David Severns, PE

Mobile: 775-790-0681
Email: dave.severns@severnscivil.com

5325 SW 10th Ave
Cape Coral, FL 33914

Career Summary

David (Dave) Severns is an accomplished bridge engineer with more than 34 years of experience in bridge inspection program development, management and administration, above water and underwater bridge inspection, structural and scour analysis, and quality control/quality assurance. Dave is experienced in all aspects of comprehensive bridge inspection programs, including policy development, asset management and programming, rehabilitation/replacement planning, development of inspection manuals and training programs, state and federal code adherence, over-dimensional permitting and load restriction posting, bridge scour analysis, and quality control/quality assurance. Dave's career includes more than 20 years with Nevada Department of Transportation, serving as the State Bridge Program Manager. His career also includes serving as a transportation engineer with the FHWA. He has written/developed numerous bridge inspection manuals and training programs for AASHTO, FHWA, and NHI, participated in numerous State DOT bridge program performance audits, including NBI data quality reviews, conducted bridge inspection training programs both inside the US and internationally, and worked with FHWA to develop the "23 Metrics" of bridge program compliance, currently in use throughout the United States.

Dave is also a formally trained commercial diver, possessing Association of Diving Contractors International (ADCI) Mixed Gas Diving Supervisor Certification, and has extensive experience in offshore, coastal, and inland environments. His career includes serving as a member of the ADCI Board of Directors, and Chairman of the ADCI Engineering Diving Committee, and has twice been awarded the ADCI President's Award for his accomplishments in advancing engineering diving within the commercial diving industry.

Qualifications/Memberships

- University of South Florida, Bachelor of Science, Geology, Tampa, Florida, 1983
- State of Nevada Civil Engineering Program, Graduate, Carson City, NV, 1997
- Association of Diving Contractors International, Surface-Supplied Air Diving Supervisor
- Association of Commercial Diving Educators, Commercial Diver
- Professional Engineer – #19149, State of Hawaii; #1657-F, US Virgin Islands; #13969, State of Nevada
- American Association State Highway and Transportation Officials, National Bridge Inspection Task Force Member
- U.S. Department of Transportation, Federal Highway Administration, Policy Development Team Member

Project Experience

Underwater Inspections

FHWA Eastern Federal Lands Underwater Bridge Inspections, QA/QC Manager and Underwater Bridge Inspection Team Member, 2015-2016

Responsible for QA field reviews, QC checks on project deliverables, as well as field structural and scour inspections of select National Park Service bridges for the Eastern Federal Lands Highway Division of FHWA. Inspections range from high elevation bridges in Yellowstone and Yosemite National Parks during Spring runoff conditions, to alligator-inhabited, swamp conditions in Big Cypress National Preserve in Florida. Deliverables include Underwater Bridge Inspection Reports, Streambed Profiles, and Critical Findings.

Canadian National Railway Underwater Bridge Inspections, QA/QC Engineer, 2016-2018

Performed QA reviews and QC checks of project deliverables for underwater inspections of 37 bridges in Minnesota, Wisconsin, Illinois, Michigan, Iowa, Pennsylvania, Louisiana, and Mississippi.

Nottoway Reservoir Dam Inspection, Virginia Department of Military Affairs, Underwater Inspection Team Leader; Lead Acoustic Imaging Engineer, 2018

Led the underwater inspection effort, including the structural inspection of submerged portions of the dam, spillway, and pumphouse components, as well as a hydraulic/scour evaluation of adjacent upstream and downstream waterways, using both inspection divers and underwater acoustic imaging techniques. The diving inspection included Level I and Level II visual/tactile inspection methods, while the acoustic imaging inspection utilized high resolution scanning sonar, to identify structural deficiencies, and determine waterway bottom morphology adjacent to the dam. The acoustic imagine inspection supplemented the diving inspection, to confirm the extent of local scour, drift/debris accumulations, location of submerged utilities, and the adequacy of historical scour countermeasures.

