44		\$1.638
-	21	GANNETT FLEMING		ERIHEAD RATE		\$1,038
	_			INNEAD RATE	100,1/76	
	_		ICAL STAFF			
		Richard Cross, PE	OPM	0		\$0 \$0
	2	David Howell, PE	Rail Sys. Lead	0		
	3	Bruce Smith	Quality Control	0		50
	4	Robert Matthews, PE	Civil Lead	0		\$0
	5	Steven Zapoliczny, PE	Ste/Civit	0		\$2
	6	Agnieszkka Lapinski, PE	Sr. Structural	0	\$72.00	\$0
	7	John Legath, PE	Track	0	\$64.10	\$0
	8	Teny Shantz, PE	Cal/ Trans	0	\$99.20	50
	9	Bryan Shober, PE	Cat/ Trans	0	\$84.30	\$0
	10	Greg Nazarow	Rail Ops	0	\$79.20	\$0
	11	ten Martin	Rail Ops	0		
	12	Neil Waker	Comms			\$(\$(
	13	James Soro	Comma	0		
	14	Theodore Bandy, PE	Sys. Integ.	0		
σ	15	Slephen Barkovich	Sys. Integ.	0		<u> </u>
	16	Richard Lentz	Signals	0		<u>- + -</u> \$0
5	17	Joseph Bonaduce	Signals	0		\$0
2	18	Aireza Edraki, PE, PMP	Safety & Sec.	0		<u> </u>
	18			0		
EI	19	Ramesh Rajagopal, PE	Safely & Sec. Hydraulics & Hydrology			\$0 \$0
GANNETT	13		DRT STAFF	<u> </u>	\$73.30	۶L
z I	20	Technical Support Staff	Eng. Staff		A	
S	20			0		
-	21		CAD/ ADMIN	0		\$0
	_	HALEY & ALUKICH		RHEADRATE	220.84%	104
			ICAL STAFF			
	1	Ed Zaminslue, PE	Lead Geotechnical Eng.	0		
	2	Project Engineer	Project Engineer	0		\$0
	3	Engineering Staff	Eng Staff	0		\$0
	4		Jr. Eng Staff	Ū	\$34.99	\$0
2			ORT STAFF			
÷.	5		CADY ADMIN	0		° \$0
		GRIFFIN ENGINEERING		REPART	152,36%	the second se
H		TECHN	ICAL STAFF			
U U	1	Joe Griffin, PE	Const. Rev.	0	\$90.00	\$0

		PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY		
		NAIK CONSULTING GR	907 900	ERHEAD RATE	127.09%			
			CHNICAL STAFF					
		John Tan, PE	PM	0	\$90.56	\$0		
		Rich Baron	SURV PM	0	\$58.30	\$0 \$0		
		Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0		
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0		
		Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0		
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0 \$0		
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45,79	\$Ó		
	8	Utility Engineering Staff	UTIL Eng Staff	0		\$0		
	9	Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0		
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0		
l 🗸 E	-		IPPORT STAFF					
	11	CAD Manager	CAD Mgr	0	\$58.19	\$0		
2 C	12	CAD Technicians	CAD Tech	0	\$30.54	\$0 \$0		
	ENVISION OVERHEAD RATE 137.51%							
			CHNICAL STAFF					
		Kurt Buettler	Doc. Ctrl. Mgr	0	\$42.00	\$0		
zΓ	2	Thomas Hartley	VE Team Lead	0	\$94.40	\$0		
2 E	3	Configuration Management	Config. Mgmt.	Ó	\$55.00	\$0		
1 🖾 🗆	4	Value Engineering Team	VE Team	0	\$75.52	\$0		
ENVISION	-	50	PPORT STAFF					
	5	Administration	Admin	0	\$21.40	\$0		
		JCMS	NO.	RHEADTRAIE	117.32%	G		
		TEC	CHNICAL STAFF	100				
S I	1	K. Meehan	Senior Est.	0	\$63.67	\$0		
PCMS	2	Junior Estimator	Junion Est.	0	\$46,20	\$0		
×Γ	3	Project Controls	PC	0	\$57.75	\$0		
		RADIN	OV	RHEADRATE	155.17%			
			HNICAL STAFF					
i≩ E	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0		
RADIN	_	SU	PPORT STAFF					
21	2	Beth Uczynski	ICAD IV	0	\$38,21	\$0		
	-	รมห 🦢 👘	.00	RHEADRATE				
		TEC	HNICAL STAFF					
	1	S. Jayakumaran	Civil Eng VIII	0	\$84,24	\$0		
I	2	Senior Engineering Staff	Sen, Eng Staff	0	\$59.58	\$0		
3F	3	Engineering Staff	Eng. Staff	0	\$40.43	\$0		

TEAM SUMM	1RY		
TOTAL ESTIMATED HOURS	196	-	
Total Salary	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		\$10,873
Overhead			\$17,114
Subtotal			\$27,987
Fixed Fee		10%	
Total Direct Costs	-		\$2,799
TOTAL COST			\$30,948

	-	E	STIMATE BY INDIVIDUA	LITASK		
	TASK:			FIRM;		
	4.12F	TP / Electrical		HEH / CANN	ETT FLEMING	n/
	NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED		TOTAL SALARY
-	-	HARDESTY & HANOVER	04	HOURS		
			HCAL STAFF	ERNEAD RATE	15/,49%	_
	1	Visha Szumanski, PE				
	2	Charle Geer, PE	PM, STR Eng VIII Risk Manager	0	\$96.86	्रध
	3	David Tuckman, PE	DPM, STR Eng VII	0	\$98.01	_\$
	1	Steve Harlacker, PE, SE	QAQC, STR Eng VI		\$72.32	
	5	Sleve Hom, PE	STR Eng Vil		\$80.39	
	1- ē-	Peter Roody, PE	STR Eng VIII	0	\$86.51	
	7	Michael Hawkins, PE	STR Eng VIII	- ö	\$105.14	
	L is	Sleve Mikucki, PE	MECH Eng VII			
	9	Alex Noble, PE	ELEC Eng VI	ő	\$70,29	
	10	Paul Connolly, PE	STR Eng VII	-ŏ	\$80.09	\$(\$(
	11	Gien Schetelich, PE	STR Eng Vill	ő	\$109.79	
۲Ľ	12	Raymond Mankbadi, PE	STR Eng Vill	0	\$86.58	
& HANOVER	13	Mishac Yegian, PE, PhD	STR Eng Vill	0	\$76.13	
õ	14	David Marcic, PE, SE	STR Eng VI		\$72.55	
Z	15	Jerry DiMaggio.PE	STR Eng VIII	ŏ	\$76.13	
3	10	David Gerber, PE	STR Eng VI	ő	\$75.63	
10	17	Drew DeleDonne, RA	STR Eng VI			
≥			ORT STAFF	, v	308.00	
5	18	Support Staff	ISTRI-V	0	\$46.04	\$0
HARDESTY	19	Support Staff	MECH I-V	0	\$46.04	
2	20	Support Staff	ELEC I-V	0	\$46.04	5
Ş	21	Support Staff	CADY ADMIN		\$37.23	
		GANNELT FLEMING		ERHEAD RATE	159.17%	
			ICAL STAFF		103,1776	-
		Richard Cross, PE	OPM			
	2	David Howelt, PE		20	\$105.40	\$2,100
	5	Bruce Smith	Rail Sys. Lead	200	\$64.70	\$12,940
	- Å	Robert Matthews, PE	Quality Control	0	\$63.80	\$0
	5	Steven Zapoticzny, PE	Site/Civil	0	\$79.20 \$43.70	
	6	Agnieszkka Lapinski, PE	Sterictural	0	\$43.70	
		John Legath, PE	Track	0		\$0 \$0
	⊢ í−	Terry Sharitz, PE	Cal/ Trans	24	\$64.10	\$2,381
	۲, T	Bryan Shober, PE	Cal/ Trans	140	\$89.20	
	10	Greg Nazarow	Rail Ops			\$11,802
	11	Ian Martin		16	\$79.20	\$1,267
	12	Neil Water	Rail Ops Comms	0	\$76.60	\$0
	13			0	\$73.70	\$0
- 1		James Sgro	Comms	0	\$90.00	\$(
0	14	Theodore Bandy, PE	Sys. Inleg.	32	\$100.00	\$3,200
ž	15	Stephen Barkovich	Sys. Inleg.	196	\$59.10	\$11,584
FLEMING	16	Richard Lentz	Signals	0	\$81.90	\$0
4	17	Joseph Bonaduce	Signals	D	\$100.70	50
	18	Aireza Edralu, PE, PMP	Safety & Sec.	0	\$99.60	\$(
	- 18	McEwan van der Mandele, CPP		0	\$77.70	\$(
GANNETT	19	Ramesh Rajagopat, PE	Hydraulics & Hydrology	0	\$73.30	\$č
Z			ORT STAFF			
5	20	Technical Support Staff	Eng Staff	722	\$50 37	\$36,367
-	<u></u> <u></u>	Administrative Support Staff	CAD/ ADMIN	655	\$43.14	\$28,257
		HALLET & ALDRICH		anna dhana	220.94%	-
	<u> </u>		HCAL STAFF			_
	1	Ed Zaminskie, PE	Lead Geotechnical Eng	0	\$84.06	\$(
	2	Project Engineer	Project Engineer	0	\$60.60	\$0
	3	Engineering Staff	Eng Staff	0	\$50.89	\$0
	- 4 - :	Junior Engineering Staff	Jr. Eng Staff	Ó	\$34.99	\$0
Į			ORT STAFF			
E I	5	CADD/ Project Assistant	CAO ADMIN	0		- \$0
17	_	GRIFFIN ENGINEERING		PRIEADIRATE	182,30%	
ł	_		ICAL STAFF			
	1	(Joe Griffin, PE	Const. Rev	0	\$90.00	\$0

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED	HOURLY RATE	TOTAL SALARY				
15	199	NAIK CONSULTING GR	007 00	ERHEAD RATE	127.09%					
		TE	CHNICAL STAFF							
	1	John Tan, PE	PM	0	\$90.56	\$0				
	2	Rich Baron	SURV PM	0	\$58.30	\$0				
	3	Project Surveyor	SURV Proj. Surv	0	\$47,50	\$0 \$0				
	4	Party Chief	SURV Inst. Tech.	0	\$37.21	\$0				
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0				
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0				
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45,79	\$0				
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0				
	9	Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	\$0				
	10	Structural Engineering Staff	STR Eng Staff	0	\$29,22	50				
		54	UPPORT STAFF			-				
NAIK	11	CAD Manager	ICAD Mor	0	\$58,19	\$0				
2	12	CAD Technicians	CAD Tech	0	\$30,54	\$0				
		ENVISION OVERHEAD RATE 137.51%								
		TE	CHINICAL STAFF							
		Kurt Buettler	Doc. Ctrl. Mgr	0	\$42.00	30				
z	2	Thomas Hartley	VE Team Lead	0	\$94.40	\$0				
Q	3	Configuration Management	Config. Mgmt.	Ó	\$55.00	\$0				
i Si	4	Value Engineering Team	VE Team	0	\$75.52	\$0				
ENVISION	-		SPPORT STAFF							
Ш	5	Administration	Admin	0	\$21.40	\$0				
100	-	JCMS	OV	RHEADRATE	117.32%					
	-		CHNICAL STAFF							
th I	1	K. Meehan	Senior Est.	Ó	\$63 67	\$0				
JCMS	2	Junior Estimator	Junion Est.	D	\$46.20	\$0				
191	3	Project Controls	PC	0	\$57.75	\$0				
	· CONTRACTOR	RADIN	ov	RHEAD RATE	156.17%					
	-	TE	CHNICAL STAFF							
2	1	Chtra Radin	Disc. Lead	0	\$100.00	\$0				
RADIN	-		JPPORT STAFF							
2	_2	Beth Uczynski	CADIN	181	\$38.21	\$6,916				
	642000	SJH		RHEAD RATE	140.00%					
			CHNICAL STAFF							
1	1	S. Jayakumaran	Civil Eng VIII	0	\$84.24	\$0				
HLS	_2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0				
တ်	3	Engineering Staff	Eng Staff	Ô	\$40.43	\$0				

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	2,166		
Total Selery			\$118,821
Overhead			\$185,668
Subtotal			\$302,490
Fixed Fee		10%	\$30,249
Total Direct Costs			\$162
TOTAL COST			\$332,900

TASK:		STIMATE BY INDIVIDUA	FIRM					
4.120	Signal Systems	H&H / GANNETT FLEMING JV						
NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAP			
-	HARDESTY & HANOVER		RHEADTRATE	187.40%				
-		ICAL STAFF						
1	Visha Szumanski, PE	PM, STR Eng VIII	0	\$96.86				
2	Charle Geer, PE	Risk Manager	0	\$96.01				
3	David Tuckman, PE Sleve Harlacker, PE, SE	OPM. STR Eng VII	0	\$81.81	1			
5	Sleve Hom, PE	QAQC, STR Eng VI	0	\$72.52	-			
_		STR Eng VII	0	\$60.39				
6	Peter Roody, PE	STR Eng VIII	0	\$86.51	1			
B	Michael Hawkins, PE Sleve Mikucki, PE	STR Eng VIII	0	\$105.14				
9	Alex Noble, PE	MECH Eng VI	0	\$86.43				
10	Paul Connolly, PE	ELEC Eng VI STR Eng VII	0	\$70.29 \$80.09				
11	Glen Schetelich, PE	STR Eng VIII	0	\$109,79	-			
12	Raymond Mankbadi, PE	STR Eng VIII	0	\$86,58				
13	Mishac Yegian, PE, PhD	STR Eng VIII	0	\$76.13				
14	David Marcic, PE, SE	STRENGVI	0	\$72.55	-			
15	Jeny DiMaggio PE	STR Eng VIII	0	\$76,13				
16	Clavid Gerber, PE	STR Eng VI	0	\$75.63				
17	Drew DeleDonne, RA	STR Eng VI	0	\$69.83				
1.00		ORT STAFF						
18	Support Staff	STRI-V	0	\$46.04	ľ.			
19	Support Staff	MECHI-V	0	\$46.04				
20	Support Staff	ELEC I.V	0	346.04				
21	Support Staff	CADY ADMIN	0	\$37.23				
GANNETT FLEMING OVERHEAD RATE 188,17%								
TECHNICAL STAFF								
1	Richard Cross, PE	OPM	15	\$105.40	\$1.6			
2	David Howell, PE Bruce Smith	Rad Sys. Load	20	\$64.70	\$1.2			
3		Quality Control	0	\$83.60				
4	Robert Matthews, PE	Civil Lead	Ó	\$79.20	1			
	Steven Zapoliczny, PE	Site/Civil	0	\$43.70	1.1			
- 5	and a stability of the state of the state							
8	Agnieszkka Lapinski, PE	Sr. Structural	0	\$72.00				
8	John Legath, PE	Track	ō	\$64.10				
8	John Legath, PE Terry Chaniz, PE	Track Call Trans	0	\$64.10 \$99.20				
8 7 8 9	John Legath. PE Terry Shaniz, PE Bryan Shober, PE	Track Call Trans Call Trans	0	\$64.10 \$39.20 \$64.30				
8 7 8 9 10	John Legath. PE Terry Chaniz, PE Bryan Shober, PE Greg Nazarow	Track Cel/ Trans Cel/ Trans Rel Ops	0	\$84.10 \$99.20 \$84.30 \$79.20				
8 7 8 9 10 11	John Legath. PE Terry Charliz, PE Bryen Shober, PE Greg Nazarow Ian Martin	Track Cell Trans Cell Trans Rel Ces Rel Ces	00000	\$64.10 \$99.20 \$84.30 \$79.20 \$76.60				
8 7 8 9 10 11 12	John Legath, PE Terry Chaniz, PE Bryen Shober, PE Greg Nazarow Jan Martin Neil Watter	Track Call Trans Call Trans Rail Ops Rail Ops Comms	0 0 0 0	\$64.10 \$199.20 \$84.30 \$79.20 \$76.60 \$73.70				
8 7 8 9 10 11 12 13	John Legath, PE Terry Ghaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Nel Water James Syro	Track CeV Trans CeV Trans Rel Ops Rel Ops Comms Comms Comms	0 0 0 0 0 0 0	\$64.10 \$99.20 \$84.30 \$79.20 \$78.60 \$75.70 \$90.00				
8 7 8 9 10 11 12 13 13	John Legath, PE Terry Ghaniz, PE Bryen Shober, PE Gorg Nazarow Ian Martin Net Water James Sgro Theodore Bandy, PE	Track Call Trans Call Trans Rel Ops Rel Ops Comms Comms Sys. Integ	0 0 0 0 0 0 0 0 0	\$64.10 \$99.20 \$54.30 \$79.20 \$76.60 \$73.70 \$90.00 \$100.00				
8 7 8 9 10 11 12 13 13 14 15	John Legath, PE Teny Ghaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neal Water James Spro Theodore Bandy, PE Stephen Barkovich	Track Call Trans Call Trans Call Trans Rel Ops Rel Ops Comms Comms Sys. Integ	0 0 0 0 0 0 0	\$84.10 309.20 \$84.30 \$79.20 \$78.60 \$73.70 \$90.00 \$100.00 \$59.10				
8 7 8 9 10 11 12 13 13	John Legath, PE Terry Ghaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neil Water James Sgro Theodore Bandy, PE Blaphen Bankovich Richard Leniz	Track Call Trans Call Trans Call Trans Rel Ops Rel Ops Comms Comms Sys. Integ Sys. Integ Sys. Integ Sys. Integ	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84.10 399.20 \$84.30 \$79.20 \$78.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90	\$11			
8 7 8 9 10 11 12 13 14 15 16	John Legath, PE Teny Ghaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neal Water James Spro Theodore Bandy, PE Stephen Barkovich	Track Call Trans Call Trans Call Trans Rel Ops Rel Ops Comms Comms Sys. Integ	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84.10 \$99.20 \$84.30 \$79.20 \$76.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90 \$100.70	\$11 \$3 02			
6 7 8 9 10 11 12 13 14 15 16 17	John Legath, PE Teny Ghaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neal Water James Sgro Theodore Bandy, PE Staphen Bankovich Richard Lentz Joseph Bonaduce Joseph Bonaduce Joseph Bonaduce	Track Call Trans Call Trans Call Trans Rel Ops Rel Ops Rel Ops Sys. Intég Sys. Intég Signals S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84.10 \$99.20 \$84.30 \$79.20 \$78.60 \$73.70 \$90.00 \$100.00 \$100.00 \$59.10 \$81.90 \$100.70 \$30.070	\$11 \$3 0			
6 7 8 9 10 11 12 13 13 14 15 16 17 18	John Legath, PE Terry Ghaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neel Water James Sgro Theodore Bandy, PE Biaphen Barkovich Richard Lentz Joseph Bonaduco Alweza Edraki, PE, PMP MicEven van der Mandele, CPP	Track Call Trans Call Trans Call Trans Rel Ops Rel Ops Comms Comms Comms Sys. Integ Sys. Integ Syn.als Signals Signals Signals Safety & Sec. Safety & Sec. Sec. Sec. Sec. Sec. Sec. Sec. Sec.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$79.20 \$78.60 \$75.70 \$90.00 \$100.00 \$59.10 \$89.90 \$100.00 \$319.00 \$100.00 \$100.70 \$89.90 \$100.70	\$11 \$3 00			
8 7 8 9 10 11 12 13 14 15 16 17 18	John Legath, PE Teny Chaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neal Water James Sgro Theodore Bandy, PE Biaphen Barkovich Richard Lentz Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Aweza Edraki, PE McEwan van der Mandele, CPP Mainesh Rajagopal, PE	Track Call Trans Call Trans Call Trans Rel Ops Rel Ops Rel Ops Sys. Intég Sys. Intég Signals S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$84.10 \$99.20 \$84.30 \$79.20 \$78.60 \$73.70 \$90.00 \$100.00 \$100.00 \$59.10 \$81.90 \$100.70 \$30.070	\$11 \$3 00			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 19	John Legath, PE Terry Ghaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neel Water James Sgro Theodore Bandy, PE Biaphen Barkovich Richard Lentz Joseph Bonaduco Aireza Edraki, PE, PMP McEven van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff	Track Call Trans Call Trans Call Trans Rel Ops Rel Ops Comms Comms Sys. triteg Sys. triteg Signats Sig	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$78.40 \$79.20 \$78.60 \$100.00 \$59.10 \$81.90 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60	311 \$300			
8 7 8 9 10 11 12 13 14 15 16 17 18	John Legath, PE Terry Ghaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neel Water James Sgro Theodore Bandy, PE Biaphen Barkovich Richard Lentz Joseph Bonaduco Aireza Edraki, PE, PMP McEven van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff	Track CAU Trans CAU Trans CAU Trans Rel Ops Rel Ops Comms Comms Sys. Integ Sys. Integ Sys. Integ Sys. Integ Sys. Integ Sys. Integ Sately & Sec. CAD ADMHN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 \$99.20 \$84.30 \$79.20 \$78.80 \$100.00	\$11 \$300			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 18 19 20	John Legath, PE Teny Chaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neal Water James Sgro Theodore Bandy, PE Stephen Barkovich Richard Lentz Joseph Bonaduca Amuta Edisti, PE, PMP McEwan van der Mandele, CPP Ratesh Rajagopal, PE SUPP Technical Suspon Staff Administrative Suppor Staff	Track CAU Trans CAU Trans CaV Trans Rai Ops Comms Comms Comms Sps. Integ. Signats Signats Signats Signats Signats Signats Signats Cathy & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Tydratics & Hydrology OKT STAFF Eng Staff CADY ADMIN OW	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$84.30 \$79.20 \$78.60 \$100.00 \$59.10 \$81.90 \$100.70 \$99.60 \$177.70 \$73.53 \$73.53	\$11 \$3 00 \$1,00			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 18 19 20	John Legath, PE Terry Ghaniz, PE Bryan Shoker, PE Greg Nazarow Ian Martin Neel Water James Sgro Theodore Bandy, PE Biaphen Barkovich Richard Leniz Joseph Bonaduce Alwess Edvaki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff Administrative Support Staff Administrative Support Staff Administrative Support Staff	Track CAU Trans CAU Trans CAU Trans Rel Ops Comms Comms Comms Sys. Integ. Sys. Integ. Signats Signats Safety & Sec. Safety & Sec. Hydraulica & Hydrology ORT STAFF Eng Slaff CAD/ADMIN OW ICAL STAFF	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$78.50 \$77.50 \$77.50 \$70.50 \$77.50 \$90.00 \$59.10 \$100.70 \$59.50 \$100.70 \$99.50 \$17.70 \$73.50 \$73.50 \$73.50 \$73.50 \$73.50 \$74.14 \$20.34%	\$11 \$3 00 \$1,00 \$80			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 19 20 21	John Legath, PE Teny Chaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neel Water James Syno Theodore Bandy, PE Bisphen Bandy, PE Bisphen Bandy, PE Bisphen Bandy, PE Supper Bonaduca Alweza Edraki, PE, PMP McEvan van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff HALEY & ALDRICH TECHN	Track CAU Trans CAU Trans CAU Trans Rel Ops Rel Ops Comms Comms Sys. Integ Sy	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 \$99.20 \$84.30 \$79.20 \$78.80 \$100.00	\$11 \$30 \$1 \$1 \$3 \$1,00 \$9			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 18 19 20 21	John Legath, PE Teny Chaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neal Water James Sgro Theodore Bandy, PE Baptes Bandyuch Richard Lentz Joseph Bonaduce Amera Ediski, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE Suppr Technical Sueport Staff Administrative Support Staff Technical Sueport Staff Matter S ALD/RICH TECHNI Ed Zaminskap, PE Project Engineer	Track CAU Trans CAU Trans CaV Trans Rai Ops Rai Ops Comms Comms Comms Comms Sps. Integ. Signats Signats Signats Signats Signats Signats Signats Signats CAU ADMIN CV CAL STAFF Lasd Geolechnical Eng. Project Engmeer	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$79.20 \$79.20 \$79.20 \$100.00 \$100.00 \$100.00 \$100.00 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.00 \$1	\$11 \$30 \$1 \$1 \$3 \$1,00 \$9			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 18 18 19 20 21 1 2 21	John Legath, PE Teny Chaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Nel Water James Sgro Theodore Bandy, PE Bisphen Barkovich Richard Leniz Joseph Bonaduca Alexa Edraki, PE Diseph Bonaduca Alexa Edraki, PE Pechnical Support Staff Administrative Support Staff Administrative Support Staff Pachers Europort Staff Project Engineeric Engineering Staff	Track CAU Trans CAU Trans CAU Trans Rai Ops Comms Comms Comms Sys. Integ. Syn. Integ. Syn. Integ. Syn. Integ. Safety & Sec. Safe	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$78.60 \$77.20 \$77.80 \$100.00 \$100.00 \$100.00 \$100.00 \$100.00 \$100.70 \$17.70 \$199.60 \$100.70 \$17.70 \$17.30 \$50.37 \$43.14 \$20.34%	\$11 \$3.00 \$1,00 \$80			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 18 19 20 21	John Legath, PE Teny Chaniz, PE Bryen Shober, PE Greb Nazarow Ian Martin Neel Water James Syno Theodore Bandy, PE Biaphen Barkovich Richard Leniz Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Joseph Bonaduca Jameza Ednaki, PE Project Engineeri Engineering Staff	Track CAU Trans CAU Trans CAU Trans Rel Ops Rel Ops Comms Sys. Integ Sys. Int	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$79.20 \$79.20 \$79.20 \$100.00 \$100.00 \$100.00 \$100.00 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.70 \$99.60 \$100.00 \$1	\$11 \$3.00 \$1,00 \$80			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 18 18 19 20 21 1 2 21	John Legath, PE Terry Chaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neel Water James Sgro Theodore Bandy, PE Staphen Bankovich Richard Lentz Joseph Bonaduce Alwaza Edaki, PE, PMP McEwan van der Mandele, CPP Rainesh Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff Freqel Engineer Engineering Staff Jamor Engineering Staff	Track Call Trans Call Trans Call Trans Rai Ops Rai Ops Comms Comms Comms Comms Sps. Integ. Signals Signals Signals Signals Signals Signals Signals Signals Call State Call Addition Coll State Call State Lasd Geolechnical Eng. Project Eng.Stat Call State	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$79.20 \$79.20 \$79.20 \$100.00 \$59.10 \$69.00 \$100.70 \$59.10 \$59.10 \$59.50 \$77.70 \$73.30 \$50.37 \$43.14 \$205.34% \$50.89 \$50.69 \$50.69 \$34.99	\$11 \$30 \$1,00 \$80			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 18 19 20 21 1 2 21	John Legath, PE Teny Chaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neel Water James Syro Theodore Bandy, PE Blaphen Bandy, PE SUPP Technical Support Staff HALEY & ALL/RUCH Frogenet Engineer Engineering Staff Jamor Engineer Engineering Staff Jamor Engineer SUPP CADC/ Project Astastan	Track CAU Trans CAU Trans CAU Trans Rel Ops Rel Ops Comms Comms Sys. Integ Sys. Integ Sys. Integ Sys. Integ Sys. Integ Sys. Integ Santa Satety & Sec. Satety & Sec. Satety & Sec. Satety & Sec. CAD ADMHN CAL STAFF Lasd Geolechnical Eng. Proper Eng Staff Leng Staff Leng Staff Leng Staff CAD ADMHN CH	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 \$99.20 \$84.30 \$79.20 \$78.60 \$173.70 \$00.00 \$100.00	\$11 \$30 \$1,00 \$80			
8 7 8 9 10 11 12 13 14 15 16 17 18 18 18 19 20 21 1 2 21	John Legath, PE Teny Chaniz, PE Bryen Shober, PE Greg Nazarow Ian Martin Neel Water James Syno Theodore Bandy, PE Stephen Barkovich Richard Lentz Joseph Bonaduca Airwaz Edraki, PE, PMP McEven van der Mandele, CPP Raimesh Balagopal, PE SUPP Technical Suspont Staff HALEY & ALDROCH Technical Suspont Staff HALEY & ALDROCH Ed Zaminskie, PE Project Engineer Engineering Staff SUPP CADDP Project Assistant GHTFIR KUNGNEERING	Track CAU Trans CAU Trans CAU Trans Rel Ops Rel Ops Comms Comms Sys. Integ Sys. Integ Sys. Integ Sys. Integ Sys. Integ Sys. Integ Santa Satety & Sec. Satety & Sec. Satety & Sec. Satety & Sec. CAD ADMHN CAL STAFF Lasd Geolechnical Eng. Proper Eng Staff Leng Staff Leng Staff Leng Staff CAD ADMHN CH	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$64.10 399.20 \$79.20 \$79.20 \$79.20 \$100.00 \$59.10 \$69.00 \$100.70 \$59.10 \$59.10 \$59.50 \$77.70 \$73.30 \$50.37 \$43.14 \$205.34% \$50.89 \$50.69 \$50.69 \$34.99	\$11 \$30 \$1,00 \$80			

