

FIELD & TEST ENGINEERING, Inc.
ACCIDENT RECONSTRUCTION SPECIALISTS
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ROBERT F. DOUGLAS, P.E.

QUALIFIED IN SUPERIOR COURT TO TESTIFY ON:

Accident Reconstruction; Traffic Engineering; Roadway and Roadside Design and Construction; Off Road Safety; Human Factors Including Conspicuity & Low-Light Reconstruction; Roadway/Roadside Design; Construction and Maintenance; Highway/Rail Crossings; Wet Weather Accidents; Laser & Total Station Surveys & Mapping; Photo, Video, & Computer Reconstruction Simulations

SPECIALIZING IN

***Traffic/Transportation Engineering For Highways & Streets:**

Permanent and Work Zone Traffic Control / Traffic Signals / Signs / Striping / Parking & Off Road Facilities / Highway-Rail Crossings / New Technology Lighting / Crosswalk Lighting / Barriers including Guardrail / High Accident Locations / Speed Limits / Run-Off-Road Accidents / Ramp Metering / Wet Weather Accidents

***Design of Roadways, Highways, Streets & Off Road Facilities:**

Geometric Alignment / Hydraulics-Hydrology (Drainage and Drainage Structures) / Geotechnical (Soils/Bases –Failure Mechanisms) / Traffic Control Devices / Highway-Rail Crossings / Barriers / Sight Distance / Traffic Signals / Signs / Pavement Striping and Markings / Delineators / Asphalt Concrete (incl Mix Design) / Portland Cement (White) Concrete (Roadways, Bridges, Sidewalks, Curbs & Gutters) / Lighting / Wet Weather Skid Resistance.

***Roadside Design & Construction - Off Traveled-Way Environment:**

Clear Zone Requirements / Sidewalks / Parking Areas / Side Slopes / Obstacles (Natural or Designed) / Landscaping / Erosion Control / State Water Quality Standards (soil and pollutants on roads, roadsides, sidewalks & Off Road Facilities) / Barriers (including Guardrail) / Break-a-Way Bases & Poles / Lighting

***Roadway Construction and Maintenance:**

Work Zone Traffic Control Implementation / Movable & Temporary Traffic Signals / Traffic Control Plans / Adherence to Plans & Specifications / Constructability / Plan Continuity / Field/Plant/Laboratory Inspection and Testing of Soil, Aggregates and Asphaltic/Portland Cement Mixes for Roadways/Walkways/Parkways / Trenches, Potholes, Edge Drops on Roads, Streets, Parking Areas, Walkways and Crosswalks / OSHA

***Accident Reconstruction for Streets, Highways (Incl Highway-Rail Crossings):**

Including Computer Simulations / Visual Acuity / Perception/Reaction Time / Low-Light/Night-Time Photography / Skid Resistance / Slip, Trip and Fall Accidents / Locomotive, Consist & Highway-Rail Incidents

***Human Factors (Streets, Highways, Highway-Rail Crossings):**

Perception & Reaction to Roadway & Off Road Design including Parking Areas (PR Time Specialist) / Walking Areas / Traffic Control & Devices / Perilous Situations / 'Startle' / Visual Acuity / Conspicuity / Wet/Dry Road Human Behavior

***Wet Weather Accidents:**

Dry/Wet Road Friction/Wet "anti-skid" friction requirements on roadways / Full Scale Friction Testing of Roadways (ASTM Pavement Standards)

TECHNICAL PUBLICATIONS:

"Applications of the MUTCD 2000 in California" – Text for a professional training presentation on the use of the "Manual on Uniform Traffic Control Devices" and supplements from Caltrans which were adopted to replace the previously published Caltrans "Traffic Manual" in May of 2004.

"Manual on Uniform Traffic Control Devices" – As a technical member of the National Committee on Uniform Traffic Control Devices, contributed to/wrote/reviewed portions of the "Millennium" edition of the most important Traffic Engineering publication in the country. This has for years been a US Department of Transportation (FHWA) National Standard. All agency and or public accessible road/street facilities must be in substantial conformance to the standards in this document. In May, 2004, the 2003 edition, along with various California Supplements, became the new Caltrans "Traffic Manual."

"Traffic Control Devices Handbook" - Contributed to/reviewed portions of the 2001 edition of what is considered the second most important Traffic Engineering publication in the US. Published by the Institute of Transportation Engineers, Washington, D.C (2001), this was designed to be a professional guide for use of the "Manual on Uniform Traffic Control Devices."

TECHNICAL PUBLICATIONS (Cont'd):

“Professional Engineers Review Manual,” rewrote portions for the civil engineering registration review course - California State University, Long Beach, Civil Engineering Extension Office (1992).

“Manual on Preparation of Construction Contract Change Orders” - California Department of Transportation, District 12 (Orange County) (1989.) Manual for resident and senior resident engineers on preparation of Construction Contract Change Orders.

“State Construction Manual” ADOT (1988) Wrote/reviewed/revised major portions for the Arizona Department of Transportation.