Old Highway 80 Bridge Inspection, Vicksburg Bridge Commission, Underwater Inspection Team Leader; Lead Acoustic Imaging Engineer, 2017

Led the underwater inspection of this railroad bridge, crossing a deep and turbulent portion of the Mississippi River, where inspection using only divers has proven historically difficult. The submerged portions of the bridge substructure, as well as the adjacent channel bottom, were evaluated using high resolution scanning sonar, to identify structural conditions as well as the river bottom morphology under the bridge, detecting scour and drift/debris accumulations in water depths to 80 feet deep. The deliverables included a comparison of new-versus- historical profile data revealing long-term degradation, as well as significant foundation exposure above the river bottom, and concentrations of rubble, construction-related debris, and timber drift adjacent to the piers, which had not been accurately identified in previous inspection efforts.

Underwater Waterfront Facility Inspections, U.S. Naval Facilities Engineering Service Center, QA/QC Manager, 2016

Responsible for QA reviews and QC checks of project deliverables for various military waterfront facility inspections. Underwater inspections include visual inspection, non-destructive testing of steel components, coring of timber and concrete components, and documentation using underwater photography and video.

Minnesota NBI Underwater Bridge Inspections, Parsons Brinckerhoff Quade & Douglas Inc., Project Manager; Inspection Team Leader, 1993

Conducted and managed the underwater diving inspections of approximately 40 bridges throughout the state. Inspections were conducted using surface-supplied air diving equipment, and included condition rating, quantity determination, repair strategy development and recommendations.

Florida NBI Routine and Underwater Bridge Inspections, Parsons Brinckerhoff Quade & Douglas Inc., Bridge Inspection Team Leader, 1989-1992

Conducted NBI above and below water Routine Inspections of approximately 1800 bridges throughout the FDOT District 4, during a 4-year period. Inspections included fixed and movable bridges and were often conducted using aerial access equipment (Routine inspections) or SCUBA and surface-supplied air diving equipment (Underwater inspections), and included condition rating, quantity determination, repair strategy development and recommendations, and calculation of load ratings and bridge scour evaluations. Bridges were constructed of timber, conventionally-reinforced and pre-stressed concrete, and steel, with significant variation in age and geometrics.

Florida NBI Underwater Bridge Inspections, Districts 1 and 7, Florida Department of Transportation, Bridge Inspector, 1986-1989

Conducted NBI underwater diving inspections of approximately 1800 state-owned bridges within FDOT Districts 1 and 7, including condition rating, report processing and repair/rehabilitation quantity determination. Inspections consisted of CEI, Inventory, Routine, In-Depth, Emergency and Special inspection types, using SCUBA and surface-supplied air diving equipment.

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Sunshine Skyway Bridge Underwater CEI and NBI Inventory Inspection, Districts 1 and 7, Florida Department of Transportation, Bridge Inspector, 1986-1988

Provided underwater construction inspection and initial Inventory inspection of this signature cable-stayed bridge, including condition assessment, report preparation, and repair strategy determination. Diving operations were conducted using SCUBA and surface-supplied air diving equipment.

South Dakota NBI Underwater Bridge Inspections, Parsons Brinckerhoff Quade & Douglas Inc., Project Manager; Inspection Team Leader, 1992

Conducted and managed the underwater diving inspections of approximately 50 bridges throughout the state. Inspections were conducted on timber, concrete, and steel bridges, using surface-supplied air diving equipment, and included condition rating, quantity determination, repair strategy development and recommendations.

Utah NBI Underwater Bridge Inspections, Parsons Brinckerhoff Quade & Douglas Inc., Project Manager; Inspection Team Leader, 1992

Conducted and managed the underwater diving inspections of approximately 100 bridges throughout the state during winter months, often in harsh hydraulic conditions. Inspections were conducted on timber, concrete, and steel structures using surface-supplied air diving equipment, and included condition rating, quantity determination, repair strategy development and recommendations.