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	HOURS		TOTAL SALARY	
-		NAIK CONSULTING GR	009 01	ERHEADRATE	127.09%		
		TE	CHNICAL STAFF				
		John Tan, PE	IPM	0	\$90.56	\$0	
		Rich Baron	SURV PM	0	\$58.30	\$0	
		Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0 \$0	
		Party Chief	SURV Inst. Tech.	0	\$37.21	\$0	
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0	
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0	
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45,79	\$0	
		Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0	
	9	Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	50	
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0	
2			JPPORT STAFF				
NAIK		CAD Manager	CAD Mgr	0	\$58.19	\$0	
Z	12	CAD Technicians	CAD Tech	0	\$30,54	\$0	
	ENVISION OVERHEAD RATE 137.51%						
			CHNICAL STAFF				
E 1		Kurt Buetter	Doc. Ctrl. Mgr	0	\$42.00	\$0	
lzi		Thomas Hartley	VE Team Lead	0	\$94.40	\$0	
121		Configuration Management	Config. Mgmt.	0	\$55.00	\$0	
ENVISION	4	Value Engineering Team	VE Team	0	\$75.52	\$0	
<u>2</u>			JPPORT STAFF				
Ē	5	Administration	Admin	0	\$21.40	\$0	
		JCMS		ERREAD RATE	117.32%		
141	-		CHINICAL STAFF				
JCMS		K. Meehan	Senior Est.	0	\$63.67	\$0	
181		Junior Estimator	Junion Est.	0	\$46.20	\$0	
Š.	3	Project Controls	PC	0	\$57.75	\$0	
100		RADIN		ERHEAD RATE	155.17%	-	
			CHNICAL STAFF			-	
l 🤶 I	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0	
RADIN	-		JPPORT STAFF				
R. I	2	Beth Uczynski	CADIN	0	\$38.21	\$0	
1 1		SJH		ERHEADRATE	140.00%	-	
			CHNICAL STÀFF				
	1	S. Jayakumaran	Civil Eng VIII	0	\$84.24	\$0	
ΞS	2	Senior Engineering Staff	Sen Eng Staff	0	\$59.58	\$0 \$0	
L of	3	Engineering Staff	Eng Staff	0	\$40.43	\$0	

TEAM SUMMARY		
TOTAL ESTIMATED HOURS 108		
Total Salary		\$8,035
Overhead		\$12,790
Subtotal		\$29,825
Fixed Fee	10%	\$2,083
Total Direct Costs		\$0
TOTAL COST		\$22,908

4 Robert Matthews, PE Civil Lead 0 \$79.20 5 Sterven Zapoticzny, PE SterChel 0 \$43.70 6 Agmestzka Lapoticzny, PE SterChel 0 \$43.70 7 John Legeth, PE Track 0 \$72.00 7 John Legeth, PE Track 0 \$87.10 8 Terry Shantz, PE CaU Trans 0 \$87.00 9 Bryan Shober, PE CaU Trans 0 \$87.30 10 Greg Nazzrow Rail Ops 0 \$79.20 11 Iam Martin Rail Ops 0 \$77.60 12 Net Water Comms 165 \$73.70 \$12.1 13 James Sgro Comms 40 \$50.00 \$3.6 14 Theodore Bankovich Sys. Integ 0 \$100.00 \$3.6 16 Stephen Bankovich Sys. Integ 0 \$100.00 \$3.6 17 Joseph Bonaducice Signatis 0 <td< th=""><th>1</th><th></th><th></th><th>STIMATE BY INDIVIDUA</th><th>LTASK</th><th></th><th></th></td<>	1			STIMATE BY INDIVIDUA	LTASK						
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NO. PERSON NAME PROJECT TITLE / DISCIPLINE ESTIMATED (VURS) HOURLY FATE (VURS) TOTAL SALA HARUDES IY & HARNOVEN OVERHEAD RATE 187.40% 187.40% 1 Charle Geer, PE PM, STR Eng VII 0 368.06 2 Charle Geer, PE CMA, STR Eng VII 0 368.06 3 Stree Hawan, PE CMA, STR Eng VII 0 360.03 4 Stree Hawan, PE CMCC, STR Eng VII 0 360.03 5 Stree Hawan, PE STR Eng VII 0 360.03 6 Peter Rocoy, PE STR Eng VII 0 360.04 7 MEchael Hawan, PE STR Eng VII 0 360.07 10 Ansole, PE ELEC Eng VI 0 370.29 10 Paul Connoly, PE STR Eng VIII 0 \$80.07 11 Gan Softeker, PE STR Eng VIII 0 \$75.13 11 Gan Softeker, PE STR Eng VIII 0 \$75.13 13 Mathack Yegus PF, PO STR Eng VIII <td></td> <td>4.12H</td> <td>Communications</td> <td></td> <td>HEH / GANN</td> <td></td> <td>N/</td>		4.12H	Communications		HEH / GANN		N/				
HARDES IY & HANOVER DRUNS IS7.40% 1 Vista Szumarski, PE PM, STR Erg VII 0 \$96.56 2 Charle Geer, PE Risk Manager 0 \$96.51 3 David Tuchman, PE OPM, STR Erg VII 0 \$30.51 4 Steve Hartacker, PE, EE OXOC, STR Erg VII 0 \$30.31 5 Steve Hom, PE STR Erg VII 0 \$30.51 5 Steve Hartacker, PE, EE STR Erg VII 0 \$30.51 6 Peter Roody, PE STR Erg VII 0 \$30.56 7 McLotel Hawkan, PE STR Erg VII 0 \$30.56 9 Avar Noble, PE ELEC Erg VI 0 \$30.0729 10 Gas Softekker, PE, SS STR Erg VII 0 \$37.53 11 Gas Softekker, PE, SS STR Erg VII 0 \$37.53 12 Raymond Manchaek, PE STR Erg VII 0 \$37.53 13 Mantarker Yegan, PE, PD STR Erg VII 0 \$44.04	Ì			PROJECT TITLE / DISCIPLINE	ESTIMATED	1					
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12 Reymond Mantbadi, PE STR Eng Vill 0 \$865.56 13 Midnac Yegun, PE, PhD STR Eng Vill 0 \$376.13 14 Clavid Marco, PE, SE STR Eng Vill 0 \$376.13 16 David Gender, PE STR Eng Vill 0 \$376.13 16 David Gender, PE STR Eng Vill 0 \$376.53 17 Drew DeteDonne, RA STR Eng Vill 0 \$346.04 19 Support Staff SUPPORT STAFF 0 \$446.04 20 Support Staff ELEC I.V 0 \$446.04 21 Support Staff CLEC I.V 0 \$46.04 21 Support Staff CLEC I.V 0 \$46.04 21 Support Staff CLEC I.V 0 \$43.70 3 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>5</td>							5				
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5 Steven Zapoticzny, PE Ske/Civit 0 \$43,76 6 Agneszkika Laponski, PE Structural 0 \$72,00 7 John Legeth, PE Track 0 \$82,10 8 Tenry Shantz, PE CaV Trans 0 \$99,20 9 Bryan Shober, PE CaV Trans 0 \$84,30 10 Greg Nazzrow Rail Ops 0 \$77,20 11 Ian Martin Rail Ops 0 \$77,80 12 Ned Walter Comms 40 \$50,00 13 James Egro Comms 40 \$50,00 14 Theodore Bandy, PE Sys. Integ. 0 \$100,00 15 Stephen Barkovich Sys. Integ. 0 \$100,00 16 Marcza Edraki, PE, PMP Safety & Sec. 0 \$90,00 17 Joseph Bonaducic Signats 0 \$100,70 18 Marcza Edraki, PE, PMP Safety & Sec. 0 \$90,60 18		-									
6 Agnesizka Lapinski, PE Sr. Structural 0 \$72.00 7 John Legath, PE Track 0 \$84.10 8 Terry Shartz, PE Cat/ Trans 0 \$84.10 9 Bryan Shober, PE Cat/ Trans 0 \$89.20 9 Bryan Shober, PE Cat/ Trans 0 \$89.20 10 Is ne Martin Ral Ops 0 \$77.60 11 Ism Martin Ral Ops 0 \$77.60 12 Neel Water Comms 165 \$73.70 \$12,1 13 James Sgro Comms 165 \$77.70 \$12,1 13 James Sgro Comms 40 \$80.00 \$3.6 14 Theodore Barkovich Sys. Integ 0 \$100.00 \$3.6 16 Richard Lentz Signals 0 \$100.07 \$31.00 \$3.6 17 Joseph Bonaduce Signals 0 \$100.70 \$381.90 \$3100.70 \$37.30 \$31.90 <td>18</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	18										
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HALLEY & ALDRUCH DESCRIPTION OVERHEAD NATE 220.94% TECHNICAL STAFF OVERHEAD NATE 220.94% 1 [Ed Zaminsbie, PE] Laad Geotechnical Eng. 0 \$84.06 2 Project Engineer Project Engineer 0 \$50.60 3 Engineering Staff Eng Staff 0 \$50.60 4 Junior Engineering Staff J.r. Eng Staff 0 \$34.96 5 [CADD/Project Assistant] [CAD/ADMIN] 0 \$30.30 GRIFF INT ENGINEERING OVERHEAD RATE 182.38% TECHNICAL STAFF OVERHEAD RATE 182.38%	1			Sys. Integ.	0	\$59.10					
HALLEY & ALDRUCH DESCRIPTION OVERHEAD NATE 220.94% TECHNICAL STAFF OVERHEAD NATE 220.94% 1 [Ed Zaminsbie, PE] Laad Geotechnical Eng. 0 \$84.06 2 Project Engineer Project Engineer 0 \$50.60 3 Engineering Staff Eng Staff 0 \$50.60 4 Junior Engineering Staff J.r. Eng Staff 0 \$34.96 5 [CADD/Project Assistant] [CAD/ADMIN] 0 \$30.30 GRIFF INT ENGINEERING OVERHEAD RATE 182.38% TECHNICAL STAFF OVERHEAD RATE 182.38%	Í						\$				
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2 Project Engineer 0 \$60.50 3 Engineering Staff Eng Staff 0 \$50.69 4 Junior Engineering Staff 0 \$34.69 5 GADDV Project Assistant [CADVADAMIN] 0 \$30.30 GRIFFIN ENGINEERING OVERHEAD RATE \$2.39% TECHNICAL STAFF 1 12.39%		1			0	554 0AI	- 8				
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SUPPORT STAFF 5 ICADD/ Project Assistant [CAD/ ADAIN 0] \$30.30] GRIFFIN ENGINEERING GRIFFIN ENGINEERING TECHNICAL STAFF	ŀ										
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GRUFFIN ENGINEERING OVERHEAD RATE 182,38%	ł	5									
TECHNICAL STAFF	4	2									
	ŀ			UTAL PLACE	INICAU NAIE	192.30%					
1 Joe Griffin, PE Const. Rev. 0 \$90.00				Const. Rev.		\$90.001	\$				

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY
111		NAIK CONSULTING GR		ERHEAD RATE	127.09%	
	_	te	CHINICAL STAFF			
		John Tan, PE	PM	0	\$90.56	\$0
	2	Rich Baron	SURV PM	0	\$58.30	\$0
	3	Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0
	4	Party Chief	SURV Inst. Tech.	0	\$37.21	\$0
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45,79	\$0
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0
1.2	8	Senior Structural Engineer	STR Sen, Eng.	0	\$54.50	\$0
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0
	_	si	IPPORT STAFF			
N	11	CAD Manager	CAD Mar	0	\$58,19	\$0
2	12	CAD Technicians	CAD Tech	0	\$30,54	\$0
	-	ENVISION	OV	RHEADRATE	137.51%	
		TE	CHINICAL STAFF			
		Kurt Buettler	Doc. Ctrl. Mgr	0	\$42.00	\$0
z		Thomas Hartley	VE Team Lead	0	\$94.40	\$0
Q		Configuration Management	Config. Mgmt.	Ŏ	\$55.00	\$0
Ω.	4	Value Engineering Team	VE Team	0	\$75.52	\$0
ENVISION			IPPORT STÄFF			
Ξ	5	Administration	Admin	0	\$21.40	\$0
		JCMS	OV	RHEADRATE	117,32%	
	-		CHNICAL STAFF			
S,		K. Meehan	Senior Est.	Ó	\$63.67	\$0
JCHS	2	Junior Estimator	Junion Est.	0	\$46.20	50
¥.	3	Project Controls	PC	0	\$57.75	\$0
	10000	RADIN	ove	RHEAD RATE	155.17%	
			CHNICAL STAFF			
Ę	1	Chtra Radin	Disc. Lead	0	\$100.00	\$0
RADIN		SL	IPPORT STAFF			
5	2	Beth Uczynski	CAD IV	0	\$38,21	\$0
		SJH	OVE	RHEAD RATE	140.00%	
	-	TEC	HINICAL STAFF			
1	1	S. Jayakumaran	Civil Eng VIII	0	\$84,24	\$0
SLH	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0
တိ	3	Engineering Staff	Eng. Staff	0	\$40.43	\$0

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	650		
Total Salary			\$39,884
Overhead			\$63,164
Subtotal			\$102,848
Fixed Fee		10%	\$10,285
Total Direct Costs			\$162
TOTAL COST			\$113,294

HARDES I Y & HANOVER OVERHEAD RATE 187.495 TECHNICAL STAFF 0 \$96.86 2. Charle Ger, PE Risk Manager 0 \$96.86 3. David Tuckman, PE DPM, STR Eng VII 0 \$96.01 4. Steve Heincker, PE. Risk Manager 0 \$96.01 5. Sieve Horn, PE DPM, STR Eng VII 0 \$81.61 4. Sieve Heincker, PE. SE QAOC, STR Eng VII 0 \$80.51 7. Michael Hawkins, PE STR Eng VII 0 \$80.51 \$ 8. Peter Roody, PE STR Eng VII 40 \$80.51 \$ 9. Alex Noble, PE Michael Hawkins, PE STR Eng VIII 40 \$80.53 \$ 9. Alex Noble, PE ELEC Eng VI 50 \$77.29 \$ 10. Paul Connody, PE STR Eng VIII 0 \$80.09 \$ 11. Glein Schetsich, PE STR Eng VIII 0 \$80.56 \$ 12. Raymond Manbady PE STR Eng VIII 0 \$76.13 \$ 13. Manbar Vegaue, PE, PhD STR Eng VIII <t< th=""><th>HOURLY RATE TOTAL SALARY E 157.40% 0 \$96.06 \$0 0 \$61.61 \$3 0 \$72.32 \$2 0 \$80.39 \$3 0 \$30.39 \$3 0 \$80.51 \$4.322 0 \$106.14 \$4.246</th><th>FIRM: H&H / GANNI ESTIMATED</th><th></th><th></th><th></th></t<>	HOURLY RATE TOTAL SALARY E 157.40% 0 \$96.06 \$0 0 \$61.61 \$3 0 \$72.32 \$2 0 \$80.39 \$3 0 \$30.39 \$3 0 \$80.51 \$4.322 0 \$106.14 \$4.246	FIRM: H&H / GANNI ESTIMATED								
NO. PERSON NAME PROJECT TITLE / DISCIPLINE ESTIMATED HOURS HOURLY PATE TOTAL SA HARDDESTY & HARNOVER OVERHEAD RATE 107.40% 107.40% 1 Misha Sizumanski, PE PM, STR Eng VII 0 \$96.56 2 Charling Gen, PE PM, STR Eng VII 0 \$96.56 3 David Tuckman, PE CPM, STR Eng VII 0 \$80.39 4 Steve Harlacker, PE, SE CAQC, STR Eng VII 0 \$80.39 5 Steve Hom, PE STR Eng VII 0 \$80.39 \$80.39 6 Peter Roody, PE STR Eng VIII 60 \$86.31 \$8 7 Michael Hawkns, PE STR Eng VIII 0 \$80.50 \$10.51 8 Steve Mikubuk, PE MECHEng VIII 0 \$80.50 \$10.50 10 Raymond Mankback, PE STR Eng VIII 0 \$10.576.51 11 Gate Schreikch, PE STR Eng VII 0 \$172.25 11 Gate Schreikch, PE STR Eng VII 0 \$172.25	HOURLY RATE TOTAL SALARY E 157.40% 0 \$96.06 \$0 0 \$61.61 \$3 0 \$72.32 \$2 0 \$80.39 \$3 0 \$30.39 \$3 0 \$80.51 \$4.322 0 \$106.14 \$4.246	ESTIMATED		Cost & Schadula	4 1 21					
NO. PERSON NAME PROJECT TITLE / DISCIPLINE ESTIMATED HOURS HOURLY PATE TOTAL SA HARDDESTY & HARNOVER OVERHEAD RATE 107.40% 107.40% 1 Misha Sizumanski, PE PM, STR Eng VII 0 \$96.56 2 Charling Gen, PE PM, STR Eng VII 0 \$96.56 3 David Tuckman, PE CPM, STR Eng VII 0 \$80.39 4 Steve Harlacker, PE, SE CAQC, STR Eng VII 0 \$80.39 5 Steve Hom, PE STR Eng VII 0 \$80.39 \$80.39 6 Peter Roody, PE STR Eng VIII 60 \$86.31 \$8 7 Michael Hawkns, PE STR Eng VIII 0 \$80.50 \$10.51 8 Steve Mikubuk, PE MECHEng VIII 0 \$80.50 \$10.50 10 Raymond Mankback, PE STR Eng VIII 0 \$10.576.51 11 Gate Schreikch, PE STR Eng VII 0 \$172.25 11 Gate Schreikch, PE STR Eng VII 0 \$172.25	HOURLY RATE TOTAL SALARY E 157.40% 0 \$96.06 396.01 396.01 372.32 \$80.39 380.39 380.39 380.39 380.39 380.39 380.51 380.51 380.51 380.51 380.51	ESTIMATED								
Inc. PERSON RAME PROJECT ITTLE / DSCRUME HOURS HOURS TARE TOTAL SA I Mate Scimanski, PE PM, STR Eng VII 0 \$96,95 2 Charle Geer, PE Rik Manager 0 \$96,95 3 David Tuckman, PE DPM, STR Eng VII 0 \$81,61 4 Steve Hom, PE DPM, STR Eng VII 0 \$81,61 5 Steve Hom, PE STR Eng VII 0 \$80,01 6 Peter Roody, PE STR Eng VII 0 \$80,51 \$80,51 7 Michael Hawkins, PE STR Eng VII 40 \$80,51 \$80,51 8 Seve Maucki, PE ELEC Eng VII 40 \$80,63 \$80,50 10 Paus Connoby, PE STR Eng VII 0 \$100,76 \$11 12 Raymould Marck, PE STR Eng VII 0 \$172,52 13 Jatra VA Marck, PE, SEE STR Eng VII 0 \$172,53 14 David Marck, PE, SEE STR Eng VII 0 \$172,53	E 187.40% 0 \$96.56 \$8 0 \$90.01 \$6 0 \$81.61 \$3 0 \$72.32 \$6 2 \$80.39 \$3 0 \$80.51 \$4.322 0 \$106.14 \$4.246									
TECHNICAL STAFF 1 Visha Szumanski, PE PM, STR Eng VII 0 \$96,01 2 Charle Geer, PE Pixk Manager 0 \$96,01 3 David Tuckman, PE DPM, STR Eng VII 0 \$81,81 4 Skeve Hom, PE DPM, STR Eng VII 0 \$81,81 4 Skeve Hom, PE STR Eng VII 0 \$80,51 \$ 6 Peter Roody, PE STR Eng VII 40 \$106,14 \$ 8 Steve Maucki, PE MECh Eng VII 40 \$360,59 \$ 9 Azex Noble, PE ELEC Eng VII 40 \$360,59 \$ 10 Paut Connoby, PE STR Eng VII 0 \$106,78 \$ 12 Raymond Menbbade, PE STR Eng VII 0 \$772,35 \$ 13 Mahae Yegien, PE, PED STR Eng VII 0 \$776,35 \$ 13 Mahae Yegien, PE, PED STR Eng VII 0 \$776,35 \$ 14 David Geher, PE	\$96.86 \$8 0 \$96.01 34 0 \$81.61 54 0 \$72.32 54 0 \$80.39 58 0 \$806.51 \$4.32 0 \$86.51 \$4.24	HOURS	PROJECT TITLE / DISCIPLINE	PERSON NAME	NO,					
1 Visha Soumanski, PE PM, STR Eng VII 0 \$56,80 2 Charler Geer, PE Risk Manager 0 \$58,80 4 Steve Hanz, PE DPM, STR Eng VII 0 \$81,81 4 Steve Hanz, PE STR Eng VII 0 \$82,22 5 Steve Hanz, PE STR Eng VII 0 \$80,35 6 Pater Roody, PE STR Eng VIII 60 \$86,51 \$ 7 Michael Hawkins, PE STR Eng VIII 60 \$86,65 \$ 9 Arex Noble, PE ELECE Eng VI 60 \$\$86,33 \$ 9 Arex Noble, PE ESTR Eng VIII 0 \$\$100,76 \$ 11 Glass Schreiskin, PE STR Eng VIII 0 \$\$100,76 \$ 12 Raymond Manback, PE STR Eng VII 0 \$\$76,13 \$ 13 Mahanz Yegen, PE, PD STR Eng VII 0 \$\$76,33 \$ 13 Bauve Schreiskin, PE STR Eng VII 0 \$\$76,33	\$98.01 34 0 \$81.61 \$4 0 \$72.32 \$4 0 \$80.39 \$4 0 \$80.51 \$4,324 0 \$106.14 \$4,246	RHEAD RATE			-					
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g 20 TECHNICAL SUPPORT Stating 4 \$50,371 21 Administrative Support Stating CADX ADMIN 0 \$43,141 HALLEY & ALLDRICH OVERHEAD RATE 220,84% TECHNICAL STAFF TECHNICAL STAFF 1 Edit Zaminshae, PE Lead Geotechnical Eng. 0 \$80,850 2 Project Engineer Project Engineer 0 \$50,650 3 Engineering Staff Eng Staff 0 \$50,659 4 Junice Engineering Staff Jr. Eng Staff 0 \$334,99 5 CADD Project Assistant (CAD ADMIN) 0 \$30,301 GRIP FINI EINGINNEERUING OVERHEAD RATE \$32,39% \$333,398		0								
20 FECHNICEI SUPPORT Stein Endy. Staff 4 \$50.371 21 Administrative Support Staff CAD2 ADMIN 0 \$43.14 HALLEY & ALLDRICH OVERHEAD RATE 220.84% TECHNICAL STAFF TECHNICAL STAFF 1 Ed Zaminskae, PE Lead Geotechnical Eng. 0 \$80.66 2 Project Engineer Project Engineer 0 \$50.69 3 Engineering Staff Eng Staff 0 \$30.69 4 Junior Engineering Staff Jr. Eng Staff 0 \$33.49 5 CADD Project Assistant CAD ADMIN 0 \$30.30 GRIEFEN ENGINEERING OVERHEAD RATE \$32.39%	\$77.70 \$0	0	Safety & Sec.	McEwan van der Mandele, CPP						
g 20 TECHNICAL SUPPORT Stating 4 \$50,371 21 Administrative Support Stating CADX ADMIN 0 \$43,141 HALLEY & ALLDRICH OVERHEAD RATE 220,84% TECHNICAL STAFF TECHNICAL STAFF 1 Edit Zaminshae, PE Lead Geotechnical Eng. 0 \$80,850 2 Project Engineer Project Engineer 0 \$50,650 3 Engineering Staff Eng Staff 0 \$50,659 4 Junice Engineering Staff Jr. Eng Staff 0 \$334,99 5 CADD Project Assistant (CAD ADMIN) 0 \$30,301 GRIP FINI EINGINNEERUING OVERHEAD RATE \$32,39% \$333,398					19					
20 FECHNICEI SUPPORT Stein Endy. Staff 4 \$50.371 21 Administrative Support Staff CAD2 ADMIN 0 \$43.14 HALLEY & ALLDRICH OVERHEAD RATE 220.84% TECHNICAL STAFF TECHNICAL STAFF 1 Ed Zaminskae, PE Lead Geotechnical Eng. 0 \$80.66 2 Project Engineer Project Engineer 0 \$50.69 3 Engineering Staff Eng Staff 0 \$30.69 4 Junior Engineering Staff Jr. Eng Staff 0 \$33.49 5 CADD Project Assistant CAD ADMIN 0 \$30.30 GRIEFEN ENGINEERING OVERHEAD RATE \$32.39%				SUPP						
21 Administrative Support Staff CADLADMIN 0 \$43,14 HALLEY & ALDHICH OVERHEAD RATE 220,84% TECHNICAL STAFF 1 Ed Zaministia, PE Lead Geotechnical Eng. 0 \$84,05 2 Project Engineer Project Engineer 0 \$80,85 3 Engineering Staff 0 \$50,89 4 Junior Engineering Staff Jr. Eng Staff 0 \$34,99 SUPPORT STAFF 5 [CADD Project Assistant [CAD ADMIN 0 \$30,30 GRIFERUNG GADD Project Assistant GADD Project Assistant GADD Project Assistant GRIFERUNG GADD Project Assistant GADD Project Assistant GADD Project Assistant GADD ADMIN OVERHEAD RATE	\$50.37 \$201	4			20					
HALLEY & ALDRICH OVERHEAD RATE 220.84% TECHNICAL STAFF 1 Ed Zaminska, PE Lead Geotechnical Eng. 0 \$80.80 2 Project Engineer 0 \$50.89 3 Engineering Staff 0 \$50.89 3 Engineering Staff Eng Staff 0 \$30.69 334.99 4 Junior Engineering Staff Jr. Eng Staff 0 \$334.99 5 [CADD Project Assistant GRIEFEN ENGINEERIING OVERHEAD RATE \$350.30			CADY ADMIN	Administrative Support Staff						
TECHNICAL STAFF 1 Ed Zaminskie, PE Laad Gedechnical Eng. 0 \$84.06 2 Project Engineer 0 \$60.60 3 Engineering Staff Eng Staff 0 \$50.69 4 Junior Engineering Staff Jut Eng Staff 0 \$34.99 5 [CADD/ Project Assistant CADD/ ADMIN 0 \$30.30 GRIFFIN EINGINEERUING OVERHEAD RATE \$32.39%				HALLEY & ALURICH	the second second					
1 Ed Zammska, PE Lead Geotechnical Eng. 01 \$84.081 2 Project Engineer Project Engineer 0 \$60.50 3 Engineering Staff Eng Staff 0 \$50.69 4 Junior Engineering Staff Jr. Eng Staff 0 \$30.69 5 [CADD/ Project Assistant [CADJ / ADMIN 0] \$30.30] GRIFFIN EINGINEERUING OVERHEAD RATE \$32.38%				TECH						
2 Project Engineer 0 \$60.50 3 Engineering Staff Eng Staff 0 \$50.69 4 Junior Engineering Staff Jr. Eng Staff 0 \$34.99 5 CADD/ Project Assistant (CAD/ ADMIN 0 \$30.30 GRUE FIN ENGINEERUNG OVERHEAD RATE \$32.30%	8 \$84.051 \$0	- 01			1					
3 Engineering Staff Eng Staff 0 350.69 4 Junior Engineering Staff Jr. Eng Staff 0 334.99 5 CADD/ Project Assistant GRUP FIN ENGINEERING CADD/ ADMIN 0 \$30.30					2					
4 Junior Engineering Staff Jr. Eng Staff 0 \$34.99 5 CADD/ Project Assistant (CAD/ ADMIN) 0 \$30.30 5 [CADD/ Project Assistant (GRIFFIN EINGINEERIING) 0 \$30.30										
SUPPORT STAFF 5 [CADD/ Project Assistant [CAD/ ADMIN 0] 330 30] GRIFFIN ENGINEERIING OVERHEAD RATE 132.38%										
GRIFFIN ENGINEERING OVERHEAD RATE 112,35%	1 3-34.881 \$U	U			-					
GRIPFIN ENGINEERING OVERHEAD RATE 112,35%				In AD IV Demont Assistant	5					
				LOUGH FUN BRITANS	9					
TECHNICAL STAFF	182.30%	NICAU KATE			-					
1 Joe Grifin, PE Const. Rev. 0 \$90.00	\$90.00 \$0				-					

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY
		NAIK CONSULTING GR	00P 0V	RHEAD PATE	127.05%	-
		TE	CHNICAL STAFF			
		John Tan, PE	PM	0	\$90.56	\$0
		Rich Baron	SURV PM	0	\$58,30	\$0
	3	Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0
	. 4	Party Chief	SURV Inst. Tech.	0	\$37.21	\$0 \$0
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0
	7	Senior Uility Engineer	UTIL Sen, Eng.	0	\$45,79	\$0
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0
84	9	Senior Structural Engineer	STR Sen. Eng.	24	\$54.50	\$1,308
	10	Structural Engineering Staff	STR Eng Staff	32	\$29.22	\$935
~	-	ઠા	IPPORT STAFF			
NAIK		CAD Manager	CAD Mgr	0	\$58,19	\$0
2	12	CAD Technicians	CAD Tech	0	\$30.54	\$0
	-	ENVISION	OVE	RHEAD RATE	137.51%	
	-	TE	CHNICAL STAFF			
		Kurl Buettler	Doc. Ctrl. Mgr	Ø	\$42.00	\$0
z	2	Thomas Hartley	VE Team Lead	0	\$94.40	\$0 \$0
٥I	3	Configuration Management	Config. Mgrit.	0	\$55.00	\$0
<u> 9</u>	- 4	Value Engineering Team	VE Team	0	\$75.52	\$0
ENVISION	-	SL	IPPORT STAFF	-		
<u>ت</u>	5	Administration	Admin	0	\$21.40	\$0
	-	JCMS	OVE	RHEAD RATE	117,32%	
52			CHNICAL STAFF			
JCMS	1	K. Meehan	Senior Est.	230	\$63.67	\$14,644
횴	2	Junior Estimator	Junion Est.	144	\$46,20	\$6.653
×.	3	Project Controls	PC	104	\$57.75	\$6.006
		RADIN	OVE	RHEAD RATE	155,17%	
			CHINICAL STAFF			
롲	1	Chilra Radin	Disc. Lead	0	\$100.00	\$0
RADIN			NPPORT STAFF			
2	2	Beth Uczynski	CADIV	0	\$38.21	\$0
		SJH		RHEAD RATE	140.00%	
			CHNICAL STAFF			
	1	S. Jayakumaran	Civil Eng Vill	16	\$84.24	\$1,348
통	2	Senior Engineering Staff	Sen. Eng Staff	32	\$59.58	\$1,907
ŵ	3	Engineering Staff	Eng. Staff	0	\$40.43	\$0

TEAM SUM	ARY		
TOTAL ESTIMATED HOURS	1,144		-
Total Salary			\$68,759
Overhead			\$95,127
Subtotal			\$164,886
Fixed Fee		10%	\$18,485
Total Direct Costs			50
TOTAL COST			\$181,374

	ASK:		STIMATE BY INDIVIDUA	FIRM:					
1		Supplemental Survey			ETT FLEMING	.IV			
L	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	-			
Т	-	HARDESTY & HANOVER		RIPEAD RATE	157,40%				
			NICAL STAFF		-	and the second se			
Ŀ	1	Msha Szumanski, PE	PM STR Eng VIII	0		3			
Ŀ	2	Charle Geer, PE	Risk Manager	0		5			
I-	3	David Tuckman, PE Steve Harlacker, PE, SE	DPM, STR Eng VII	0					
IH:	5	Steve Hom, PE	QAQC. STR Eng VI						
H	6	Peter Roody, PE	STR Eng VII	0		3			
E	7	Michael Hawkins, PE	STR Eng VIII	0					
Ŀ	8	Sleve Mikucki, PE	STR Eng VIII MECH Eng VII	0					
E	9	Alex Noble, PE	ELEC Eng VI	0	\$86.43 \$70.29				
Ŀ	10	Paul Connolly, PE	STR Eng VI	0	\$70.29				
E	11	Gain Schetelich, PE	STR Eng VIII	0					
F	12	Raymond Mankbadi, PE	STR Eng VIII	0	\$86.58				
F	13	Mishac Yesian, PE, PhD	STR Eng VIII	0	\$76.13				
	14	Mishac Yegian, PE, PhD David Marcic, PE, SE	STREngVI	0	172.55	3			
Г	15	Jerry DilAeggio.PE	STR Eng VIII	0					
E	16	David Gerber, PE	STR Eng VI	0		5			
E	17	Drew DeleDonne, RA	STR Eng VI	0	\$69.83	3			
E	-		ORT STAFF						
L	18	Support Stalf	STRIV	0		\$			
L	19	Support Staff	MECHIN	D		5			
F	20	Support Staff Support Staff	ELEC IV	0		5			
+-	21	GANNETT FLEMING	CAD/ ADMIN	0	\$37.23	3			
TECHNICAL STAFF									
H	2	Richard Cross. PE		0	\$105.40	\$			
H	3	Bruce Smith	Rail Sys. Lead Guality Control	0	\$64.70 \$63.60				
F	4	Robert Methews, PE	Civil Lead	0	\$79,20	5			
F	5	Steven Zapoliczny, PE	SANCINI	0	\$43.70	5			
F	6	Agniesztka Lapinski, PE	Sr. Structural	0	\$72.00	i			
	1	John Legath, PE	Track	0	\$64.10	j.			
F	8	Terry Shantz, PE	Call Trans	0	\$19.20	-			
Г	3	Bryen Shober, PE	Cal/ Trans	0	\$84.30				
	10	Greg Nazarow	Rail Ops	0	\$79.20	\$			
	11	lian Martin	Rail Ops	0	\$78.60	3			
	12	Neil Water	Comms	0	\$73.70	3			
E	13	James Sgru	Comms	0	\$90.00	5			
	14	Theodore Bandy, PE	Sys. Integ.	0	\$100.00	3			
L	15	Stephen Barkovich	Sys. Inleg	0	\$59.10	\$			
-	16	Richard Lentz	Signata	0	\$81.90	\$			
F	17	Joseph Bonaduce	Signaia	Ó	\$100.70	\$			
F	18	Aireza Edoski, PE, PMP	Safety & Sec.	0	\$99.60				
F	18	McEwan van der Mandele, CPP	Safety & Sec.	0	\$77.70	3			
F	19	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30	3			
F	20		ORT STAFF						
F	21	Technical Support Staff Administrative Support Staff	Eng Staff GAOF ADMIN	0	\$50.37 \$43.14	5			
	-	HALEY & ALDRICH	CALCULATION PROPERTY	RHEADTATE	220,54%	\$			
F	-		HCAL STAFF	AND AD INATE	220.04 %	-			
	1	Ed Zaminskie, PE	Lasd Geolechnical Eng.	0	334.001	-			
F	2	Project Engineer	Projeci Engineer	0	\$60.60	3			
F	3	Engineering Staff	Eng Staff	0	\$50.69	3			
	4	Junior Engineering Staff	Jr. Eng Statl	0	\$30.69	5			
	-		ORT STAFF						
F	-		CADI ADMIN	0					
F	5	CADD/ Project Assistant	CODE OUNHINE	U	\$30.30	2			
F	6	GRUFFIN ENGINEERING		RHEAD RATE	182,30%	8			

	NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL BALARY
	-0	NAIK CONSULTING GR		ERHEAD RATE	127.09%	
			CHNICAL STAFF			
	1	John Tan, PE	PM	12	\$90.56	\$1,087
		Rich Baron	SURV PM	16	\$58.30	\$933
		Project Surveyor	SURV Proj. Surv.	28	\$47.50	\$1,330
		Party Chief	SURV Inst. Tech.	140	\$37.21	\$5.209
	5	Instrument Technician	SURV Inst. Tech.	140	\$28.62	\$4,007
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74,66	\$0
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45.79	\$0
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37 79	\$0
	9	Senior Structural Engineer	STR Sen. Eng.	0	\$54,50	\$0
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0
~		SI	IPPORT STAFF			
NAIK		CAD Manager	CAD Mgr	8	\$58,19	\$466
ź.	12	CAD Technicians	CAD Tech	140	\$30,54	\$4,276
		ENVISION	OV	RHEAD RATE	137.51%	
	-		CHINICAL STAFF			
	1	Kurt Buetter	Doc. Ctrl. Mgr	Ó	\$42.00	5.0
z	2	Thomas Hartley	VE Team Lead	Ö	\$94.40	\$0 \$0
Q		Configuration Management	Config. Mgmt.	0	\$55.00	\$0
≌	. 4	Value Engineering Team	VE Team	0,	\$75.52	\$Ó
ENVISION			JPPORT STAFF			
	5	Administration	Admin	Ő	\$21.40	\$0
	-	JCMS		ERHEAD RATE	117.32%	
			CHINICAL STAFF			
1 22	1	K. Mééhan	Senior Est.	Ój	\$63.67	\$0
CINS	2	Junior Estimator	Junion Est.	0	\$46.20	\$0
×.	3	Project Controls	PC	0	\$57 75	\$0
17	-	RADIN		RHEAD RATE	155,17%	
			CHNICAL STAFF			
I É I	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0
RADIN	-		IPPORT STAFF			
	2	Beth Uczynski	CADIV	0	\$38,21	\$0
	-	SJH		RHEAD RATE	140.00%	and the second second
			CHINICAL STAFF			
	1	S Jayakumaran	Civil Eng Vill	0	\$84.24	\$0
H-S	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$Ó
ன்	3	Engineering Staff	Eng Staff	0	\$40.43	\$0

TEAM SUMMARY			
TOTAL ESTIMATED HOURS	454	_	
Total Salary			\$17,503
Overhead			\$21,995
Subtotal			\$39,303
Fixed Fee		10%	\$3,93
Total Direct Costs			\$4
TOTAL COST	and the second	_	\$43,23