Utah NBI Underwater Bridge Inspections, Parsons Brinckerhoff Quade & Douglas Inc., Project Manager; Inspection Team Leader, 1994

As a repeat contract to a similar project in 1992, the project included the conduct and management of underwater diving inspections of approximately 100 bridges throughout the state, during winter months. Inspections were conducted using surface-supplied air diving equipment, and included condition rating, quantity determination, repair strategy development and recommendations.

Nevada NBI Underwater Bridge Inspections, Parsons Brinckerhoff Quade & Douglas Inc., Project Manager; Inspection Team Leader, 1994

Conducted and managed the underwater diving inspections of approximately 70 bridges throughout the state. Inspections were conducted using surface-supplied air diving equipment, and included condition rating, quantity determination, repair strategy development and recommendations. This constituted the first round of NBI underwater diving inspections ever done in the State of Nevada, and the project resulted in two bridges being closed due to critical deficiencies being identified during the inspections.

Georgia Emergency Underwater Bridge Inspections, Georgia Department of Transportation, Project Manager; Inspection Team Leader, 1994

Conducted and managed emergency underwater diving inspections, including QC functions, on approximately 40 bridges in central Georgia, immediately following flooding of the area. Several bridges determined to exhibit critical damage and were closed and removed from service.

Buckman Bridge Underwater CEI, Parsons Brinckerhoff Quade & Douglas Inc., Bridge Inspection Team Leader, 1994-1995

Underwater construction inspection was conducted during the widening construction of the 3.1-mile-long Buckman Bridge, carrying Interstate 295 over the St. Johns River near Jacksonville, Florida. Inspection work included condition assessment, repair strategy determination and report preparation. Diving operations were conducted using surface-supplied air diving equipment.

Pennsylvania Turnpike NBI Underwater Bridge Inspections, Parsons Brinckerhoff Quade & Douglas Inc., Project Manager; Inspection Team Leader, 1990

Conducted and managed the underwater diving inspections of approximately 60 bridges throughout the Pennsylvania Turnpike (including the Northeast extension). Inspections were conducted using surface-supplied air diving equipment,

and included condition rating, quantity determination, repair strategy development and recommendations. Several bridges inspected during severe hydraulic condition, including Monongahela River bridges at flood stage, and Pocono River bridges experiencing runoff in mountainous terrain.

New Jersey DOT Underwater Bridge Inspections, QC Manager, 2015-2016

Responsible for QC checks of deliverables for bridges inspected throughout New Jersey, for this on-call project. Inspections are led by a NJ PE- diver and performed in accordance with NBIS and NJDOT Guidelines Manual for Underwater Inspection and Evaluation, and have resulted in Critical Inspection Finding determinations.

Nevada NBI Underwater Bridge Inspections, Nevada Department of Transportation, Project Manager; Inspection Team Leader, 1995 - 2014

Conducted and managed underwater diving inspections of approximately 400 bridges throughout the state. Inspections were conducted using surface-supplied air and Commercial SCUBA diving equipment, and included condition rating, Element Level inspection, quantity determination, repair strategy development and recommendations.

NYCDOT Ferry Transfer Bridges On-Call for Inspection & Design Services, QC Manager, 2015-2016

Responsible for QC checks of deliverables for underwater bridge inspection services of NYCDOT Ferry Transfer Bridges, as part of the $4M/year NYCDOT Ferry Shore Facilities Inspection, Design, and Resident Engineering On-Call Services contract. Inspections are performed in accordance with NBIS and NYSDOT requirements.

KYTC Statewide NBIS Routine and Special Bridge Inspections, Bridge Inspection Team Leader, 2015

Conducted Condition Rating and Element Level inspections of bridges throughout KYTC Districts 3 and 7, including Routine inspections as well as Special inspections of severely deteriorated bridges with reduced inspection frequencies. Inspections included both above and below water component inspection, as well as scour evaluation.