-	4.14 NO.	ROW / Property		FIRM: H&H / GANNE	ETT EL EMING				
		ROW / Property		H&H / GANNE	ETT EL EMINO	457			
					STITUTED IN CONTROL OF	9 Y			
		PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR			
		HARDESTY & HANOVER	OV	RHEAD RATE	157,40%				
		TECH	ICAL STAFF						
	1	Visha Szumanski, PE	PM, STR Eng VIII	0	\$95.86				
	2	Charle Geer, PE	Risk Manager	0	\$96.01	5			
	3	David Tuckman, PE	OPM, STR Eng VII	0	\$81.81	1			
	4	Sleve Harlacker, PE, SE	QAQC, STR Eng VI	0	\$72.32				
	5	Steve Horn, PE	STR Eng VII	0	\$80.39				
	6	Peter Roody, PE	STR Eng VIII	0	\$86.51	5			
	7	Michael Hawkins, PE	STR Eng Vill	Ö	\$105.14	1			
	8	Sleve Mikucki, PE	MECH Eng Vil	0	\$85.43	1			
	9	Alex Noble, PE	ELEC Eng VI	Ó	\$70.29	5			
	10	Paul Connolly, PE	STR Eng VII	0	\$80.09	1			
	11	Gien Schetelich, PE	STR Eng VIII	0	\$109.79				
	12	Raymond Mankbadi, PE	STR Eng Vill	0	\$86.58	5			
	13	Mishac Yegian, PE, PhD	STR Eng Vill	0	\$76,13				
	14	David Marcic, PE, SE	STR Eng VI	Ö	\$72.55				
	15	Jerry DiMaggio,PE	STR Eng Vill	0	\$76.13				
	16	David Gerber, PE	STR Eng VI	0	\$75.63				
	17	Drew DeleDonne, RA	STR Eng VI	0					
	_	SUPP	ORT STAFF						
	18	Support Staff	STRIV	0	\$46.04				
	19	Support Staff	MECHIV	ő	\$46.04				
	20	Support Staff	ELECIV	0	\$46.04				
	21	Support Staff	CAD/ ADMIN	0	\$37.23				
		GANNETTFLEMING		RHEADRATE	159.17%				
	TECHNICAL STAFF								
	1	Richard Cross, PE	DPM I	0	\$105.40				
	2	David Howell, PE	Rail Sys. Load	0	\$64,70				
	3	Bruce Smith	Quality Control	0	\$63.80				
IH-	4	Robert Matthews, PE	Civil Lead		\$79.20				
	5	Steven Zapobczny, PE	Sie/Ch/I	0	\$43.70				
	6	Agnieszika Lapinski, PE	Sr Structural		\$72.00				
I-	7	John Legath, PE	or biruciurai Track	0					
I-	<u>í</u>	Terry Shantz, PE	Cal/ Trans	- 0	\$64,10 \$99,20				
	9	Bryan Shober, PE	Cat/ Trans						
	-			0	\$84.30				
	10	Greg Nazarow	Rail Ops	0	\$79.20	5			
	11 12	lan Martin	Rail Ops	0	\$76.60	\$			
		Neil Water	Comms	0	\$73.70				
	13	James Sgro	Comms	0	\$90.00	5			
	14	Theodore Bandy, PE	Sys. Integ	Ó	\$100.00				
	15	Slephen Barkovich	Sys. Integ	0	\$59.10	5			
	16	Richard Leniz	Signals	0	\$81.90	5			
	17	Joseph Bonaduce	Signals	0	\$100.70	\$			
	18	Alireza Edraki, PE, PMP	Safety & Sec.	0	\$99.60				
	18	McEwan van der Mandele, CPP	Salety & Sec.	0	\$77.70				
	19	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30				
		SUPP	ORT STAFF						
	20	Technical Support Staff	Eng Staff	0	\$50.37	3			
	21	Administrative Support Staff	CADY ADMIN	C	\$43.14				
	_	HALEY & ALURICH		RHEAD RATE	220.84%				
		TECHA	ICAL STAFF						
	1	Ed Zaminskie, PE	Lead Geolechnical Eng.	0	\$84.06				
	2	Project Engineer	Project Engineer		\$60.60				
1	3	Engineering Staff	Eng Staff	0	\$50.69				
	-	Junior Engineering Staff	Jr. Eng Staff		\$34,99				
	4			V	9-24.93				
F	4	Control Congeneering Control							
F	-	SUPP	ORT STAFF						
F	-	SUPP CADD/ Project Assistant	ORT STAFF	Q		5			
E	-	SUPP CADD/ Project Assistent GRIFFIN ENGINEERING	ORT STAFF	O RHEAD RATE	\$30.30 182,30%	\$			

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY		
1000		NAIK CONSULTING GR	OUP OV	RHEADRATE	127.09%			
	-	TE	CHNICAL STAFF					
	1	John Tan, PE	PM	8	\$90.56	\$724		
	2	Rich Baron	SURV PM	20	\$58,30	\$1,166		
	3	Project Surveyor	SURV Proj. Surv	40		\$1,900		
	4	Party Chief	SURV Inst. Tech.	0	\$37.21	\$Ó		
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0		
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0		
	7	Senior Ulity Engineer	UTIL Sen. Eng.	0	\$45.79	\$0		
	8	Utility Engineering Staff	UTIL Eng Staff	0		\$0		
	9	Senior Structural Engineer	STR Sen. Eng	0	\$54.50	\$0		
	10	Structural Engineering Staff	STR Eng Staff	Ó	\$29.22	\$0		
2		\$	UPPORT STAFF					
NAIK	11	CAD Manager	CAD Mor	4	\$58 19	\$233		
2	12	CAD Technicians	CAD Tech	60				
	ENVISION OVERHEAD RATE 137,51%							
		TE	CHNICAL STAFF					
12	1	Kurt Buettler	Doc. Ctrl. Mar	0	\$42.00	\$0		
~	2	Thomas Hartley	VE Team Lead	Ó	\$94.40			
δI	3	Configuration Management	Config. Mgmt.	0				
5	4	Value Engineering Team	VE Team	0				
ENVISION	-	SI	UPPORT STAFF					
бI	5	Administration	IAdmin	0	\$21.40	\$0		
	-	JCMS	OV	STRATES STRATE		40		
	-	TE	CHNICAL STAFF					
0	1	K. Meehan	Senior Est.	0	\$63.67	\$0		
3	2	Junior Estimator	Junion Est.	0		50		
JCMS	3	Project Controls	IPC	ő				
	10000	RADIN	07	READEATE				
11			CHINICAL STAFF					
z	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0		
δļ			UPPORT STAFF		1 0100.00			
RADIN	2	Beth Uczynski	ICAD N	Ó	\$38.21	\$0		
-	-	SJH						
	-		CHINICAL STAFF		, 40,00 /0			
	1	S Jayakumaran	Civil Eng VIII	0	\$84.24	\$0		
E.		Senior Engineering Staff	Sen. Eng Staff	0	\$59.58			
H'S	3	Engineering Staff	Eng. Staff	0		\$0 \$0		
43	4	Contraction and a	Lind' over	U	340.43	20		

TEAM SUMMARY			
TOTAL ESTIMATED HOURS	152		
Total Salary			\$6,466
Overhead			\$3,218
Subtotal			
Fixed Fee		10%	\$14,665 \$1,468
Total Direct Costs			50
TOTAL COST			\$15,153

11	1000		STIMATE BY INDIVIDUA						
	TASK:		and the second of the second	FIRM:					
U	4.1	5 Utility Relocation		H&H / GANNI	ETT FLEMING	JV			
	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR			
	+0-1	HARDESTY & HANOVER		SPHEROD PANE	157,48%	10			
	1.00		IICAL STAFF		-				
	1	Visha Szumanski, PE	PM, STR Eng VIII	Ó	\$95.85	\$			
	2	Charle Geer, PE	Risk Manager	0	\$98.01	\$			
	3	David Tuckman, PE	DPM, STR Eng VII	0	\$81.81	5			
	4	Steve Harlacker, PE SE	QAOC, STR Eng VI	0	\$72.32	5			
	5	Sleve Hom, PE	STR Eng Vil	0	\$80.39	\$			
1	6	Peter Roody, PE	STR Eng Vill	0	\$86.51	3			
	7	Michael Hawkins, PE	STR Eng Viti	0	\$105.14	\$			
	8	Sleve Mikucki, PE	MECH Eng VII	0	\$85.43	5			
	9	Alex Noble, PE	ELEC Eng VI	0	\$70.29	1			
U	10	Paul Connolly, PE	STR Eng VII	0	\$80.09				
	11	Gien Schetelich, PE	STR Eng VIII	0	\$109.79				
	12	Raymond Mankbadi, PE	STR Eng VIII	0	\$86.58				
UNACVER.	13	Mishac Yegian, PE, PhD	STR Eng Vill	0	\$78.13				
Ę	14	David Marcic, PE, SE	STR Eng VI	0	\$72.55	5			
5	15	Jerry DiMaggio PE	STR Eng Vili	Ö	\$78.13	5			
ā	15	David Gerber, PE	STR Eng VI	0	\$75.63				
	17	Draw DeleDonne, RA	STR Eng VI	õ	\$69.83	1			
I CONVER	-		ORT STAFF						
1	18	Support Staff	STRIV	0	\$40.04	\$			
	19	Support Staff	MECHIN	Ó	\$45.04	3			
ξÌ	20	Support Staff	ELEC I-V	0	\$46.04	5			
6	21	Support Staff	CADV ADMIN	0	\$37.23	\$			
	GANNETT FLEMING OVERHEAD RATE 198.17%								
	TECHNICAL STAFF								
	1	Richard Cross, PE	DPM	0	\$105.40	5			
	2	Cavit Howell, PE	Rail Sys. Lead	6	\$64,70	3			
	3	Bruce Smith	Quality Control	0	\$63.60	\$			
	- 4	Robert Matthews, PE	Civil Lead	0	\$79.20	\$			
	5	Steven Zapoliczny, PE	Sile/Chvi	0	\$43.70	\$			
	6	Agnieszäka Lapinski, PE	Sr. Sinuctural	0	\$72.00	\$			
	-7-	John Legath, PE	Track	D	\$64.10	1			
	8	Terry Sharitz, PE	Cat/ Trans	0	199.20	3			
	9	Bryan Shober, PE	Cat/ Trans	0	\$84,30	5			
	10	Greg Nazarow	Rail Ops		\$79.20				
	11			0	918 501	5			
		lan Martin	Rail Ops	0	\$76.60	1			
	12	lan Martin Neil Water				1			
	12		Rail Ops Comms Comms	0	\$76.60	5			
	12	Neil Water	Rel Ops Comms	000	\$76.60 \$73.70				
2	12 13 14 15	Neil Water James Sgro Theodore Bandy, PE Stephen Barkovich	Rail Ops Comms Comms	000	\$76.60 \$73.70 \$90.00				
	12 13 14 15 16	Nell Water James Sgro Theodore Banty, PE	Rel Ops Comms Comms Sys. Integ.	0000	\$78.60 \$73.70 \$90.00 \$100.00				
CHING .	12 13 14 15	Neil Water James Sgro Theodore Bandy, PE Stephen Barkovich	Ral Ops Comms Sys. mleg. Sys. mleg. Sys. mleg. Signats	0000	\$76.60 \$73.70 \$90.00 \$100.00 \$59.10	3			
	12 13 14 15 16	Neil Water James Sgro Theodore Bandy, PE Stephen Barkovich Richard Lentz	Rail Ops Comms Comms Sys. Integ. Sys. Integ.	0 0 0 0	\$76.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90				
	12 13 14 15 16 17	Hell Water James Sgro Theodore Banty, PE Stephen Bankovich Richard Lentz Joseph Bonaduce Joseph Bonaduce Joseph Bonaduce	Rail Ops Comms Comms Syst. Inleg. Syst. Inleg. Signals Signals Signals Safety & Sec.	0 0 0 0 0	\$76.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90 \$100.70 \$99.60	5 5 5 5 5 5 5 5 5			
	12 13 14 15 16 17 18	Neil Water James Sgro Theodore Bandy, PE Stephen Barkovich Richard Lentz Jaseph Bonaduce	Rail Ops Comms Comms Syst. Inleg. Syst. Inleg. Signals Signals Signals Safety & Sec.	0 0 0 0 0	\$76.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90 \$100.70	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 16 17 18 18	Neif Water James Egro Theodore Bandy, PE Blephen Barkovich Filchard Lentz Jeseph Bonaduce Alarsz Edraki, PE, PMP McEwan van der Mandele, CPP Ramesin Rajagopal, PE	Rail Ops Comms Comms Sys. Integ. Sys. Integ. Synats Signats Signats Signats Signats Signats Signats Safety & Sec. Safety & Sec.	0 0 0 0 0 0 0 0 0 0 0	\$78.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90 \$100.70 \$100.70 \$309.80 \$77.70	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 16 17 18 18	Neif Water Lames Sgro Theodore Bandy, PE Stephen Barkovich Richard Lentz Joseph Bonaduce Alarsz Edrak, PE PAIDER Van der Mandele. CPP Ramesin Raargopal, PE SUPP	Rail Ops Comms Comms Sys. Integ. Sys. Integ. Signals Signals Sathty & Sec. Sathty & Sec. Sathty & Sec. Sathty & Sec. Hydrology OKT STAFF	0 0 0 0 0 0 0 0 0 0 0	\$78.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90 \$100.70 \$100.70 \$309.80 \$77.70	3 3 3 3 3 3 3 3 3 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 16 17 18 18 18	Neif Water Lames Sgro Theodore Bandy, PE Stephen Barkovich Richard Lentz Joseph Bonaduce Alarsz Edrak, PE PAIDER Van der Mandele. CPP Ramesin Raargopal, PE SUPP	Rail Ops Comms Comms Sys. Integ. Sys. Integ. Synats Signats Signats Signats Signats Signats Safety & Sec. Safety & Sec. Hydraulics & Hydrology	0 0 0 0 0 0 0 0 0	\$78.60 \$73.70 \$90.00 \$100.00 \$59.10 \$81.90 \$100.70 \$38.60 \$77.70 \$77.30	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 16 17 18 18 19 20	Neif Water Lames Sgro Theodore Bandy, PE Stephen Barkovich Richard Lentz Joseph Bonaduce Alarsz Edrak, PE PAIDER Van der Mandele. CPP Ramesin Raargopal, PE SUPP	Rail Ops Comms Comms Sys. Inleg. Sys. Inleg. Sysulfs Signals Signals Signals Signals Signals Signals Signals Signals Satety & Sec. Hydroulics & Hydrology ORT STAFF Eng. Staff CADY ADMIN	0 0 0 0 0 0 0 0 0 0 0 0 0	\$76 60 \$73,70 \$90,00 \$100,00 \$59,10 \$81,90 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,70 \$100,000 \$100,0000\$100,0000\$100,0000\$100,0000\$100,0000\$100,0000\$100,0000\$100,0000\$100,0000\$100,0000\$100000\$100000\$100000\$100000\$1000000	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 16 17 18 18 19 20	Neil Water James Egro Theodore Bandy, PE Stephen Barkovich Alchard Lentz Joseph Bonaduce Almaza Ednaki, PE, PMP McEwan van der Mandele, CPP Ramesin Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH	Rail Ops Comms Comms Sys. Integ. Sys. Integ. Signats S		\$76.60 \$75.70 \$90.00 \$100.00 \$81.90 \$100.70 \$81.90 \$100.70 \$89.60 \$77.70 \$73.30 \$50.37	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 16 17 18 18 19 20	Neil Water James Egro Theodore Bandy, PE Stephen Barkovich Alchard Lentz Joseph Bonaduce Almaza Ednaki, PE, PMP McEwan van der Mandele, CPP Ramesin Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH	Rail Ops Commis Commis Sys. Integ. Sys. Integ. Sys. Integ. Signats Signats Safety & Sec. Safety & Sec. Hydmulics & Hydrology ORT \$TAFF Eng. Staff CAD: ADMIN CAD: ADMIN CAD: ADMIN		\$76.60 \$73.70 \$90.00 \$100.00 \$91.00 \$100.70 \$100.70 \$100.70 \$77.70 \$77.30 \$50.37 \$43.14 \$20,\$45	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 16 17 18 18 19 20	Neif Water James Egro Theodore Bandy, PE Stephen Barkovich Richard Leniz Joseph Bonaduce Ainsta Edraki, PE, PHP McEwan van der Mandele, CPP Ramesin Raagopal, PE SUPP Technical Support Staff HALEY & ALDRICH TECHN Ed Zaminskin, PE	Rail Ops Comms Comms Sys. Inleg. Sys. Inleg. Sysulfs Signafs S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$76.60 \$73.70 \$90.00 \$100.00 \$91.90 \$100.70 \$98.60 \$77.70 \$73.36 \$50.37 \$50.37 \$43.14 \$20,54%	3 3 3 3 3 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 36 17 18 18 18 19 20 21 21	Neil Water James Egro Theodore Bandy, PE Baphen Barkovich Alchard Lentz Joseph Bonaduce Almaza Ednaki, PE, PMP MeEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH TECHN Ed Zaminskin, PE Propiet Engineer	Rail Ops Comms Comms Sys. Integ. Sys. Integ. Sys. Integ. Sys. Integ. Sys. Sys. Sys. Sys. Sys. Sec. Safety & Sec. S	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$78.60 \$73.70 \$80.00 \$59.10 \$81.90 \$100.70 \$84.90 \$77.70 \$73.35 \$77.70 \$73.35 \$77.70 \$73.35 \$73.43.14 \$43.14 \$40.65 \$60.65	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 36 17 18 18 18 19 20 21	Neif Water James Egro Theodore Bandy, PE Stephen Barkovich Richard Lenz Jaweyh Bonaduce Jaweyh Bonaduce James Bonaduce James Bonaduce James Raargopal, PE Support Staff Administrative Support Staff HALEY & ALLPROCH TECHN Ed Zammakin, PE Project Engineering Staff	Rail Ops Commis Commis Sys. Integ. Sys. Integ. Sys. Integ. Synats Signats Safety & Sec. Safety & Sec. Safety & Sec. Safety & Sec. Hydinulics & Hydrology ORT \$TAFF Eng. Staff CAD: ADMIN CAD: ADMIN CAD: ADMIN CAD: ADMIN CAD: ADMIN CAD: ADMIN CAD: ADMIN CAD: STAFF Law Gentechnical Eng. Project Engs Staff	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	376.60 \$73.70 \$90.00 \$100.00 \$39.10 \$100.00 \$100.70 \$100.70 \$70.30 \$77.70 \$73.30 \$50.37 \$43.14 \$20,54% \$54.08 \$40.60 \$55.68				
	12 13 14 15 16 17 18 18 19 20 21 21 1 2 20 21	Neif Water James Egro Theodore Bandy, PE Stephen Barkovich Richard Leniz Joseph Bonaduce Ainsta Edraki, PE, PH/P McEwan van der Mandele, CPP Ramesin Rajagopal, PE SUPP Technical Support Staff HALEY & ALDRICH TECHN Ed Zaminskip, PE Project Engineering Staff	Rail Ops Comms Comms Sys. Inleg. Sys. Inleg. Sys. Inleg. Signals Signa	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$78.60 \$73.70 \$80.00 \$59.10 \$81.90 \$100.70 \$84.90 \$77.70 \$73.35 \$77.70 \$73.35 \$77.70 \$73.35 \$73.43.14 \$43.14 \$40.65 \$60.65	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
	12 13 14 15 36 17 18 19 20 21 21 1 2 3 4	Neil Water James Egro Theodore Bandy, PE Stephen Barkovich Alchard Lentz Joseph Bonaduce Almaza Ednaki, PE, PMP McEwan van der Mandele, CPP Ramesh Rajagopal, PE SUPP Technical Support Staff Administrative Support Staff MALEY & ALLINGLET TECHN Ed Zaminskin, PE Propied Engineering Staff Jamice Engineering Staff Jamice Engineering Staff	Rail Ops Comms Comms Sys. Integ. Sys. Integ. Sys. Integ. Synats Signat	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$70.60 \$73.70 \$90.00 \$100.00 \$39.10 \$100.70 \$100.70 \$397.80 \$77.70 \$75.36 \$50.37 \$43.14 \$205.84% \$40.66 \$50.69 \$304.69 \$304.69	3 3 3 3 4 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 4 3 3 3 4 4 3 3 5 4 4 4 3 5 5 4 5 5 5 5			
	12 13 14 15 16 17 18 18 19 20 21 21 1 2 20 21	Neil Water James Egro Theodore Bandy, PE Stephen Barkovich Richard Lentz Joseph Bonaduce Alarsa Edraki, PE PAIP McEwan van der Mandele. CPP Ramesin Raagopal, PE SUP Technical Support Staff Administrative Support Staff Administrative Support Staff Administrative Support Staff Administrative Support Staff Administrative Support Staff Administrative Support Staff CADO/ Propert Assertant	Rail Ops Commis Commis Sys. Integ. Sys. Integ. Sys. Integ. Synats Safety & Sec. Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT \$TAFF Eng. Slaff CAD: ADMIN WICAL STAFF Lasd Centechnical Eng. Project Engineer Eng. Slaff Jr. Eng Slaff ORT \$TAFF CAD: ADMIN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	376.60 \$73.70 \$80.00 \$100.00 \$39.10 \$100.70 \$100.70 \$100.70 \$73.30 \$50.37 \$43.14 \$43.14 \$20,545 \$40.60 \$50.69 \$350.69 \$350.69 \$354.99	3 3 3 3 4 4 3 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 3 3 4 4 3 3 3 4 4 3 3 5 4 4 4 3 5 5 4 5 5 5 5			
	12 13 14 15 36 17 18 19 20 21 21 1 2 3 4	Neil Water James Egro Theodore Bandy, PE Stephen Barkovich Richard Leniz Joseph Bonaduce Almaza Edraki, PE PMP McEwan van der Mandele, CPP Ramesin Rajagopal, PE SUPP Technical Support Staff HALEY 3: ALDRICH TECHN Ed Zaminskier, PE Project Engineering Staff Jamice Engineering Staff SUPP (CADD) Project Assetant SUPP	Rail Ops Commis Commis Sys. Integ. Sys. Integ. Sys. Integ. Synats Safety & Sec. Safety & Sec. Safety & Sec. Hydraulics & Hydrology ORT \$TAFF Eng. Slaff CAD: ADMIN WICAL STAFF Lasd Centechnical Eng. Project Engineer Eng. Slaff Jr. Eng Slaff ORT \$TAFF CAD: ADMIN	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$70.60 \$73.70 \$90.00 \$100.00 \$39.10 \$100.70 \$100.70 \$397.80 \$77.70 \$75.36 \$50.37 \$43.14 \$205.84% \$40.66 \$50.69 \$304.69 \$304.69	8 8 8 9 8 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8			

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY		
		NAIK CONSULTING GR	90 900	RHEAD RATE	127,09%			
	1.00	TE	CHNICAL STAFF					
	1	John Tan, PE	PM	48.	\$90.56	\$4,347		
	2	Rich Baron	SURV PM	0	\$58,30	\$0		
	3	Project Surveyor	SURV Proj. Surv.	Ö	\$47.50	50		
	4	Party Chief	SURV Inst. Tech.	0	\$37.21	\$0		
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0		
	6	Ron Rotunno, PE	UTIL Mgr	100	\$74.66	\$7,466		
	7	Senior Ulity Engineer	UTIL Sen. Eng.	220	\$45.79	\$10.074		
	. 6	Utility Engineering Staff	UTIL Eng Staff	640	\$37 79	\$24,186		
	9	Senior Structural Engineer	STR Sen. Eng.	0	\$54.50	50		
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0		
4		ઠા	IPPORT STAFF					
NAIK		CAD Manager	CAD Mgr	20	\$58,19	\$1,164		
Ž.	12	CAD Technicians	CAD Tech	720 RHEAD RATE	\$30.54	\$21,989		
		ENVISION	137.51%					
			CHNICAL STAFF					
	1	Kurt Buetter	Ooc. Ctrl. Mgr	0	\$42.00	\$0		
z	2	Thomas Hartley	VE Team Lead	0	\$94.40	\$0 \$0		
12	3	Configuration Management	Config. Mgmt.	0	\$55.00	\$0		
ENVISION	4	Value Engineering Team	VE Team	0	\$75.52	\$0		
IZ I	SUPPORT STAFF							
W	5	Administration	Admin	0	\$21.40	\$0		
		JCMS		RHEAD RATE	117.32%			
10	-		CHINICAL STAFF					
JCMS		K. Meehan	Senior Est.	0	\$63.67	\$0		
181	2	Junior Estimator	Junion Est.	0	\$46.20	\$0		
Ĕ	3	Project Controls	PC	Ó	\$57 75	\$0		
100		RADIN		RICEAD RATE	165.17%			
	_		CHNICAL STAFF					
I≶ I	1	Chitra Radin	Disc. Lead	Û	\$100.00	\$0		
RADIN			IPPORT STAFF					
R.	2	Beth Uczynski	CADIN	0	\$38.21	\$0		
	_	SJH		GUNEAU RATE	140.00%			
	_		CHNICAL STAFF					
	1	S. Jayakumaren	Civil Eng VIII	0	\$84.24	\$0		
E	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	50		
لەت	3	Engineering Staff	Eng. Staff	0	\$40.43	\$0		

TEAM SUMMARY			
TOTAL ESTIMATED HOURS	1,748	-	_
Total Salary			\$69,225
Overhead			\$87,978
Subtotal			\$157,203
Fixed Fee		10%	\$15,720
Total Direct Costs			\$0
TOTAL COST			\$172,923

10			STIMATE BY INDIVIDUA							
	TASK:			FIRM.						
L	4.10	5 Geotech Investigation		HEH / GANNI	ETT FLEMING	JV				
	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALAR				
τ	1	HARDESTY & HANOVER		ERNEAD RATE	157.40%					
II.			NCAL STAFF							
1	1	Visha Szumanski, PE	PM. STR Eng VIII	0	\$96.86	1				
L	2	Charlie Geer, PE	Risk Manager	0	\$98.01	5				
L	3	David Tuckman, PE	DPM, STR Eng VII	0	\$81.61	3				
L	- 4	Steve Hartacker, PE_SE	GADC, STR Eng VI	0	\$72.32					
E	5	Steve Hum, PE	STR Eng VN	0	\$90.39					
E	6	Peter Roody, PE	STR Eng VIII	0	\$86.51	5				
L	7	Michael Hawkins, PE	STR Eng VII	0	\$108.14	5				
L	8	Steve Mikucki, PE	MECH Eng VII	0	\$86.43					
L	9	Arex Noble, PE	ELEC Eng VI	0	\$70.29					
E	10	Paul Connolly, PE	STR Eng VII	0	\$50.09	5				
E	11	Gien Schetelich, PE	STR Eng VIII	0	\$109.79					
E	12	Raymond Mankbadi, PE	STR Eng VIII	310	\$86 58	\$26.64				
	13	Mishac Yeglan, PE, PhD	STR Eng Vill	103	\$76.13	\$7,84				
ſ	14	David Marcic, PE, SE	STR Eng VI	0	\$72.55					
Ľ	- 15	Jerry DiMaggio PE	STR Eng VIII	0	\$78.13					
E	16	David Gerber, PE	STR Eng VI	D	\$75.63	3				
E	17	Drew DeleDonne, RA	STR Eng VI	0	\$89.63	3				
E	1.00		ORT STAFF		100 m 1 m 1					
E	- 18	Support Staff	STRIV	4,747	\$46.04	\$216,55				
E	19	Bupport Staff	MECHIN	0	\$48.04	1				
E	20	Support Staff	ELEC I-V	0	\$40,04	5				
I	21	Support Staff	CAD/ ADMIN	0	\$37.23					
Т	GANNETT FLEMING OVERREAD RATE 158.17%									
10	TECHNICAL STAFF									
E	1	Richard Cross, PE	(OPM	0	\$105.40	\$				
E	2	David Howell, PE	Reil Sys. Lead	ő	\$64.70					
Į	3	Bruce Smith	Quality Control	0	\$63,60					
ſ	4	Robert Matthews, PE	Civil Lead	- O	\$79.20	5				
Г	5	Steven Zapoticzny, PE	SHOCIMI	Ő	\$43,70	5				
Г	e	Agnieszkas Lepinski, PE	Sr. Structural	0	\$72.00	5				
T	7	John Legath, PE	Track	0	364.10	3				
E	8	Terry Sheriz, PE	Call Trans	0	\$59.20	3				
Г	9	Bryan Shober, PE	Cal/ Trans	0	184.30	3				
I.	tO	Greg Nazarow	Rail Ops	0	\$79.20	5				
P	11	Ian Martin	Rail Ops	0	\$75.50	1				
r	12	Net Water	Comms	0	\$73.70	-				
Ľ	13	James Sgro	Comms	0	\$90.00	5				
t	14	Theodora Bandy, PE	Sys Inleg	0	\$100.00	5				
h	15	Stephen Barkovich	Sys Integ	0	\$59.10	3				
1h	16	Richard Lentz	Signate	0	\$81.90					
	17	Joseph Bonaduce	Signals	0	\$100.70					
Ŀ	18	Alireza Edraki PE, PMP	Safety & Sec.	0	199.60					
k	18	McEwan van der Mandele, CPP	Safety & Sec.	0	\$77.70	5				
Ę			Hydraulica & Hydrology	0	\$73.30					
	19			- W	41.0.00					
	19	Ramesh Rajagopat. PE								
		SUPP	ORT STAFF		920 49					
	20	SUPP Technical Support Staff	ORT STAFF	0	\$50.37	- 1				
a a la a a a a a		SUPP Technical Support Staff Administrative Support Staff	ORT STAFF Eng Sleff CADY ADMIN	0	\$43,14					
a to the second s	20	SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH	ORT STAFF Eng Staff CAD' ADMIN							
a sector se	20	SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH TECHN	ORT STAFF Eng Slaff CAD/ADMIN OVI ICAL STAFF	0 ERHEAD RATE	\$43.14 220.54%	3				
to the second se	20 21	SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH TECHN [Ed Zaminshie, PE	ORT STAFF Eng Staff CAD/ ADMIN OW HCAL STAFF Land Geolechnical Eng.	0 ERHEAD RATE 238	\$43.14 220.94% \$54.06	\$20,00				
The second se	20 21 1 2	SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH TECHN TECHN TECHN TECHN TECHN	ORT STAFF Eing Staff CAD: ADMIN NCAL STAFF Land Geotebhical Eing. Project Engineer	0 ERHEAD RATE 238 330	\$43.14 220.54% \$54.06 \$50.60	\$20.00				
The second se	20 21 1 2 3	SUPP Technical Europort Staff Administrative Europort Staff HALLEY & ALDHICH TECHN TECHN TECHN TECHN TECHN TECHN TECHN TECHN TECHN	ORT STAFF Eng Staff CADI ADMIN MCAL STAFF Land Geolethnical Eng. Project Engineer Eng Staff	0 218 218 330 300	\$43.14 220.94% \$54.06 \$80.60 \$50.69	\$20,00 \$19,99 \$15,20				
	20 21 1 2	SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH TECHN Ed Zamerskie, PE Project Engineer Engineering Staff Junor Engineering Staff	ORT STAFF Ling Staff CADY ADMIN OVA CADY ADMIN OVA CAL STAFF Lend GooleChinical Eng. Project Engineer Eng Staff Jr. Eng Staff	0 ERHEAD RATE 238 330	\$43.14 220.54% \$54.06 \$50.60	\$20,00 \$19,99 \$15,20				
The second se	20 21 1 2 3	SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH TECHN Ed Zamenskie, PE Project Engineer Engineering Staff Junior Engineering Staff Junior Engineering Staff	ORT STAFF Ling Staff CAD ADMIN OPI ICAL STAFF Last Coolectioncal Ling. Project Engineer Ling Staff Jr. Eng Staff ORT STAFF	0 238 330 300 2,342	\$43.14 220.54% \$54.06 \$80.60 \$50.89 \$34.99	\$20,00 \$19,99 \$15,20 \$81,94				
	20 21 1 2 3	SUPP Technical Europort Staff Administrative Europort Staff HALEY & ALDRICH TECHN Ed Zamenskie, PE Project Engineeri Expensering Staff Juntor Engineering Staff Surror Engineering Staff SUPP (CADD/ Project Assistant	ORT STAFF Eing Staff CAD ADMIN HCAL STAFF Land Geolethnical Eng. Project Engineer Eing Staff Lr. Eng Staff ORT STAFF CADY ADMIN	0 238 330 2342 300 2342 310	\$43.14 220.54% \$64.06 \$60.60 \$50.69 \$34.99 \$34.99	\$20,00 \$19,99 \$15,20 \$81,94				
	20 21 1 2 3	SUPP Technical Support Staff Administrative Support Staff HALEY & ALDRICH TECH Ed Zamerskie, PE Project Engineerr Engineering Staff Jurior Engineering Staff SUPP [CADO: Project Assistant GRIFFHN EINGINEERANG	ORT STAFF Eing Staff CAD ADMIN HCAL STAFF Land Geolethnical Eng. Project Engineer Eing Staff Lr. Eng Staff ORT STAFF CADY ADMIN	0 238 330 300 2,342	\$43.14 220.54% \$54.06 \$80.60 \$50.89 \$34.99	\$20,00 \$19,99 \$15,20 \$81,94				

	NO,	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY		
		NAIK CONSULTING GR	906 04	ERILEAD RATE	127.09%			
		TE	CHINICAL STAFF					
	1	John Tan, PE	PM	0	\$90.56	\$0		
	2	Rich Baron	SURV PM	0	\$58.30	\$0		
	3	Project Surveyor	SURV Proj Surv	0	\$47.50			
	4	Party Chief	SURV Inst. Tech.	Ó	\$37.21	\$0 \$0		
	5	Instrument Technician	SURV Inst. Tech.	Ó	\$28.62	\$0		
1 1	6	Ron Rotunno_PE	UTIL Mor	0	\$74.66	\$0		
	7	Senior Ulity Engineer	UTIL Sen. Eng.	0	\$45.79	50		
	8	Utility Engineering Staff	UTIL Eng Staff	0	\$37.79	\$0		
	9	Senior Structural Engineer	STR Sen. Eng	0	\$54.50	50		
	10	Structural Engineering Staff	STR Eng Staff	0	\$29.22	\$0		
		SL	PPORT STAFF					
NAIK	11	CAD Manager	CAD Mar	0	\$58,19	\$0		
2	12	CAD Technicians	CAD Tech	0	\$30,54	\$0		
	ENVISION OVERHEAD RATE 137.51%							
	TECHNICAL STAFF							
		Kurt Buettler	Doc. Ctrt. Mgr	0	\$42.00	\$0		
z	2	Thomas Hartley	VE Team Lead	0	\$94.40	\$0		
0	3	Configuration Management	Config. Mgmt.	0	\$55.00	\$0		
5	4	Value Engineering Team	VE Team	0	\$75.52	\$0		
ENVISION			PPORT STAFF					
Ē	5	Administration	Admin	0	\$21.40	\$0		
		JCMS		RHEADRATE	117.32%			
			CHNICAL STAFF					
5		K. Meehan	Senior Est.	0	\$63.67	\$0		
JCMS	2	Junior Estimator	Junion Est.	0	\$46.20	\$0		
Y.	3	Project Controls	PC	0	\$57.75	\$0		
	-	RADIN		RHEAD RATE	155.17%			
			CHNICAL STAFF					
I S I	1	Chitra Radin	Disc. Lead	0	\$100.00	\$0		
RADIN			IPPORT STAFF					
2	2	Beth Uczynski	CADIN	0	\$38.21	50		
	-	SJH	ovi	RREADTRATE	140.00%			
		TEC	CHNICAL STAFF					
	1	S Jayakumaran	Civil Eng VIII	0	584.24	50		
HLS	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	50		
တ်	3	Engineering Staff	Eng Staff	0	\$40.43	\$0		

TEAM SUM	ARY		
TOTAL ESTIMATED HOURS	8,680		_
Total Salary			\$399.785
Overhead			\$722,389
Subtotal		-	\$1,122,165
Fixed Fee		10%	\$112,217
Total Direct Costs		-	\$2,260,025
TOTAL COST			\$3,494,407

	TASK:	E	STIMATE BY INDIVIDUA						
		As Directed		FIRM: H&H/GANN	ETT FLEMING	JV			
	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY			
7	15.000	HARDESTY & HANOVER	OV	ERHEADTRATE	157,40%				
		Visha Szumanski, PE	PM. STR Eng VIII						
	2	Charlie Geer, PE	Risk Manager	60		\$5.81			
		David Tuckman, PE	DPM, STR Eng VII			\$(
	4	Sleve Hanacker, PE, SE	QAQC, STR Eng VI	- 0					
	5	Steve Hom, PE	STR Eng VII	- ŏ					
	6	Peter Roody, PE	STR Eng VIII			SI SI			
	7	Michael Hawkins, PE	STR Eng VIII	0					
	6	Steve Mikucki, PE	MECH Eng Vil	0		S			
	9	Alex Noble, PE	ELEC Eng VI	0					
	10	Paul Connolly, PE	STR Eng VII	0					
	11	Glen Schelelich, PE	STR Eng Vili	0	\$109,79	\$0			
NUNUNER	12	Raymond Mankbadi. PE	STR Eng Vill	0	\$86.58	\$0			
2	13	Mishac Yegian, PE, PhD	STR Eng VIII	0		\$0			
ξį	14	David Marcic, PE, SE	STR Eng VI	0					
5	15	Jerry DiMaggio, PE	STR Eng VIII	0					
8	16 17	David Gerber, PE	STR Eng VI	0	\$75.63	\$0			
	<u> </u>		STR Eng VI	0	\$69.83	\$0			
TICEURS I	18	Support Staff	ORT STAFF						
1	19	Support Staff	MECHI-V	180	\$46.04	\$8,287			
2	20	Support Staff	ELECTV	180	\$46.04	\$8,287			
٤.	21	Support Staff	CADY ADMIN	180	\$46.04	\$8,287			
-		GANNET I FLEMING			158,17%	30			
	GANNETT FLEMING OVERHEAD RATE 158.17%								
	1	Richard Cross, PE	IDPM	60	\$105.40				
	2	David Howell, PE	Rail Sys. Lead		\$64.70	\$6.324			
	3	Bruce Smith	Quality Control	ő	\$63.80				
	4	Robert Matthews, PE	Civil Lead	0	\$79,20				
	5	Sleven Zapoticzny, PE	Ste/Civil		\$43,70				
	6	Agnieszkka Lapinski, PE	Sr. Structural	0	\$72.00				
	7	John Legath, PE	Track	0	\$64.10	\$0			
	8	Terry Shantz, PE	Cal/ Trans	0	\$99,20				
	9	Bryan Shober, PE	Cal/ Trans	0	\$84.30	\$0			
	10	Greg Nazarow	Rail Ops	D	\$79.20	\$0			
	_ 11	lan Martin	Rail Ops	0	\$76,60	\$0			
	12	Nel Water	Comma	0	\$73.70	\$0			
	13	James Sgro	Comms	0	\$90.00	\$0			
	14	Theodore Bandy, PE	Sys. Integ	0	\$100.00	\$0			
	15	Stephen Barkovich	Sys Integ	0	\$59.10	\$0			
	16	Richard Lentz	Signals	0	\$81.90	\$0			
Hi	17	Joseph Bonaduce	Signais	0	\$100.70	\$0			
	18	Alireza Edraki, PE, PMP	Salety & Sec.	0	\$99.60	\$0			
	18	McEwan van der Mandele, CPP	Safety & Sec.	0	\$77.70	\$0			
	19	Ramesh Rajagopal, PE	Hydraulics & Hydrology	0	\$73.30	\$0			
1	20		ORT STAFF						
		Technical Support Staff Administrative Support Staff	Eng. Staff CAD/ ADMIN	540	\$50.37 \$43.14	\$27,200			
		HALEY & ALDRICH		RHEAD RATE	220.34%	\$0			
L.			ICAL STAFF		220.34 78				
	1		Lead Geotechnical Eng.	0	\$84,06]				
	2	Project Engineer	Project Engineer	0	\$60.60	50			
	3	Engineering Staff	Eng Staff	0	\$50.691				
	4	Junior Engineering Staff	Jr Eng Staff		\$34,991	\$0			
	-		ORT STAFF		404.001	80			
	5	CADD/ Project Assistant	CAD/ ADMIN	0	\$30.30	30			
1		GRIFFIN ENGINEERING		RHEAD RATE	152.30%				
		TECHN	ICAL STAFF						

	NO.	PERSON NAME	PROJECT TITLE / DISCIPLINE	ESTIMATED HOURS	HOURLY RATE	TOTAL SALARY				
		NAIK CONSULTING GI	ROUP OV	ERHEAD RATE	127.09%					
	TECHNICAL STAFF									
	1	John Tan, PE	PM	30	\$90.56	\$2,717				
E	2	Rich Baron	SURV PM	0	\$58,30	\$0				
	3	Project Surveyor	SURV Proj. Surv.	0	\$47.50	\$0				
	4	Party Chief	SURV Inst. Tech.	0	\$37,21	\$0				
	5	Instrument Technician	SURV Inst. Tech.	0	\$28.62	\$0				
	6	Ron Rotunno, PE	UTIL Mgr	0	\$74.66	\$0				
	7	Senior Uility Engineer	UTIL Sen. Eng.	0	\$45,79	\$0				
	8	Utility Engineering Staff	UTIL Eng Staff	ō	\$37.79	\$0				
		Senior Structural Engineer	STR Sen. Eng.	- O	\$54.50	\$0				
- I I	10	Structural Engineering Staff	STR Eng Steff	270	\$29.22	\$7.889				
~[UPPORT STAFF							
MAIK	- 11	CAD Manager	CAD Mar	0	\$58,19	\$0				
<u>S</u> [12	CAD Technicians	CAD Tech	0	\$30.54	\$0				
	ENVISION OVERHEAD RATE 137.51%									
1	TECHNICAL STAFF									
10	1	Kurl Buettler	Doc. Ctrl. Mgr	0	\$42.00	\$0				
z[Thomas Hartley	VE Team Lead	0	\$94.40	\$0				
2[3	Configuration Management	Config. Mgmt.	0	\$55.00	\$0				
₽ [4	Value Engineering Team	VE Team	0	\$75.52	\$0				
ENVISION	SUPPORT STAFF									
		Administration	Admin) 0	\$21.40	\$0				
	_	JCMS	OVE	RHEAD RATE	117,32%					
- 0		TECHNICAL STAFF								
≌[1	K. Meehan	Senior Est.	0	\$63.67	\$0				
SHOL	2	Junior Estimator	Junion Est.	0	\$46.20	50				
ň.		Project Controls	PC	0	\$57.75	\$0				
		RADIN		RHEAD RATE	155,17%					
<u>_ E</u>	-		CAL STAFF							
≨Ľ	1	Chtra Radin	Orsc. Lead	0	\$100.00	\$0				
RADIN	-		ORT STAFF							
62		Beth Uczynski	CADIV	0	\$38.21	\$0				
	-	SJH		RHEAD RATE	140.00%					
			CAL STAFF							
		S. Jayakumaran	Civil Eng VIII	0	\$84.24	\$0				
픬	2	Senior Engineering Staff	Sen. Eng Staff	0	\$59.58	\$0				
ທີ	3	Engineering Staff	Eng Statt	0	\$40.43	\$0				

TEAM SUMM	ARY		
TOTAL ESTIMATED HOURS	1,500	-	
Total Salary			\$74.804
Overhead			\$115,119
Subtotal			\$189,92
Fixed Fee		10%	\$18,993
Total Direct Costs			54
TOTAL COST			\$208,91

NJ TRANSIT RFP No. 15-044

Design, Engineering and Construction Assistance Services for the Replacement of Raritan River Bridge

DIRECT EXPENSES DETAIL

DIRECT EXPENSES SUMMARY BY TASK							
FIRM: Hardesty & Hanover/ Gannett Fleming JV	Total Cost						
TASK 1: Project Management							
REPRODUCTION	\$24,243.00						
TRAVEL	\$18,240.00						
SURVEY & TESTING							
MISCELLANEOUS	\$5,380.00						
TOTAL DIRECT EXPENSES	\$47,863.00						
TASK 2: Risk Management							
REPRODUCTION							
TRAVEL	\$4,360.00						
SURVEY & TESTING							
MISCELLANEOUS							
TOTAL DIRECT EXPENSES	\$4,360.00						
TASK 4.2: Survey & Base Mapping							
REPRODUCTION							
TRAVEL	\$3,520.00						
SURVEY & TESTING	\$188,200.00						
MISCELLANEOUS							
TOTAL DIRECT EXPENSES	\$191,720.00						
TASK 4.9: Feasibility Report							
REPRODUCTION							
TRAVEL	\$863.50						
SURVEY & TESTING							
MISCELLANEOUS							
TOTAL DIRECT EXPENSES	\$863.50						
TASK 4.10: Value Engineering							
REPRODUCTION							
TRAVEL	\$16,520.00						
SURVEY & TESTING							
MISCELLANEOUS							
TOTAL DIRECT EXPENSES	\$16,520.00						
TASK 4.12: Preliminary Design							
REPRODUCTION							
TRAVEL	\$970.50						
SURVEY & TESTING							
MISCELLANEOUS							
TOTAL DIRECT EXPENSES	\$970.50						
TASK 4.16: Detailed Geotechnical Investigation							
REPRODUCTION							
TRAVEL	\$43,725.00						
SURVEY & TESTING	\$2,216,300.00						
MISCELLANEOUS							
TOTAL DIRECT EXPENSES	\$2,260,025.00						
TOTAL DIRECT EXPENSES	\$2,522,322.00						