Norfolk Southern Underwater Bridge Inspections, QA/QC Manager; Engineer-Diver, 2017-2018

This project included more than 95 Level I, II and III underwater bridge inspections for the Norfolk Southern Railroad Corporation at various locations across the eastern and southeastern United States. Inspections included water conditions consisting of zero visibility, heavy current and heavy debris. Used surface-supplied air (SSA) and Commercial SCUBA dive equipment, diving platforms, imaging sonar and sounding equipment and other specialized equipment for these inspections.

Statewide Underwater Bridge Inspection, Kentucky Transportation Cabinet, QA/QC Manager; Engineer-Diver; Dive Supervisor, 2017-Present

As part of the team, Dave brings extensive experience in providing underwater inspection services to KYTC. His work encompasses major bridges over the Ohio and Tennessee Rivers. These inspections included reinforced concrete bridge piers, bents, and abutments, steel bent columns, corrugated steel culverts, and reinforced concrete box culverts. Dave serves as bridge inspection team leader and QA/QC engineer for NBIS Routine and Underwater bridge safety inspections, involving conducting NBIS routine and underwater inspections, including collecting element-level data, and preparing reports using AASHTO's Bridge Management Software (BrM). Bridges and culverts exceeding 20 feet in length are inspected, including bridges requiring special access techniques. Stantec has inspected 275 +/- structures above water in four different KYTC Districts, and multiple bridges underwater.

Bridge Inspection

KYTC Statewide Fracture Critical Bridge Inspections, Bridge Inspection Team Leader, 2014-2015

Conducted NBI and Element Level inspection of the deck, approach spans, and main truss lower chords of the Henderson, KY bridge over the Ohio River, including report preparation.

Colorado NBI Bridge Inspections, Bridge Inspection QC Engineer, 2014

Responsible for the QC evaluation of 52 bridge inspection reports for structures located in metropolitan Denver, including NBI and Element Level inspection.

Colowyo Mine Bridge Inspections, Bridge Inspection QC Engineer, 2014

Responsible for QC evaluations of in-depth inspection of two, privately owned railroad bridges exhibiting significant deterioration.

Bridge Inspection, Assessment and Rehabilitation

Nevada NBI Bridge Inspections, Nevada Department of Transportation, Bridge Engineer; Inspection Team Leader, 1995-1999

Conducted NBI Inventory, Biennial Routine, In-Depth, Damage and Special inspections of approximately 1,800 state and locally-owned bridges throughout Nevada. Work consisted of condition assessment, condition rating, element level inspection and rating, repair/rehabilitation strategy development, load rating calculations, and date entry and QA/QC, using the PONTIS Bridge Management System.

AASHTO Subcommittee on Bridges and Structures, T-18 Committee, Principal Author, 2014

Re-write of the Manual for Bridge Evaluation, Section 4 – Inspection Procedures. Tasked with updating Section 4 of the MBE, to incorporate best inspection practices into the Manual, as well as to incorporate by reference the training techniques contained within FHWA Bridge Inspector's Reference Manual. This effort fundamentally changed this section of the MBE, enhancing its value to bridge owners by incorporating best practice information not found elsewhere in the literature, and by eliminating redundant information also found within the BIRM.

Bridge Inspection Training

Manual Development for FHWA Bridge Inspector's Training Manual 90, Principal Author, 1990-1994

Principal author of chapter on Underwater Bridge Inspection.

Manual Development for FHWA Bridge Inspector's Reference Manual (BIRM), Publication No. FHWA NHI 12-049, Principal Author, 2002-2006

Principal author of chapters on Underwater Inspection and Inspection of Waterways, as contained within the 2002 Manual and 2006 revision.

Development of Training Courses Underwater Bridge Inspection and Underwater Repair, Rehabilitation and Countermeasures (NHI 130091/13091A), National Highway Institute, Federal Training Course Developer, 2005-2006

Worked along-side members of FHWA and NHI, to develop training courses and materials. Included evaluation and critique of Pilot training courses, taught by consultant staff.

NHI Underwater Bridge Inspection Webinar; National Highway Institute, Seminar Presenter, 2010

Developed and presented training entitled "Commercial Diving Standards in Relation to Underwater Bridge Inspection".