DIRECT EXPENSES SUMMARY BY FIRM						
FIRM: Hardesty & Hanover/ Gannett Fleming JV	Total Cost					
H&H/GF Joined Venture	a lot of the second					
REPRODUCTION	\$24,243.00					
TRAVEL	\$37,164.00					
SURVEY & TESTING	\$2,216,300.00					
MISCELLANEOUS	\$1,680.00					
TOTAL DIRECT EXPENSES	\$2,279,387.00					
Haley & Aldrich						
REPRODUCTION						
TRAVEL	\$30,995.00					
SURVEY & TESTING						
MISCELLANEOUS	\$760.00					
TOTAL DIRECT EXPENSES	\$31,755.00					
Griffin Engineering						
REPRODUCTION						
TRAVEL						
SURVEY & TESTING						
MISCELLANEOUS	\$220.00					
TOTAL DIRECT EXPENSES	\$220.00					
Naik Consulting Group						
REPRODUCTION						
TRAVEL	\$3,520.00					
SURVEY & TESTING	\$188,200.00					
MISCELLANEOUS	\$760.00					
TOTAL DIRECT EXPENSES	\$192,480.00					
Envision						
REPRODUCTION						
TRAVEL	\$16,520.00					
SURVEY & TESTING						
MISCELLANEOUS	\$760.00					
TOTAL DIRECT EXPENSES	\$17,280.00					
JCMS						
REPRODUCTION						
TRAVEL						
SURVEY & TESTING						
MISCELLANEOUS	\$760.00					
TOTAL DIRECT EXPENSES	\$760.00					
Radin						
REPRODUCTION						
TRAVEL						
SURVEY & TESTING						
MISCELLANEOUS	\$220.00					
TOTAL DIRECT EXPENSES	\$220.00					
BJH						
REPRODUCTION						
TRAVEL						
SURVEY & TESTING						
MISCELLANEOUS	\$220.00					
TOTAL DIRECT EXPENSES	\$220.00					
TEAM TOTAL	\$2,522,322.00					

	_	EAPENS	ES DETAIL -	HEITIGBOO				
FIRM: Hardesty & Hanover/ Ganne	tt Flem	ing JV						
TASK 1: Project Management								
Books - 8 ½ x 11 (*)	No.	Pages	Coples (*)	Total Sheets	Cost (B/W)	Cost (Color)	Binding	Total
Project Management Plan - Draft	1						\$4.00	\$138
Project Management Plan - Final	1	150	12	1,800			\$4.00	\$138
Quality Management Plan	1	150	12	1,800	\$0.05		\$4.00	\$138
Design Control Plan	1	100	12	1,200	\$0.05		\$4.00	\$108
Configuration Management Plan	1	100	12	1,200	\$0.05		\$4.00	\$108.
Design Management Plan	1	100	12	1,200	\$0.05		\$4.00	\$108.
Interface & Integration Mgmt Plan	1	150	12	1,800	\$0.05		\$4.00	\$138
TOTAL PRINTING			84	10,800				\$876.
DELIVERY (\$200 per trip, 4 trips)	4							\$800.
Notes:		10	DTAL COST					\$1,676.
(*) Distribution - Team (8 books) + Clien (4 b	ooke)							
	OOKS)							
TASK 2: Risk Management	-							
Books - 8 ½ x 11 (*)	No	Pages	Copies (*)	Total Sheets	Cost (B/W)	Cost (Color)	Binding	Total
Risk Management Plan - Draft	1	100	12	1,200	\$0.05		\$4.00	\$108.
Risk Management Plan - Final	1	100	12	1,200	\$0.05		\$4.00	\$108.
TOTAL PRINTING				2,400				\$216.
DELIVERY (\$200 per trip)	1							\$200.
		TC	TAL COST					\$416.
Notes:	• - •							
(*) Distribution - Team (4 books) + Clien (8 b	ooks)							
TASK 3: Systems Safety & Managemen	nt				-			_
Books - 8 1/2 x 11 (*)	No	Pages	Copies (*)	Total Sheets	Cost (B/W)	Cost (Color)	Binding	Total
Systems Safety & Mgmt - Draft	1	100	12	1,200	\$0.05		\$4.00	\$108.0
		400	40				\$4.00	\$108.0
Systems Safety & Mgmt - Final	1	100	12	1,200	\$0.05		34.00	\$100.U
TOTAL PRINTING	1	100	12	2,400	\$0.05		34.00	
	1				\$0.05		34.00	\$216.0
TOTAL PRINTING DELIVERY (\$200 per trip)	1		DTAL COST		\$0.05		34.00	\$216.0 \$200.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 br FASK 4.5: Concept Geotechnical Repo	1 poks)				\$0.05		34.00	\$216. \$200.
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: TO Distribution - Team (4 books) + Clien (8 bin TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*)	1 poks)		TAL COST		S0.05 Cost (B/W)	Cost (Color)	Binding	\$216.0 \$200.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes; (*) Distribution - Team (4 books) + Clien (8 b TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report	1 poks)	то	TAL COST	2,400		Cost (Color)		\$216. \$200. \$416.0 Total
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (4 books) + Clien (8 bi TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING	nt No.	TC	Copies (*)	2,400 Total Sheets	Cost (B/W)	Cost (Color)	Binding	\$216.0 \$200.0 \$416.0 Total \$78.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (4 books) + Clien (8 bi TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report	1 poks) rt No.	Pages 50	Copies (*) 12	2,400 Total Sheets 600	Cost (B/W)	Cost (Color)	Binding	\$216.0 \$200.0 \$416.0 Total \$78.0 \$78.0 \$78.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (4 books) + Clien (8 bi TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip)	nt No.	Pages 50	Copies (*)	2,400 Total Sheets 600	Cost (B/W)	Cost (Color)	Binding	\$216.0 \$200.0 \$416.0 Total \$78.0 \$78.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 br TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes:	nt No. 1	Pages 50	Copies (*) 12	2,400 Total Sheets 600	Cost (B/W)	Cost (Color)	Binding	\$216.0 \$200.0 \$416.0 Total \$78.0 \$78.0 \$78.0 \$209.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 br TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes:	nt No. 1	Pages 50	Copies (*) 12	2,400 Total Sheets 600	Cost (B/W)	Cost (Color)	Binding	\$216.(\$200.(\$416.(Total \$78.(\$78.(\$78.0 \$200.(
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 bo TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (6 books) + Clien (6 bo	nt No. 1	Pages 50	Copies (*) 12	2,400 Total Sheets 600	Cost (B/W)	Cost (Color)	Binding	\$216.(\$200.(\$416.(Total \$78.(\$78.(\$78.0 \$200.(
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 bo TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (6 books) + Clien (6 bo TASK 4.7: Navigational Study	nt No. 1	Pages 50	Copies (*) 12 TAL COST	2,400 Total Sheets 600	Cost (B/W)	Cost (Color)	Binding	\$216.0 \$200.0 \$416.0 Total \$78.0 \$78.0 \$78.0 \$209.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (4 books) + Clien (8 bo TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (6 books) + Clien (6 bo TASK 4.7: Navigational Study Books - 8 ½ x 11 (*) Navigational Study - Draft	nt No. 1 Doks) Pages 1	Pages 50 TO Pages 50	Copies (*) 12 TAL COST Copies (*) 12	2,400 Total Sheets 600 600	Cost (B/W) \$0.05		Einding \$4.00	\$216.0 \$200.0 \$416.0 Total \$78.0 \$78.0 \$200.0 \$278.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (4 books) + Clien (8 bo TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (6 books) + Clien (6 bo TASK 4.7: Navigational Study Books - 8 ½ x 11 (*) Navigational Study - Draft Navigational Study - Final	nt No. 1 No. 1 Pages	Pages 50 TO Pages	Copies (*) 12 TAL COST	Z,400 Total Sheets 600 600	Cost (B/W) \$0.05		Binding \$4.00	\$216.0 \$200.0 \$416.0 Total \$78.0 \$78.0 \$200.0 \$278.0 \$278.0
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 br TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (6 books) + Clien (6 br TASK 4.7: Navigational Study Books - 8 ½ x 11 (*) Navigational Study - Draft Navigational Study - Final TOTAL PRINTING	Pages 1 1	Pages 50 TO Pages 50	Copies (*) 12 TAL COST Copies (*) 12	Z,400 Total Sheets 600 600 Total Sheets 600	Cost (B/W) \$0.05	Cost (Color)	Binding \$4.00	\$216.0 \$200.0 \$416.0 Total \$78.0 \$200.0 \$278.0 \$200.0 \$278.0 \$278.0 \$200.0 \$278.0 \$200.0 \$278.0 \$200.0 \$278.0 \$200.0 \$278.0 \$200.0 \$278.0 \$200
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (4 books) + Clien (8 bo TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (6 books) + Clien (6 bo TASK 4.7: Navigational Study Books - 8 ½ x 11 (*) Navigational Study - Draft Navigational Study - Final	nt No. 1 Doks) Pages 1	Pages 50 TO Pages 50 50	Copies (*) 12 TAL COST Copies (*) 12 12	Z,400 Total Sheets 600 600 Total Sheets 600 600	Cost (B/W) \$0.05	Cost (Color)	Binding \$4.00	\$216.0 \$200.0 \$416.0 Total \$78.0 \$200.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$278.0 \$200.0 \$278.0 \$200.0 \$278.0 \$200.0 \$200.0 \$278.0 \$200.0 \$200.0 \$278.0 \$200
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 br TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (6 books) + Clien (6 br TASK 4.7: Navigational Study Books - 8 ½ x 11 (*) Navigational Study - Draft Navigational Study - Draft Navigational Study - Final TOTAL PRINTING DELIVERY (\$200 per trip)	Pages 1 1	Pages 50 TO Pages 50 50	Copies (*) 12 TAL COST Copies (*) 12	Z,400 Total Sheets 600 600 Total Sheets 600 600	Cost (B/W) \$0.05	Cost (Color)	Binding \$4.00	\$216.(\$200.(\$416.) Total \$78.(\$200.(\$278.(\$278.(\$278.(\$278.(\$278.(\$278.(\$278.(\$278.(\$278.(\$200.(\$278.(\$200.(\$278.())))))))))))))))))))))))))))))))))))
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TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 bo TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (6 books) + Clien (6 bo TASK 4.7: Navigational Study Books - 8 ½ x 11 (*) Navigational Study - Draft Navigational Study - Final TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (6 books) + Clien (6 bo	Pages 1 Pages 1 1	Pages 50 TO Pages 50 50	Copies (*) 12 TAL COST Copies (*) 12 12	Z,400 Total Sheets 600 600 Total Sheets 600 600	Cost (B/W) \$0.05	Cost (Color)	Binding \$4.00	\$216. \$200. \$416. Total \$78. \$200. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$278. \$200. \$278. \$200. \$278. \$200. \$278. \$200. \$278. \$200. \$278. \$200. \$278. \$200. \$278. \$200. \$278. \$278. \$200. \$278. \$200. \$278. \$278. \$278. \$278. \$278. \$200. \$278. \$278. \$278. \$200. \$278. \$278. \$278. \$200. \$278. \$278. \$278. \$200. \$278. \$278. \$200. \$200. \$278. \$200. \$200. \$278. \$200. \$200. \$278. \$200. \$20
TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (4 books) + Clien (8 bo TASK 4.5: Concept Geotechnical Repo Books - 8 ½ x 11 (*) Concept Geotech Report TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (6 books) + Clien (6 bo TASK 4.7: Navigational Study Books - 8 ½ x 11 (*) Navigational Study - Draft Navigational Study - Final TOTAL PRINTING DELIVERY (\$200 per trip) Notes: *) Distribution - Team (6 books) + Clien (6 bo TASK 4.9: Feasibility Report	Pages 1 Pages 1 1	Pages 50 TO Pages 50 50	Copies (*) 12 TAL COST Copies (*) 12 12 TAL COST	Z,400 Total Sheets 600 600 Total Sheets 600 600	Cost (B/W) \$0.05 Cost (B/W) \$0.05	Cost (Color)	Binding \$4.00	\$216.(\$200.(\$416.) Total \$78.(\$200.(\$278.(\$278.(\$278.(\$278.(\$278.(\$278.(\$278.(\$278.(\$278.(\$200.(\$278.(\$200.(\$278.())))))))))))))))))))))))))))))))))))
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(**) 8 disciplines, 5 drawings per discipline = total 40 dwgs, 2 submissions

		EXPENSI	ES DETAIL -	REPRODUC	TION			
FIRM: Hardesty & Hanover/ Gannet	t Flemi	ing JV						
TASK 4.10: VE Report								
Books - 8 ½ x 11 (*)	No	Pages	Copies (*)	Total Sheets	Cost (B/W)	Cost (Color)	Binding	Total
VE Report - Draft	1	150	18				\$4.00	\$207.
VE Report - Final	1	150	18				\$4.00	\$207.
TOTAL PRINTING				2,700				\$414.
DELIVERY (\$71.5 per trip)	2							\$143.
		TC	TAL COST					\$557.
<u>Notes:</u> (*) Distribution - Team (8 books) + Clien (10 b	ooks)							
TASK 4.12: Preliminary Design	-							
Books - 8 ½ x 11 (*)	No	Pages	Coples (*)	Total Sheets	Cost (B/W)	Cost (Color)	Binding	Total
Project Definition Report - Draft	1	200	20				\$4.00	\$280.
Project Definition Report - Final	1	200	20	and the second se		\$0,50	\$4.00	\$2,080.
Specifications	2	200	20		\$0.05		\$4.00	\$360.
Cost Estimate	2	150	20	3,000	\$0.05		\$4.00	\$310.
Calculations	2	700	20	14,000	\$0.05		\$4.00	\$860.
TOTAL				4,000				\$3,890.
Drawings (*)	No	Sheets (**)		Total Sheets	Cost (B/W)	Cost (Color)	Binding	Total
Full Size	2	240	20		\$0.50		\$0.50	\$4,820.
Half Size - 11 x 17	2	240	20	9,600	\$0.10		\$4.00	\$1,120.
TOTAL DOINTING		-		9,600				\$5,940.
DELIVERY (\$500 per trip)								\$9,830.
DELIVERT (3500 per uip)	2		TAL COST					\$1,000.
Notes:			TAL COST					\$10,830.0
		dwgs, 2 submis E Report)	sions					
Books - 8 ½ x 11 (*)	No.	E Report) Pages	Copies (*)	Total Sheets	Cost (B/W)	Cost (Color)	Binding	Total
Books - 8 ½ x 11 (*) PAECE Report - Draft	No 1	E Report) Pages 100	Coples (*) 14	1,400	Cost (B/W) \$0.05		\$4.00	\$126.0
Books - 8 ½ x 11 (*)	No.	E Report) Pages	Copies (*)	1,400 1,400		Cost (Color) \$0.50		\$126.0 \$756.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL	No 1	E Report) Pages 100	Copies (*) 14 14	1,400	\$0.05	\$0.50	\$4.00 \$4.00	\$126.0 \$756.0 \$882.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL	No. 1	E Report) Pages 100 100	Copies (*) 14 14	1,400 1,400 1,400			\$4.00 \$4.00 Binding	\$126.0 \$756.0 \$882.0 Total
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*)	No No 1 No	E Report) Pages 100 100 Sheets (**)	Copies (*) 14 14 Copies (*)	1,400 1,400 1,400 Total Sheets	\$0.05 Cost (B/W)	\$0.50	\$4.00 \$4.00	\$126.0 \$756.0 \$882.0 Total \$294.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL	No 1 No 2	E Report) Pages 100 100 Shects (**) 20	Copies (*) 14 14 Copies (*) 14	1,400 1,400 1,400 1,400 Total Sheets 560	\$0.05 Cost (B/W) \$0.50	\$0.50	\$4.00 \$4.00 Binding \$0.50	\$126.0 \$756.0 \$882.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL TOTAL PRINTING	Image: PAEC No 1 No 2 2	E Report) Pages 100 100 Shects (**) 20	Copies (*) 14 14 Copies (*) 14	1,400 1,400 1,400 Total Sheets 560 560	\$0.05 Cost (B/W) \$0.50	\$0.50	\$4.00 \$4.00 Binding \$0.50	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL	No 1 No 2	E Report) Pages 100 100 Sheets (**) 20 20	Copies (*) 14 14 14 Copies (*) 14 14	1,400 1,400 1,400 Total Sheets 560 560	\$0.05 Cost (B/W) \$0.50	\$0.50	\$4.00 \$4.00 Binding \$0.50	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$462.0 \$1,344.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip)	Image: PAEC No 1 No 2 2	E Report) Pages 100 100 Sheets (**) 20 20	Copies (*) 14 14 Copies (*) 14	1,400 1,400 1,400 Total Sheets 560 560	\$0.05 Cost (B/W) \$0.50	\$0.50	\$4.00 \$4.00 Binding \$0.50	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$462.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Kotes: *) Distribution - Team (4 sets) + Clien (10 sets)	No 1 2 2 2	E Report) Pages 100 100 Sheets (**) 20 20	Copies (*) 14 14 14 Copies (*) 14 14	1,400 1,400 1,400 Total Sheets 560 560	\$0.05 Cost (B/W) \$0.50	\$0.50	\$4.00 \$4.00 Binding \$0.50	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$482.0 \$1,344.0 \$400.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip)	(PAEC No 1 1 1 No 2 2 2 2	E Report) Pages 100 100 Sheets (**) 20 20 20 20 70	Copies (*) 14 14 14 Copies (*) 14 14 14 TAL COST	1,400 1,400 1,400 Total Sheets 560 560	\$0.05 Cost (B/W) \$0.50	\$0.50	\$4.00 \$4.00 Binding \$0.50	\$126. \$756. \$882. Total \$294. \$168. \$462. \$1,344. \$400.
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL TOTAL TOTAL TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Rotes: *) Distribution - Team (4 sets) + Clien (10 sets **) 20 drawings, 2 submissions ASK 4.16: Detailed Geotechnical Inves	(PAEC No 1 1 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3	E Report) Pages 100 100 Sheets (**) 20 20 TO	Copies (*) 14 14 Copies (*) 14 14 14 TAL COST	1,400 1,400 1,400 Total Sheets 560 560 560	\$0.05 Cost (B/W) \$0.50 \$0.10	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$1,344.0 \$400.0 \$1,744.0
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Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Draft TOTAL TOTAL TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Otes: Distribution - Team (4 sets) + Clien (10 sets) *) Distribution - Team (4 sets) + Clien (10 sets) *) 20 drawings, 2 submissions ASK 4.16: Detailed Geotechnical Investions Rooks - 8 ½ x 11 (*) Geotechnical Report - Draft Geotechnical Report - Final TOTAL	(PAEC No 1 1 No 2 2 2 3) No. 1 1 1	E Report) Pages 100 100 Sheets (**) 20 20 20 0 100 (Geotechnica Pages 200 200 200 200 200 200 200 200 200 20	Copies (*) 14 14 Copies (*) 14 14 14 14 14 14 14 14 14 14	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 560 3,600 3,600 3,600	\$0.05 Cost (B/W) \$0.50 \$0.10 Cost (B/W) \$0.05	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00	\$125.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$462.0 \$1,344.0 \$400.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$252.0 \$1,872.0 \$2,124.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Kotes:) Distribution - Team (4 sets) + Clien (10 sets **) 20 drawings, 2 submissions ASK 4.16: Detailed Geotechnical Invest Books - 8 ½ x 11 (*) Geotechnical Report - Draft Geotechnical Report - Final TOTAL Prawings (*)	(PAEC No 1 1 1 No 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	E Report) Pages 100 100 Sheets (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 Copies (*) 14 14 14 14 14 14 14 14 14 14	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 3,600 3,600 3,600 3,600 Total Sheets	\$0.05 Cost (B/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W)	\$0.50 Cest (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 Binding	\$125.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$462.0 \$1,344.0 \$400.0 \$1,344.0 \$400.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,872.0 \$1,872.0 \$2,124.0 Total
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip)	(PAEC No 1 1 1 No 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	E Report) Pages 100 100 Sheets (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 Copies (*) 14 14 14 14 14 14 14 14 14 14	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 360 3,600 3,600 3,600 3,600 1,440	\$0.05 Cost (E/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W) \$0.50	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 \$4.00	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$462.0 \$1,344.0 \$440.0 \$1,744.0 \$1,740.00\$100.00\$100000000000000000000000000
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Fuil Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Otes: Distribution - Team (4 sets) + Clien (10 sets POID drawings, 2 submissions ASK 4.16: Detailed Geotechnical Invest Books - 8 ½ x 11 (*) Geotechnical Report - Draft Gotes: TOTAL	(PAEC No 1 1 1 No 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	E Report) Pages 100 100 Sheets (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 Copies (*) 14 14 14 14 14 14 14 14 14 14	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 3,600 3,600 3,600 3,600 Total Sheets	\$0.05 Cost (B/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W)	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 Binding	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$168.0 \$1,344.0 \$1,344.0 \$1,344.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,872.0 \$1,872.0 \$2,124.0 Total \$252.2 \$1,872.0 \$2,124.0 Total \$738.0 \$288.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Rotes: *) Distribution - Team (4 sets) + Clien (10 sets **) 20 drawings, 2 submissions ASK 4.16: Detailed Geotechnical Invest Books - 8 ½ x 11 (*) Geotechnical Report - Draft Geotechnical Report - Draft Geotechnical Report - Final TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL	(PAEC No 1 1 1 No 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	E Report) Pages 100 100 Sheets (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 Copies (*) 14 14 14 14 14 14 14 14 14 14	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 560 560 560 560 560	\$0.05 Cost (E/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W) \$0.50	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 \$4.00	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$462.0 \$1,344.0 \$1,344.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,872.0 \$2,124.0 Total \$738.0 \$738.0 \$1,026.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) botes:) Distribution - Team (4 sets) + Clien (10 sets **) 20 drawings, 2 submissions ASK 4.16: Detailed Geotechnical Invest Books - 8 ½ x 11 (*) Geotechnical Report - Draft Geotechnical Report - Draft Geotechnical Report - Draft TOTAL TOTAL TOTAL TOTAL Fawings (*) Full Size Half Size - 11 x 17 TOTAL	(PAEC No 1 1 1 No 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	E Report) Pages 100 100 Sheets (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 Copies (*) 14 14 14 14 14 14 14 14 14 14	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 560 560 560 560 560	\$0.05 Cost (E/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W) \$0.50	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 \$4.00	\$126.0 \$756.0 \$882.0 Total \$294.0 \$168.0 \$462.0 \$462.0 \$462.0 \$440.0 \$1,344.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,744.0 \$1,872.0 \$2,124.0 Total \$252.2 \$1,872.0 \$2,124.0 Total \$738.0 \$288.0
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Kotes: *) Distribution - Team (4 sets) + Clien (10 sets **) 20 drawings, 2 submissions CASK 4.16: Detailed Geotechnical Invest Books - 8 ½ x 11 (*) Geotechnical Report - Draft Geotechnical Report - Draft Geotechnical Report - Final TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL	(PAEC No 1 1 1 2 2 2 2 2 3) 3) 3) 3) 3) 30 30 30 30 30 30 30 30 30 30 30 30 30	E Report) Pages 100 100 Shects (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 Copies (*) 14 14 14 14 14 14 14 14 14 14	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 560 560 560 560 560	\$0.05 Cost (E/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W) \$0.50	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 \$4.00	\$126. \$756. \$882. Total \$294. \$168. \$462. \$1,344. \$400. \$1,344. \$400. \$1,744. \$400. \$1,744. \$252. \$1,872. \$2,124. Total \$252. \$1,872. \$2,124. \$2,124. \$3,150. \$3,150. \$3,150.
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) kotes: *) 20 drawings, 2 submissions FASK 4.16: Detailed Geotechnical Invest Books - 8 ½ x 11 (*) Geotechnical Report - Draft Geotechnical Report - Draft Geotechnical Report - Final TOTAL Full Size Half Size - 11 x 17 TOTAL	(PAEC No 1 1 No 2 2 2 2 3) 1 1 1 1 1 1 1 1 1 1 1 2 2 2 3)	E Report) Pages 100 100 Shects (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 14 Copies (*) 14 14 TAL COST I Report) Copies (*) 18 18 18 18 18 18	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 560 560 560 560 560	\$0.05 Cost (E/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W) \$0.50	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 \$4.00	\$126. \$756. \$882. Total \$294. \$168. \$462. \$1,344. \$400. \$1,744. \$400. \$1,744. \$252. \$1,872. \$2,124. Total \$252. \$1,872. \$2,124. \$738. \$238. \$238. \$1,026. \$1,026. \$3,150. \$400. \$400. \$1,026.\\\$1,026.\\
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL TOTAL Prawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Otes: Distribution - Team (4 sets) + Clien (10 sets * 20 drawings, 2 submissions ASK 4.16: Detailed Geotechnical Invest TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) TOTAL PRINTING DELIVERY (\$200 per trip)	(PAEC No 1 1 No 2 2 2 2 3) 1 1 1 1 1 1 1 1 1 1 1 2 2 2 3)	E Report) Pages 100 100 Shects (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 14 Copies (*) 14 14 TAL COST I Report) Copies (*) 18 18 18 18 18 18	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 560 560 560 560 560	\$0.05 Cost (E/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W) \$0.50	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 \$4.00	\$126. \$756. \$882. Total \$294. \$168. \$462. \$1,344. \$400. \$1,744. \$400. \$1,744. \$252. \$1,872. \$2,124. Total \$252. \$1,872. \$2,124. \$738. \$238. \$238. \$1,026. \$1,026. \$3,150. \$400. \$400. \$1,026.\\\$1,026.\\
Books - 8 ½ x 11 (*) PAECE Report - Draft PAECE Report - Final TOTAL TOTAL Prawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Otes: Distribution - Team (4 sets) + Clien (10 sets * 20 drawings, 2 submissions ASK 4.16: Detailed Geotechnical Invest TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) TOTAL PRINTING DELIVERY (\$200 per trip)	(PAEC No 1 1 No 2 2 2 2 3) 1 1 1 1 1 1 1 1 1 1 1 2 2 2 1 1 1 1 1	E Report) Pages 100 100 Shects (**) 20 20 20 20 20 20 20 20 20 20	Copies (*) 14 14 14 Copies (*) 14 14 TAL COST I Report) Copies (*) 18 18 18 18 18 18	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 560 560 560 560 560	\$0.05 Cost (E/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W) \$0.50	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 \$4.00 \$4.00 \$4.00	\$126. \$756. \$882. Total \$294. \$168. \$462. \$1,344. \$400. \$1,744. \$400. \$1,744. \$252. \$1,872. \$2,124. Total \$252. \$1,872. \$2,124. \$738. \$238. \$238. \$1,026. \$1,026. \$3,150. \$400. \$400. \$1,026.\\\$1,026.\\
PAECE Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL PRINTING DELIVERY (\$200 per trip) Notes: (*) Distribution - Team (4 sets) + Clien (10 sets (**) 20 drawings, 2 submissions TASK 4.16: Detailed Geotechnical Invest Books - 8 ½ x 11 (*) Geotechnical Report - Draft Geotechnical Report - Draft Geotechnical Report - Final TOTAL Drawings (*) Full Size Half Size - 11 x 17 TOTAL TOTAL TOTAL	(PAEC No 1 1 No 2 2 2 2 3) 1 1 1 1 1 1 1 1 1 1 1 2 2 2 1 1 1 1 1	E Report) Pages 100 100 Sheets (**) 20 20 20 20 (Geotechnica Pages 200 200 Sheets (**) 40 40 1 TO	Copies (*) 14 14 14 Copies (*) 14 14 TAL COST I Report) Copies (*) 18 18 18 18 18 18	1,400 1,400 1,400 Total Sheets 560 560 560 560 560 560 560 560 560 560	\$0.05 Cost (E/W) \$0.50 \$0.10 Cost (B/W) \$0.05 Cost (B/W) \$0.50	\$0.50 Cost (Color)	\$4.00 \$4.00 Binding \$0.50 \$4.00 Binding \$4.00 Binding \$0.50 \$4.00	\$12: \$75: \$88: Total \$29: \$16: \$46: \$1,34 \$40: \$1,74 \$40: \$1,74 \$40: \$1,74 \$25: \$1,872 \$2,124 Total \$25: \$1,872 \$2,124 Total \$25: \$1,872 \$2,124 Total \$2,55 \$1,872 \$2,124 \$1,124\$1,124

	EXP	ENSES DETA	IL - TRAVEL				
FIRM: Hardesty & Hanover/ Gannett Fle	oming JV						
TASK 1: Project Management						-	
PROJECT MEETINGS (*)				No. of Staff	No. of Trips	Fare	Total Cost
Hardesty & Hanover				Ho: Of Olari	No. of Thes		rotar ooat
NYC				4	24	\$10.00	\$960.0
Trenton, NJ				3	24	\$25.00	\$1,800.0
TOTAL H&H						420.00	\$2.760.0
Gannett Fleming		1000					
Audubon, PA				4	24	\$150.00	\$14,400.0
Plainfield, NJ				3	24	\$10.00	\$720.0
TOTAL GF							\$15,120.0
Haley & Aldrich						1	
Parsippany, NJ				1	24	\$15.00	\$360.0
TOTAL H&A							\$360.0
	Ť	DTAL COST				1	\$18,240.0
Notes:							
(*) Train trips to project meetings - 1 progress mee	ting & 1 coordination	on meeting per n	nonth				
TASK 2: Risk Management							
MEETINGS / WORKSHOPS (*)	No. of Trips	Days Each	Lodging	M&E	Total	Air Fare	Total Cost
Hardesty & Hanover				1			
Risk Manager	4	2	\$134	\$61	\$1,560.00	\$2,800.00	\$4,360.0
TOTAL HEH	1			Ì			\$4,360.0
	TC	DTAL COST					\$4,360.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping							
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*)	No of Trips	Miles	Cost / Mile	Total	Tolls	Rental	Total Cost
Notes: (*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group						Rental	
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ	44	30	\$0.55	\$726.00	\$440.00	Rental	\$1,166.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC						Rental	Total Cost \$1,166.0 \$2,354.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK	44	30	\$0.55	\$726.00	\$440.00	Rental	\$1,166.0 \$2,354.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC	44	30	\$0.55	\$726.00	\$440.00	Rental	\$1,166.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes:	44	30	\$0.55	\$726.00	\$440.00	Rental	\$1,166.0 \$2,354.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Naik Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days)	44	30	\$0.55	\$726.00	\$440.00	Rental	\$1,166.0 \$2,354.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report	44	30 70	\$0.55 \$0.55	\$726.00 \$1.694.00	\$440.00 \$660.00		\$1,166.0 \$2,354.0 \$3,520.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*)	44	30 70	\$0.55 \$0.55	\$726.00 \$1.694.00	\$440.00 \$660.00		\$1.166.0 \$2,354.0 \$3,520.0 Total Cost
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover	44 44 No of Trips	30 70 Miles	\$0.55 \$0.55 Cost / Mile	\$726.00 \$1,694.00 Total	\$440.00 \$660.00 Tolls		\$1,166.0 \$2,354.0 \$3,520.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC	44 44 No of Trips	30 70 Miles 70	\$0.55 \$0.55 Cost / Mile \$0.55	\$726.00 \$1,694.00 Total \$77.00	\$440.00 \$660.00 Tolls \$30.00		\$1.166.0 \$2,354.0 \$3,620.0 Total Cost \$107.0 \$119.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ	44 44 No of Trips	30 70 Miles 70	\$0.55 \$0.55 Cost / Mile \$0.55	\$726.00 \$1,694.00 Total \$77.00	\$440.00 \$660.00 Tolls \$30.00		\$1,166.0 \$2,354.0 \$3,520.0 Total Cost \$107.0 \$119.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H	44 44 No of Trips	Miles 70 70 70 90	\$0.55 \$0.55 Cost / Mile \$0.55	\$726.00 \$1,694.00 Total \$77.00	\$440.00 \$660.00 Tolls \$30.00		\$1.166.0 \$2,354.0 \$3,520.0 Total Cost \$107.0 \$119.0 \$226.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming	A4 44 No of Trips 2 2	Miles 70 70 70 90 250	\$0.55 \$0.55 Cost / Mile \$0.55 \$0.55	\$726.00 \$1,694.00 Total \$77.00 \$99.00	\$440.00 \$660.00 Tolls \$30.00 \$20.00		\$1.166.0 \$2,354.0 \$3,520.0 Total Cost \$107.0 \$119.0 \$226.0 \$610.0
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon, PA	44 44 No of Trips 2 2 2 2 4 4 2	Miles 70 70 70 90 250 250	\$0.55 \$0.55 Cost / Mile \$0.55 \$0.55 \$0.55	\$726.00 \$1,694.00 Total \$77.00 \$99.00 \$550.00	\$440.00 \$660.00 Tolls \$30.00 \$20.00		\$1,166.0 \$2,354.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$119.0 \$119.0 \$226.0 \$225.5 \$637.5
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars, 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon, PA Plainfield, NJ	44 44 No of Trips 2 2 2 2 4 4 2	Miles 70 70 70 90 250	\$0.55 \$0.55 Cost / Mile \$0.55 \$0.55 \$0.55	\$726.00 \$1,694.00 Total \$77.00 \$99.00 \$550.00	\$440.00 \$660.00 Tolls \$30.00 \$20.00		\$1.166.0 \$2,354.0 \$3,520.0 Total Cost
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Naik Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon, PA Plainfield, NJ TOTAL GF	44 44 No of Trips 2 2 2 2 4 4 2	Miles 70 70 70 90 250 255	\$0.55 \$0.55 Cost / Mile \$0.55 \$0.55 \$0.55	\$726.00 \$1,694.00 Total \$77.00 \$99.00 \$550.00	\$440.00 \$660.00 Tolls \$30.00 \$20.00		\$1,166.0 \$2,354.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$119.0 \$119.0 \$226.0 \$225.5 \$637.5
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon. PA Plainfield, NJ TOTAL GF Notes: (*) Trips by car	44 44 No of Trips 2 2 2 2 4 4 2	Miles 70 70 70 90 250 255	\$0.55 \$0.55 Cost / Mile \$0.55 \$0.55 \$0.55	\$726.00 \$1,694.00 Total \$77.00 \$99.00 \$550.00	\$440.00 \$660.00 Tolls \$30.00 \$20.00		\$1,166.0 \$2,354.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$3,520.0 \$119.0 \$119.0 \$226.0 \$225.5 \$637.5
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars, 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon, PA Plainfield, NJ TOTAL GF Notes: (*) Trips by car TASK 4.10: VE Report	44 44 No of Trips 2 2 2 2 4 4 2 70	Miles 70 90 250 25 DTAL COST	\$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55	\$726.00 \$1.694.00 Total \$77.00 \$99.00 \$550.00 \$27.50	\$440.00 \$560.00 Tolls \$30.00 \$20.00 \$20.00	Rentai	\$1.166.0 \$2,354.0 \$3,520.0 \$3,520.0 \$107.0 \$119.0 \$226.0 \$610.0 \$27.5 \$637.5 \$863.5
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon, PA Plainfield, NJ TOTAL GF Notes: (*) Trips by car TASK 4.10: VE Report VE WORKSHOP (*)	44 44 No of Trips 2 2 2 2 4 4 2	Miles 70 70 70 90 250 255	\$0.55 \$0.55 Cost / Mile \$0.55 \$0.55 \$0.55	\$726.00 \$1,694.00 Total \$77.00 \$99.00 \$550.00	\$440.00 \$660.00 Tolls \$30.00 \$20.00		\$1.166.0 \$2,354.0 \$3,520.0 \$3,520.0 \$107.0 \$119.0 \$226.0 \$610.0 \$27.5 \$637.5 \$863.5
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon. PA Plainfield, NJ TOTAL GF Notes: (*) Trips by car TASK 4.10: VE Report VE WORKSHOP (*) Envision	44 44 No of Trips 2 2 2 2 4 4 2 70	Miles Miles 70 90 250 25 DTAL COST	Cost / Mile \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55	\$726.00 \$1.694.00 Total \$77.00 \$99.00 \$550.00 \$27.50	\$440.00 \$560.00 Tolls \$30.00 \$20.00 \$20.00	Rentai	\$1,166.0 \$2,354.0 \$3,520.0 Total Cost \$107.0 \$119.0 \$226.0 \$610.0 \$27.5 \$637.5 \$863.5
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon, PA Plainfield, NJ TOTAL GF Notes: (*) Trips by car TASK 4.10: VE Report VE WORKSHOP (*)	A4 44 44 44 22 22 4 4 22 70 70 70 No of Trips	Miles Miles 70 90 250 25 DTAL COST	\$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55	\$726.00 \$1.694.00 \$1.694.00 Total \$77.00 \$99.00 \$99.00 \$27.50	\$440.00 \$660.00 Tolls \$30.00 \$20.00 \$20.00 \$60.00	Rental	\$1.166.0 \$2,354.0 \$3,520.0 \$3,520.0 \$107.0 \$107.0 \$119.0 \$226.0 \$610.0 \$27.5 \$637.5 \$863.5
(*) Tips to VE Vorksops - 4 meetings TASK 4.2: Survey & Base Mapping FIELD SURVEY (*) Nalk Consulting Group Edison, NJ NYC TOTAL NAIK Notes: (*) 2 cars. 2 months (44 days) TASK 4.9: Feasibility Report SITE VISITS (*) Hardesty & Hanover NYC Trenton, NJ TOTAL H&H Gannett Fleming Audubon. PA Plainfield, NJ TOTAL GF Notes: (*) Trips by car TASK 4.10: VE Report VE WORKSHOP (*) Envision VE Staff (4 people)	A4 A4 A4 A4 A4 A4 A4 A2 A2 A4 A2 A4 A2 A4 A2 A4 A2 A4 A4 A4 A4 A4 A4 A4 A4 A4 A4 A4 A4 A4	Miles Miles 70 90 250 25 DTAL COST	Cost / Mile \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55 \$0.55	\$726.00 \$1.694.00 \$1.694.00 Total \$77.00 \$99.00 \$99.00 \$27.50	\$440.00 \$660.00 Tolls \$30.00 \$20.00 \$20.00 \$60.00	Rental	\$1,166.0 \$2,354.0 \$3,520.0 Total Cost \$107.0 \$119.0 \$226.0 \$610.0 \$27.5 \$637.5 \$863.5 Total Cost

	EXPEN	ISES DETA	IL - TRAVEL				
FIRM: Hardesty & Hanover/ Gannett F	ieming JV						
TASK 4.12: Preliminary Design							
SITE VISITS (*)	No. of Trips	Miles	Cost / Mile	Total	Tolls	Rental	Total Cost
Hardesty & Hanover				-			
NYC	4	70	\$0.55	\$154.00	\$60.00		\$214.0
Trenton, NJ	2	90	\$0.55	\$99.00	\$20.00		\$119.0
TOTAL H&H							\$333.0
Gannett Fleming							
Audubon, PA	4	250	\$0.55	\$550.00	\$60.00		\$610.0
Plainfield, NJ	2	25	\$0.55	\$27.50			\$27.5
TOTAL GF							\$637.5
	TOT	AL COST			-		\$970.5
TASK 4.16: Detailed Geotechnical Investig	ation			-			
	No. of Trips	Miles	Cost / Mile	Total	Tolls	Rental (**)	Total Cost
TASK 4.16: Detailed Geotechnical Investig BORING INSPECTIONS (*) Hardesty & Hanover		Miles	Cost / Mile	Total	Tolls	Rental (**)	Total Cost
BORING INSPECTIONS (*)		Miles 90	Cost / Mile	Total \$10,890.00	Tolls \$2,200.00	Rental (**)	
BORING INSPECTIONS (*) Hardesty & Hanover Trenton, NJ TOTAL H&H	No. of Trips					Rental (**)	\$13,090.0
BORING INSPECTIONS (*) Hardesty & Hanover Trenton, NJ	No. of Trips					Rental (**)	\$13,090.0
BORING INSPECTIONS (*) Hardesty & Hanover Trenton, NJ TOTAL H&H	No. of Trips					Rental (**)	\$13,090.0 \$13,090.0
BORING INSPECTIONS (*) Hardesty & Hanover Trenton, NJ TOTAL H&H Haley & Aldrich	No. of Trips 220 	90	\$0.55	\$10,890.00	\$2,200.00		\$13,090.0 \$13,090.0 \$30,635.0
BORING INSPECTIONS (*) Hardesty & Hanover Trenton, NJ TOTAL H&H Haley & Aldrich Parsippany, NJ	No. of Trips 220 	90	\$0.55	\$10,890.00	\$2,200.00		\$13,090.0 \$13,090.0 \$30,635.0 \$30,635.0
BORING INSPECTIONS (*) Hardesty & Hanover Trenton, NJ TOTAL H&H Haley & Aldrich Parsippany, NJ	No. of Trips 220 330 701	90	\$0.55	\$10,890.00	\$2,200.00		Total Cost \$13,090.0 \$13,090.0 \$30,635.0 \$30,635.0 \$43,725.0

EXPENSES DETAIL - SURVEY &	TESTING				
FIRM: Hardesty & Hanover/ Gannett Fleming JV					
TASK 4.2: Survey & Base Mapping					
Naik Consulting Group					
EQUIPMENT	Days	Cost / Day	Total Cost		
MPT Truck		4 \$800.00	\$3,200.0		
TOTAL EQUIPMENT			\$3,200.0		
SURVEY (*)	1000		Lump Sum		
Photogrammetry - GEOD			\$85,000.0		
Subsurface Utility Survey - Taylor Wiseman Taylor (SUE)			\$100,000.0		
TOTAL SURVEY			\$185,000.0		
TOTAL COST			\$188,200.0		
TASK 4.16: Detailed Geotechnical Investigation					
BORINGS & SURVEY (*)			Lump Sum		
Borings			\$1,985,150.0		
Geophisical Survey			\$16,150.0		
Diving Inspection Allowance - As Needed (**)					
Testing Lab			\$200,000.0		
TOTAL SURVEY					
<u>Notes;</u> (*) See backup (**) It's an allowance. The scope cannot be determined without knowing the actual conditions					
TOTAL SURVEY & TESTING			\$2,404,500.0		

EXPENSES DETAIL - MISCEL	LANEOUS ODCs		
IRM: Hardesty & Hanover/ Gannett Fleming JV			
ASK 1: Project Management			
	Months	Cost / Month	Total Cost
JV FIRMS (H&H and GF)			
Postage / Fedex	12	\$100.00	\$1,200.0
Delivery	12	\$40.00	\$480.0
Other (phone, photos, etc.)			\$200.0
TOTAL JV			\$1,680.0
SUBCONSULTANTS			
Major Subs (H&A, Envision, JCMS)		_	
Postage / Fedex	12	\$30.00	\$360.0
Delivery	12	\$25.00	\$300.0
Other (phone, photos, etc.)			\$100.0
TOTAL EACH SUB			\$760.0
Other Subs (Griffin, Radin, SJH)			
Postage / Fedex	12	\$15.00	\$180.0
Other (phone, photos, etc.)			\$40.0
TOTAL EACH SUB			\$220.0
H&A			\$760.0
Griffin			\$220.0
Naik			\$760.0
Envision			\$760.0
JCMS			\$760.0
Radin			\$220.0
SJH			\$220.0
TOTAL SUBCONSULTANTS			\$3,700.0
TOTAL MISCELLANEOUS OD	Ćs.		\$5,380.0

NJ TRANSIT RFP No. 15-044

Design, Engineering and Construction Assistance Services for the Replacement of Raritan River Bridge

DIRECT EXPENSE BACKUP

A. Esteban & Company, Inc.

132 West 36th St, 10th fl New York, NY 10018

September 16, 2015

Ms. Visha Szumanski Hardesty & Hanover 1501 Broadway New York, NY10023

Re: Digital Reproduction costs / NJ Transit Raritan River Bridge

Dear Ms. Szumanski:

Thank you for the opportunity to quote on your present printing requirements. The prices are as follows:

WIDE FORMAT

. ...

1.	Digital Printing on Bond, 1st copy	\$ 0.08 sq.ft.
2.	Digital Printing on Bond, add'l copy	\$ 0.08 sq.ft.
3.	Digital Printing on Bond, half-size 1st	\$ 0.08 sq.ft.
4.	Digital Printing on Bond, half-size add'l	\$ 0.08 sq.ft.
5.	Print binding w-strip	\$ 0.50 each
6.	Cad Plotting Bond B/W 1st plot	\$ 0.08 sq. ft
7.	Cad Plotting Bond B/W add'l	\$ 0.08 sq. ft
8.	Color plot on Pres Bond (Inkjet)	\$ 2.50 sq. ft
9.	Color plot on Gloss/Semi Photo (Inkjet)	\$ 5.00 sq. ft
10.	Mounting on foamcore	\$ 4.00 sq. ft
П.	Laminating	\$ 4.00 sq. ft
SMA	LL FORMAT	
12.	Photocopy 8.5" x 11" B/W	\$ 0.05 each
13.	Photocopy 8.5" x 11" color	\$ 0.50 each
14.	Photocopy 11" x 17" B/W	\$ 0.10 each
15.	Photocopy 11" x 17" color	\$ 0.75 each
16.	Acco bind, 8.5" x 11"	\$ 3.00 each
17.	GBC Bind/Wire O Bind, 8.5 x 11"	\$ 3.00 each
18.	Acetate front / black vinyl back	\$ 1.00 each
WEB	-BASED DOCUMENT MANAGEMENT- DIGITAL SERVICES	
1 9 .	PDF conversion	\$ 0.25 ea.
20.	Rename-update Master/per file	\$ 0.50 ea.
21.	Scan, upload, & index DWGS to PROJECTWEB system	No Charge
22.	Scan, upload, & index SPECS to PROJECTWEB system	No Charge
23.	Use of ProjectWeb (Unlimited Users)	No Charge
24.	FTP Hosting Monthly - up to 4.99GB	\$ 10.00
25.	FTP Hosting Monthly - over 5 GB	\$ 20.00
26.	FTP Hosting Monthly - over 25 GB	\$ 49.00
27.	Projectweb/FTP Download Throughput up to 25k mb	\$ 0.10/MB
27a.	Projectweb/FTP Download Throughput 25k-50k mb	\$ 0.075/MB
27b.	Projectweb/FTP Download Throughput over 50k mb	\$ 0.05/MB

If I can help you further please contact me at (212) 714-0102. Thank you for thinking of us.