Comprehensive Bridge Inspection Training Program Development and Training, Republic of Trinidad and Tobago Ministry of Works and Infrastructure, Training Program Developer; Instructor, 2013

Work included development of a formal bridge inspection training program, for use by bridge engineers and technicians working throughout the country. The project included the promulgation of written training materials, as well as the performance of all classroom and field training.

Nevada Bridge Elements Coding Guide, Nevada Department of Transportation, Project Administrator/Developer, 2013

Development of a very comprehensive guide manual for use by bridge inspection engineers to conduct element-level bridge inspections throughout Nevada. Project also included training of in-house and consultant engineers in its use. This exhaustive manual far exceeds Federal requirements and includes a comprehensive set of Agency Developed Elements for the bridge, approaches, and waterway features, as well federally-mandated National Bridge Elements and Bridge Management Elements.

Development of State of Nevada Bridge Inspection Refresher Training Program, Nevada Department of Transportation, Program Developer, 2014

Developed a Bridge Inspection Refresher Training program conducted in-house, which met all FHWA training requirements per 23CFR650 - National Bridge Inspection Standards. This training is held annually and is offered to in-house staff as well as consultant inspection personnel working in Nevada.

Revision of the National Bridge Inspection Program Compliance Review (23 Metrics) Process, FHWA Policy Development Team Member; Federal AASHTO National Bridge Inspection Task Force Member, 2012-2014

Served as a Task Force member on this 2-year project, to solicit and evaluate commentary from States and FHWA Division Bridge Engineers regarding existing Compliance Review processes, and to develop and implement short, intermediate and long-term strategic changes to improve the process.

Bridge Quality Assurance

QC Reviews for Statewide Bridge Inventory, Nevada Department of Transportation, Quality Control/Quality Assurance Reviewer, 2016-Present

Routinely conducting QC reviews of project deliverables for this statewide bridge inventory and inspection project. Structure types inspected on this project range from small box culverts to complex, signature bridges, such as the O'Callaghan-Tillman (Hover Dam) Bridge over the Colorado River.

South Florida Regional Transportation Authority Bridge Inspection and Engineering Support, QA/QC Manager; Engineer-Diver; Dive Supervisor , 2014-Present

Currently performing full service railway bridge inspection and engineering services to the SFRTA for a ten-year period, in an 80-mile service area extending between Miami and West Palm Beach, Florida. Services include bridge inspection and engineering assistance on all bridges within the service area, including annual above water and underwater structural and scour inspections per Federal Railroad Administration (FRA) requirements. Deliverables include development of comprehensive bridge inspection reports (designed by Stantec inspection engineers), which include repair recommendations as well as inspection findings, as well as updating of the client Bridge Management Program (BMP).

Design of Pedestrian Suspension Bridges; Bridging the Gap, Bridge Design Engineer, 2012-2013

Pro-Bono work, including design of suspension foot bridges meeting AASHTO pedestrian loading requirements, for construction in remote areas of Kenya.

Post Earthquake Emergency Inspection Management Nevada, Nevada Department of Transportation, Project Manager, 2006

Managed the emergency inspection and reporting for inspection of several dozen bridges in northwest Nevada, resulting from a 6.0 Magnitude earthquake event. Inspections commenced within 24 hours of the event.

Post-Fire Emergency Inspections, Nevada Department of Transportation/USFS Joint Effort, Project Manager/Inspection Team Leader, 2004

Conducted and managed emergency inspection and reporting, including QC/QA functions, on several dozen US Forest Service-owned bridges in northwest Nevada, resulting from large lightening-induced fires in the area. Inspections commenced within 24 hours of the event and were conducted to support USFS.

Preliminary Damage Assessment (PDA) Inspections, Nevada Division of Emergency Management, Inspection Team Leader, 1997

Assigned to the Nevada PDA Team as the sole structures engineer, provided forensic evaluation and damage assessment on bridges and structures, statewide, following a 100+ year flood event which affected several hundred bridges, as well as local-government and Bureau of Indian Affairs-owned structures throughout northwestern Nevada. Duties included preliminary damage assessment, damage quantification and cost assessment, working directly with FEMA.

NBIS QA/QC and CIF Inspections, Nevada Department of Transportation, Bridge Inspection QC/QA Engineer, 1999-2007

Responsible for QC over inspection deliverables as well as the conduct and reporting of QA Audit inspections of all in-house and consultant engineers conducting NBI Condition Rating and Element Level bridge inspections in Nevada. Also, responsible for the conduct and reporting of Critical Inspection Finding (CIF) inspections, including notification of bridge owners and FHWA officials, per NDOT policy.

Other Structural Inspection

Belize Shipping Pier Rehabilitation, Parsons Brinckerhoff Quade & Douglas Inc., Inspection Team Leader, 1990

Project included the above and below water rehabilitation inspection of the approximately 1,000-foot- long shipping pier servicing the country of Belize. The pier was found to exhibit severe deterioration of the deck and superstructure, as well as significant vessel impact damage in the columns. Inspection report findings were used to develop repair/rehabilitation cost estimates and design drawings.

Signage and Lighting Structure Inspections

Hurricane Andrew Emergency Inspections, Florida Department of Transportation, Project Manager; Inspection Team Leader, 1992

Emergency structural inspection of several hundred bridges and sign/signal/hi-mast lighting structures, immediately following Hurricane Andrew in South Florida. Many inspections occurred within hours of the event, and many involving climbing of sign structures over live traffic.

Signage and Lighting Structure Design

Sign/Signal/Hi-Mast Sign Structure Inspections, Nevada Department of Transportation, Project Manager, 2004

Project Manager over the inspection of over 4,000 sign/signal/high-mast lighting structures throughout Nevada, including visual and NDT evaluation methods. Work included the development and implementation of a comprehensive, computerized sign/signal/hi-mast lighting structure management system.

Tunnels

Nevada Tunnel Inspections, Nevada Department of Transportation, Project Manager/Inspection Team Leader, 1995-2007

Conducted structural Condition Rating and/or Element Level inspections of all rock and lined tunnels throughout Nevada, using in-house developed reporting forms/software. All tunnels were inspected on a 24-month inspection frequency.

Technical Program - Development and Training

Nevada NBI Program Management, Nevada Department of Transportation, Principal Bridge Engineer, 1999-2007

Responsible for management of Nevada's Bridge Program, including coordination with federal government, state agency, and local government officials; staff supervision, training, and development; QA/QC of inspection deliverables; conduct of QA Audit, Emergency Response, and Critical Inspection Finding (CIF) inspections; and Bridge Program development. Also, responsible for managing data within the PONTIS Bridge Management System.

Nevada NBI Program Development and Administration, Nevada Department of Transportation, Assistant Chief Structures Engineer, 2007-2014

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Responsible for administering all aspects of Nevada's Bridge Program, including: Program development; Program funding; Development of 3-yr and 5-yr bridge rehabilitation/replacement planning, STIP/TIP programming, etc.; Bridge Management System development and implementation; State inspection policy development and implementation; Element-level inspection policy, guide manual, and training development and implementation; Transportation Asset Management Program development; Business Intelligence policy development; Policy development and implementation for over-dimensional vehicle routing and permitting, and bridge height and weight restriction posting; Relations with federal government, state agency, and local government officials; Staff hiring, discipline, and development; Consultant solicitation, hiring and performance monitoring; etc.

Database Management

Business Intelligence Plan Development, Nevada Department of Transportation, Program Developer, 2013-2014

Worked as a member of a multi-disciplinary team, to integrate information and data from various engineering disciplines into a singular, agency-wide asset management database.

Transportation Planning

Nevada Transportation Asset Management Plan, Nevada Department of Transportation, Program Developer, 2014

Worked as a member of a multi-disciplinary team, to develop an agency-wide Transportation Asset Management Plan (TAMP), satisfying MAP21 requirements.