Sincerely, Chris Esteban

Expense Backup: Survey - Photogrammetry



GEOD CORPORATION

PHOTOGRAMMETRIC SCIENCES - SURVEY TECHNOLOGIES 18-24 Kanouse Road • Newfoundland, NJ 07435 • (973) 697-2122 • FAX (973) 838-6433

SUMMARY OF STAFFING

CLIENT:

Naik

June 25, 2015

GEOD # p15-091

\$30,131.98

\$43,058.60

\$5,423.76

\$5,745.00

\$84,359.34

PROJECT:

NJ Transit over the Raritan River

TITLE	ASCE		TOTAL				
	GRADE	1	2	3	4	5	HOURS
Principal/Owner	PIX	12	6	0	0	0	18
Project Manager	PV	48	24	0	0	0	72
Senior Technician	ET5	280	40				320
Technician	ET4	200					200
Chief of Party	ET4		100				100
Instrumentperson	ET3		100				100
Rodperson	ET2						0
Clerical Salaries	Clerical						0
TOTAL		540	270	0	0	0	810

CURRENT	DIRECT
HOURLY	TECHNICAL
RATE	LABOR
\$65.05	\$1,170.90
\$50.94	\$3,667.68
\$39.82	\$12,742.40
\$31.15	\$6,230.00
\$34.87	\$3,487.00
\$28.34	\$2,834.00
\$21.63	\$0.00
\$28.99	\$0.00
	\$30,131.98

DIRECT EXPENSES:

Direct Expense Total:				\$5 745 00				
	<u> </u>			\$0.00			TOTAL	Ļ
				\$250.00				l
				\$0.00				Ļ
	days @		per day	\$0.00		DIRE	CT EXPENSES	l
2727	miles @) \$0. 5	5/mile	\$1,500.00		18%	FEE	l
	days @		per day	\$0.00		142.9%	OVERHEAD	ł
				\$3,995.00			PAYROLL	l
		2727 miles @ days @	days @	2727 miles @ \$0.55/mile days @ per day	days @ per day \$0.00 2727 miles @ \$0.55/mile \$1,500.00 days @ per day \$0.00 days @ per day \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	days @ per day \$0.00 2727 miles @ \$0.55/mile \$1,500.00 days @ per day \$0.00	days @ per day \$0.00 142.9% 2727 miles @ \$0.55/mile \$1,500.00 18% days @ per day \$0.00 DIRE	days @ per day \$0.00 142.9% OVERHEAD 2727 miles @ \$0.55/mile \$1,500.00 18% FEE days @ per day \$0.00 DIRECT EXPENSES

TASKS

- 1) Obtain 1.8cm digital imagery, provide photo control w/ 4 pairs, prepare LAMP mapping along RR R-O-W with 1' DTM contours in NJ Transit specification MicroStation V8i/SelectCAD
- 2) Set ±68 preflight targets and 4 control pairs. Perform control survey and prepare control report.
- Note: Mapping limits for 3.4 miles begin at 400' total width for abutments + 500', then taper to 100' total width at project ends as per the Google Earth file p15-091 Limits.kmz accompanying this summary of hours spreadsheet.

Expense Backup: Subsurface Utility Survey

RFP NO. 15-044 NJ TRANSIT BRIDGE OVER RARITAN RIVER

6/25/2015 REVISED 10-12-15

SUE TASK	DESIGNATING (DAYS)	2 MAN CREW DAILY RATE PER DAY	DESIGNATING TOTAL ESTIMATE	
PERTH AMBOY DESIGNATING (ASSUME 10 DAYS, 10 HOUR DAYS)	10	\$2,100	\$21,000	
SOUTH AMBOY DESIGNATING (ASSUME 10 DAYS, 10 HOUR DAYS)	10	\$2,100	\$21,000	\$42,000

SUE TASK	TEST HOLES ASSUME 3 PER DAY)	3 MAN CREW DAILY RATE PER DAY	TEST HOLES TOTAL ESTIMATE	
PERTH AMBOY TEST HOLES (ASSUME 15 TEST HOLES, ON LAND ONLY)	5	\$4.500	\$22,500	
SOUTH AMBOY TEST HOLES (ASSUME 15 TEST HOLES, ON LAND ONLY)	5	\$4,500	\$22,500	\$45,000

ASSUMPTIONS: NJ TRANSIT FLAGGING COSTS NOT INCLUDED IN THIS COSTS. GF TO COORDINATE THE EFFORT AND COST OF NJ TRANSIT FLAGGING	ESTIMATE: TRAFFIC CONTROL	\$87,000 <u>\$13,000</u>
GF TO COORDINATE THE EFFORT AND COST OF NJ TRANSIT FLAGGING.	TOTAL ESTIMATED COSTS:	\$100,000

Expense Backup: Borings

JERSEY BORING & DRILLING CO., INC.

36 PIER LANE WEST, FAIRFIELD, NJ 07004

PHONE (973) 287-6857 FAX (973) 521-7891

To: Name: Ed Zamiskie		From:	Dennis Spearnock		
Company:	Haley & Aldrich		Date:	6/30/2015	
Phone No: E-Mail:	973-658-3909 ezamiskie@haleyaldrich.com		Page 1 of	2	
			Quote No.	Q15-251	
		F	Revised:	9/17/2015	
Project:	NJT Raritan River Bridge				
	Dorth Amhou Couth Amhou MJ				

Perth Amboy-South Amboy, NJ

Jersey Boring and Drilling Co., Inc. is pleased to present this proposal to conduct seventy (70) water borings and ten (10) land borings to a depth of approximately seventy five to one hundred thirty five (75'-135') feet at the above mentioned site. Cone penetrometer testing will be performed with truck mounted drilling equipment.

Land Borings						
ITEM	U	INIT RATE	UNITS	QUANTITY		TOTAL
Mobilization/demobilization rig	\$	7,000.00	LS	1	\$	7,000.00
Railroad safety training(Water & land)	\$	10,000.00	LS	1	\$	10.000.00
Soil drilling with continuous sampling to					•	
ten feet and at five foot intervals						
thereafter	\$	39.00	Per foot	800	\$	31,200.00
N-size rock coring or coring obstructions, i	\$	65.00	Per foot	120	\$	7,800.00
Steel Shelby tubes	\$	150.00	Each	10	-	·
Grouting of boreholes		5.00	Per foot	920	\$	4,600.00
Drums, if required	\$	100.00	Each	20	\$	2,000.00
NJDEP boring permit	\$	1,800.00	Each	2	\$	3,600.00
Crosshole seismic testing, 3 hole array		12,000.00	Each	2	\$	24,000.00
Crosshole seismic testing, casing install	\$	49.00	Per foot	600	\$	29,400.00
Stand by time	\$	300.00	Crew Hour	2	\$	600.00
Cone Penetrometer Soundings	\$	27.00	Per foot	500	\$	13,500.00

ESTIMATED TOTAL \$ 133,700.00

Water Borings					
ITEM	U	INIT RATE	UNITS	QUANTITY	TOTAL
Mobilization/demobilization 2 rigs Sinking casing minimum 10' below	\$	82,000.00	LS	1	\$ 82,000.00
mucline, including water Soil drilling with continuous sampling to ten feet and at five foot intervals	\$	62.00	Per foot	2100	\$ 130,200.00
thereafter, 0-50' Soil drilling with continuous sampling to	\$	124.00	Per foot	3500	\$ 434,000.00
ten feet and at five foot intervals thereafter, 50-100' Soil drilling with continuous sampling to ten feet and at five foot intervals	\$	141.00	Per foot	3000	\$ 423,000.00
thereafter100-150'	\$	189.00	Per foot	1750	\$ 330,750.00

N-size rock coring or coring obstructions, i \$	215.00	Per foot	2100	\$ 451,500.00
Additional split spoon samples \$	75.00	Each	0	
Steel Shelby tubes \$	550.00	Each	20	\$ 11,000.00
Grouting of boreholes \$	10.00	Per foot	10350	\$ 103,500.00
Drums, if required \$	100.00	Each	140	\$ 14,000.00
NJDEP test boring site permit \$	1,800.00	Each	2	\$ 3,600.00
Stand by time \$	800.00	Crew Hour	2	\$ 1,600.00

NOTE:

ESTIMATED TOTAL \$ 1,985,150.00

NJ DEP requires coordinates for all wells and permitted borings to be given in the NJ State Plane system either by a licensed surveyor or with differential GPS. Client to provide NJ State Plane coordinates including name license number of the surveyor. All drums/drill cuttings to remain on site for testing and disposal by others. We will require a site visit and a boring location plan prior to entering a contract to perform the work.

Jersey Boring and Drilling Co., Inc. will provide driller's field logs. Typed logs can be provided for a fee of \$80.00 per hour with a one hour minimum charge. Engineering reports and inspections will be the responsibility of the client and is not included in our services.

All fees are based on providing our standard insurance.

On water boring fees are based on two barges working continuous twenty four hour operation, excluding weekends. Land fees are based on working weekdays between the hours of 7:00am and 3:30pm. Additional premium rates will be charged for other hours. Time not worked due to Railroad issues will be billed at the applicable standby rate.

If flagmen are required they shall be provided at no cost to Jersey Boring.

We will call for a utility mark out, however the location of any on site under-ground utilities, tanks, or buried structures must be identified by the client or owner before we can start drilling. The initial onecall fee is included in the price for mobilization/Demobilization. A fee of \$50.00 will be billed for additional one-calls required due to project scheduling conflicts or cancellations.

Our employees are members of Local 1556 in NYC with the classification of core drillers. Any additional union employees required to satisfy other unions will be the responsibility of others.

Samples will be stored in our facilities for up to one year from the date of drilling. After one year all samples not taken by the client will be disposed of at our discretion.

It is our assumption that the site is not contaminated with hazardous materials, if any should be encountered during the drilling activities, the client will be contacted and a mutual agreement will be made about how to proceed. Any additional cost due to the hazardous materials will be agreed to before drilling resumes.

If the above terms and conditions are acceptable to you, please sign the bottom of this fee schedule and return it to us by fax, or supply us with a signed copy of your purchase order or contract, issued by the party responsible for payment.

These prices will remain in effect for 90 days from date quoted.

Thank you for the opportunity to be of service on this project. If you have any questions or require additional information please call me at 973-242-3800.

Dennis Spearnock

Ed Zamiskie

Date

RARITAN BRIDGE - NEW YORK & LONG BRANCH RAILROAD

Laboratory testing cost for Soil and Rock samples:

Test Description	Unit Cost	Unit	No of Test	Amount	Remark (Total nos. SPT boring = 86 Approx.)
Visual Description and Identification of Soil	\$15.0	Per Sample	40	\$600.0	
Water (Moisture) Content of Soil	\$7.5	Per test	172	\$1,290.0	Two test per boring
Organic Content	\$35.0	Per test	33	\$1,155.0	Three test per approach boring (11 SPT)
pH of Soil	\$30.0	Per test	172	\$5,160.0	Two test per boring
Specific Gravity of Soil	\$80.0	Per test	86	\$6,880.0	One test per boring
Soil Chemical Analysis	\$135.0	Per test	86	\$11,610.0	One test per boring
Atterberg Limits	\$95.0	Per test	258	\$24,510.0	Three test per boring
Sieve Analysis	\$60.0	Per test	430	\$25,800.0	Five test per boring
Hydrometer Analysis	\$80.0	Per test	172	\$13,760.0	Two test per boring
Soil Resistivity	\$55.0	Per test	172	\$9,460.0	Two test per boring
Undisturbed Tube Sample Extrusion Only	\$30.0	Per Tube	86	\$2,580.0	One test per boring
Consolidated Isotropically Undrained (Bridge)	\$950.0	Per test	38	\$36,100.0	One test per substructure unit
Consolidated Isotropically Undrained (Approach fill)	\$950.0	Per test	11	\$10,450.0	One test per approach boring (11 SPT)
Unconfined Compressive Strength- Rock	\$195.0	Per Test	150	\$29,250.0	Two test per bridge boring (75 SPT)
Point Load Strength	\$125.0	Per Test	75	\$9,375.0	One test per bridge boring (75 SPT)
Moh's Hardness	\$25.0	Per Test	225	\$5,625.0	Three test per bridge boring (75 SPT)
Conventional One-Dimensional Consolidation	\$525.0	Per Test	11	\$5,775.0	One test per approach boring (11 SPT)

 Total:
 \$199,380

 Say
 \$200,000

Expense Backup: Geophisical Survey



Aqua Survey, Inc. 469 Point Breeze Road

Flemington, New Jersey 08822

908-788-8700 T 908-788-9165 F

Dolce @aquasurvey.com

То	EDWARD ZAMISKIE	From	Tom Dolce
Group Location			Vice President
Email Phone Cell	<u>ezamiskie@halevaldrich.com</u> (973) 658-3909 (973) 713-4045	Date	April 6, 2015
Project	Geophysical & Bathymetric Survey Raritan River	Proposal	GEO-040815-159

Thank you for your interest in Aqua Survey's capabilities and your request for a quote to perform survey services in the Raritan River in New Jersey.



Experience, Vessels & Equipment: Since 1975 Aqua Survey, Inc. (ASI) has been providing vessel-based sampling and surveying services throughout the United States and the Caribbean as well as internationally. Aqua Survey's vessels are configured and

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equipped to safely provide all the requested support identified in your request for a cost proposal. All of ASI's personnel are OSHA Hazwoper 40-hour trained. Aqua Survey places safety at the top of our company's objectives. Aqua Survey currently owns and operates the vessels and equipment and has the well-seasoned professional staff of degreed mariners to make your project a success.

Aqua Survey owns and operates over 20 sampling and surveying research vessels ranging in size and function from a four-person amphibious vehicle, to various sized jon boats, to geophysical survey vessels, to our 30-foot landing-craft coring and surveying boat to our latest acquisition, the 34-foot pontoon the R/V Edison. Having a fleet of vessels in-house allows Aqua Survey to deploy the right vessel for vastly differing river and lake conditions. Aqua Survey maintains appropriate levels of insurance for all vessels and onwater activities, operates all vessels in full compliance with United States Coast Guard rules and regulations and in compliance with the Jones Act. All vessels, at a minimum, are equipped with safety equipment for all crew members and passengers (clients). All captains are U.S. Coast Guard Licensed operators. We propose to commit an appropriately sized and equipped vessel to perform geophysical and bathymetric surveying in the Raritan River at the NJ Transit Bridge.

Bathymetric Survey

Aqua Survey will mobilize, deploy and demobilize a survey boat, Odom CVM depth sounder, or equivalent, DGPS precision positioning equipment and survey crew to your project sites to perform a bathymetric survey. Using lanes spaced 25 feet apart, Aqua Survey will run the appropriate number of track lines 1,000 feet east and west of the bridge across the main stem of the channel where the current swing bridge is located. ASI will run survey lines across the entire width of the river to get adequate coverage for this survey. Aqua Survey will use Hypack for survey control, ship track recording, and data acquisition. Depth measurements will be corrected to mean low water (MLW) as a vertical datum unless told otherwise.

Deliverables: Data will be processed and survey map produced as E-size drawings and on a CD-ROM as both an Auto-CAD and/or ASCII version file. The data reduction and mapping work will be completed within one work of the completion of the fieldwork.

Side-Scan Sonar Survey

An Edgetech 4125 dual frequency (400kHz/900kHz) side-scan sonar system will be used for this survey. Range scale will be set to no greater than 165 feet, with approximately 50 foot spacing for lines run parallel with the flow of the river. That will result in greater than 300 percent coverage of the riverbed. During the survey, the sonar will be constantly monitored and tuned to ensure the highest quality records possible are recorded. Positioning data from the DGPS will be collected and electronically paired with the side-scan sonar records to allow the location of targets to be determined during the survey and during post-processing. Following the survey, the individual records will be analyzed to detect the current status of the rip rap near the bridge and pier structures and any other debris or submerged objects. Any such targets will be noted, coordinates provided and target files created with data for each target annotated.

Magnetometer Survey

A magnetometer survey will be conducted in order to detect the presence of the buried cable utilities. The survey methodology is designed to provide data indicating the position, and relative size of ferrous targets in the survey area.

Aqua Survey will use their Geometrics G-882 marine cesium magnetometer. The survey will be conducted in order to detect and locate potential utilities crossing in the X and Y plane. The survey methodology will be designed to provide data indicating the position of any utilities in the survey areas within ± 3 feet. ASI will not be able to determine burial depth for the cables with any certainty. Survey lines will be run longitudinally along the river at 50-foot intervals to ensure complete coverage of the survey area. During the survey, the sensor will be towed at several different depths to get as near the bottom as possible and to ensure the sensors were not detecting the vessel itself. Data will be recorded at no greater than 0.5-second intervals and electronically paired with positioning data from the DPGS system in an onboard computer running Hypack survey software. To ensure reliable target identification and assessment, analysis of the magnetic data will be carried out as it is generated. Significant magnetic anomalies will be marked as targets during the survey and will be re-surveyed using the magnetometer to better determine the size and characteristics of the anomaly. Fiber optic cables maybe hard to detect with the magnetometers unless they are encased in metallic piping or similar casing.

Post-processing of the data will involve examining each survey line individually and annotating anomalies detected. Using contouring software, magnetic data generated during the survey will also be contour plotted at 10 gamma intervals for analysis and accurate location of the material generating each magnetic anomaly as well as determining the presence of clusters of targets. Magnetic targets will be isolated and analyzed in accordance with intensity, duration, aerial extent and signature characteristics.

We are estimating three days of field surveying to complete the on-water work and a week to complete all the data reduction and reporting.

ASI's pricing follows:

Mob/Demob	\$ 1,800 Lump Sum
Survey Field Work (\$ 4,200 Per Day)	\$12,600 Lump Sum
Data Processing and Summary Report	\$ 1,750 Lump Sum

Total Cost -

\$16,150

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Payment: Payment terms are Net 30 days from date of invoice.

Scheduling and Authorization: Please read the following Terms and Conditions, they will govern ASI's contractual relationship with you the Client. ASI must receive written authorization from the Client to schedule a project.

Terms and Conditions:

If you feel our policies may not be appropriate for your project, please let us know and we will do what we can to work with your request.

- 1. Client The public body or authority, corporation, association, firm or person with whom Aqua Survey, Inc. has entered into Agreement for the provision of services.
- 2. ASI Aqua Survey, Inc. with corporate offices at 469 Point Breeze Road, Flemington, New Jersey 08822 is the corporation retained to provide services as stated in this Agreement.
- 3. Point-of-Refusal Point-of-refusal is the point at which applied coring technology can no longer penetrate the target material at a reasonable rate. This may be caused by a variety of conditions including: rock, large stones, gravel, debris or other barriers.
- Right of Entry The Client will provide for right of entry of employees, agents, or subcontractors of ASI to perform and complete work that is subject of this Agreement.
- 5. Indemnity The Client will provide ASI information regarding the specific locations of all known underground manmade-structures and utilities. ASI will indemnify the Client from damages caused by ASI during the provision of services to these identified structures and utilities. ASI shall not be responsible and shall be held harmless by the Client for damages to any structure or utility not identified by the Client.
- 6. Mob/Demob Mobilization/Demobilization is the time period, work and costs associated with the mobilization of personnel and equipment to Client's work site and the demobilization of equipment and personnel from the work site after the conclusion of provision of services.
- 7. Day Rate ASI's day rate takes effect at the time ASI equipment and personnel have arrived at the work site. The length of the work day governed by the day rate is 8-hours unless otherwise specified to in the Agreement. Time over the agreed-to work period during a day will be billed on a prorated basis. Day Rate will be billed for on-site required training.

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- 8. Weather Day A weather day is a day that weather conditions make the provision of services unsafe or the likelihood of productivity unacceptably low. A weather day is declared by ASI's field team leader after consultation with Client. Weather Days will be billed at full day rate. Only one weather day per site has been allowed for.
- 9. Client-Directed Standby Time After mobilization has been completed and ASI is ready to enter the work site, has entered the work site or has commenced work, a prorated day rate will be billed for up to 8 hours for all Client directed standby time including, but not limited to, lockout, shutdown, labor actions, etc. This rate will also prevail for time spent at work site after the provision of field services has been completed and ASI personnel and equipment are not allowed to leave the work site to begin demobilization. A full day rate will be billed for scheduled work days that are cancelled without at least 96-hours advance warning.
- 10. All pricing is based on OSHA level "D" safety protection unless otherwise specified in the Agreement. Work requiring a higher level of personal protective equipment and not specified in the Agreement is subject to additional charges.
- Insurance Coverage ASI carries normal and customary insurance coverage and limits and will provide an insurance certificate upon Client's request. Any additional coverage or increased limits requested/required by Client will be billed at cost plus 15%.
- 12. Vessel/Equipment at Risk Notification If ASI is requested to operate vessels or equipment in high risk areas (e.g., over a collapsed/submerged pier) or under conditions that pose much greater wear and tear on the vessels and equipment than normal (e.g., ice flow conditions), the vessel's U.S.C.G. licensed captain will determine if the vessel or equipment is at risk, the captain will place Client on notice: Client is at risk and becomes liable for the repair or replacement of equipment that may be damaged if ASI continues to provide services in accordance with the Agreement in such declared areas.
- 13. The use of markout services and of geophysical equipment to detect submerged or embedded utilities lessens the probability of damaging such utilities but does not eliminate the possibility of Aqua Survey's equipment damaging utilities. ASI makes no claims the use of geophysical survey equipment will locate all unseen utilities.
- 14. Additional Services The rates included in the Agreement are for the services specified. Additional administrative work that may be required will be billed at \$125 per hour.
- 15. Line item prices are not offered on an ala carte basis. ASI prices/discounts projects keeping in mind all of the tasks being requested, not each one individually. Additional fees may be applied if the Client does not select the full suite of services offered in this proposal (unless that service is labeled "optional").
- 16. Payment Terms Your price schedule is based on a Net 30 day terms of payment. For longer than 30 days or for other alternative payment plans, Aqua Survey reserves the right to increase the cost of services. Alternative plans must be approved in writing by ASI.

17. Invoicing – Whenever a vessel is to be mobilized for a Client's project, Aqua Survey will invoice the Client the Mobilization/Demobilization fee when the project is authorized and scheduled. Additional invoices will be issued at project milestones or agreed upon billing cycles.

Understood and Accepted:

Edward Zamiskie - Haley & Aldrich, Inc.

Date

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