“Computer Procedures and Technical Data” ADOT – Usage and Programming (1987) – Rewritten for the Arizona Department of Transportation, Construction Division.

TEACHING EXPERIENCE:

University of Southern California, Institute of Transportation Studies, Technology Transfer Program, Berkeley, **Applications for the MUTCD 2000 in California** – a course for California engineers on the MUTCD standards applicable to all public access roads as a part of the 2004 Caltrans Traffic Manual

California State University, Long Beach, **CE 426 Transportation Engineering** - upper level undergraduate engineering, and **Recent Advances in Transportation Engineering**, a graduate course.

American Traffic Safety Services Association - One of four “Tort Liability and Accident Reconstruction” panel members presenting at the “How to Improve Roadway Worker Safety” Conference, San Diego, 1994

California State University Civil Engineering Extension, Long Beach, **Professional Engineers Registration Review Course on Surveying** - Civil Engineer’s Registration Review including Horizontal Alignment & Surveys for Design and Construction, Mass Diagrams, Staking, Cut/Fill Sections, etc.

California Department of Transportation, **Traffic Control Device Design and Implementation** - course for both in-house traffic engineering personnel and outside consultant engineers on the design and use of traffic control devices; **Project Engineer Training Academy Facilitator**, roadway design engineer course, Sacramento; **Construction Contract Change Order Instructor** -Course for Senior/Associate Resident Engineers.

Arizona Department of Transportation, **Transportation Engineering Course** for Attorney General’s office (1987-1988); **Design and Construction - Roadways**, a course for local government street and highway engineers and technicians in Phoenix (1987); **Trenching for Underground Storm Drainage Systems**, (1986) – **Inspection/Design of Asphaltic Concrete Roadways**, a course for engineers and technicians on inspection and control of field and mix plant asphaltic concrete roadways, walkways, & parking facilities.

EDUCATION:

Bachelor of Science in Civil Engineering – (1971)

“Work Zone Traffic Control” – Federal Highway Administration/Arizona Department of Transportation (1986)

“Tort Liability in Streets and Highways” – Arizona State University (1987)

“Instructor’s Contract Change Orders” for District trainers of Resident and Senior Engineer – Caltrans (1989)

“Project Engineer’s Training Academy” – Caltrans – Transportation Design for Caltrans Engineers (1990)

“Fundamentals of Traffic Engineering” – Institute of Transportation Studies, Berkeley (1990)

“Leadership Through Total Management Involvement” – Resolution Training/Caltrans District 12 (1991)

“Federal Highway Administration (FHWA) Courses:

 “Roadside Design” – Design of Barriers, Railings, Slopes to Maximize Safety (1994 & 1996)

 “Construction Claims” - Avoidance or Resolution (1987 & 1990)

 “Geotechnical Fabrics and Their Usage” (1987)

 “Driven Pile Foundations” for Structures (1987)

“Workshop on Transportation Law” – Transportation Research Board – Madison, Wisconsin (1994)

“Texas A & M (World Reconstruction Exposition): Certificate in Collision Investigation and Reconstruction(36 CEU’s Co-sponsored by Accreditation Commission for Traffic Accident Reconstruction) (2000)

“Various Graduate Courses” - USC, UCLA, UCI

“PC CRASH & PC RECT Training Workshop” – MACINNES Engr – (2004 & In-House in 2005)

Psychological Methods - Presentation Skills - Walden University 2005

“Critical Thinking” - UC Berkeley Extension School of Psychology (July 2005-February 2006)

REGISTRATION:

Professional Engineer, California Number C44312
Professional Engineer, Arizona Number 20904

PROFESSIONAL EXPERIENCE:

Field & Test Engineering, Inc. - **Traffic and Roadway Safety Engineer** - Road and off-road accident reconstruction, traffic/transportation engineering, safety research and analysis (December 1999 to the Present).

Vollmer-Gray Engineering Laboratories - **Traffic and Roadway Safety Engineer** - Road and off-road accident reconstruction, traffic/transportation engineering, safety research and analysis (August 1994 to December 1999). Concurrently Arizona Department of Transportation, **Project Manager**, Intermodal Transportation Division (March 1996 to September 1998).

California Department of Transportation, Orange County - **District Traffic Engineer** – Branch Chief, Traffic Design unit, also lead Traffic Engineer for the District, Chairman of the District (Orange County) Safety Review Committee (reviewed every District roadway/roadside/parking project during design for safety elements prior to bid and again during construction “in the field” before final project acceptance) Concurrently Branch Chief, Hydraulics and Hydrology unit (November 1992 to July 1994); **Lead District Project Management Engineer** - responsible for delivery of a \$20 billion 10-year road/street/parking construction program (all) - also Headquarters Information Systems Task Force Member (April 1991 to November 1992); **Principal Assistant to the District Construction Engineer** - Provided first review and approval for Construction Contract Change Orders, and was Principal Assistant to District’s Chief Construction Engineer (June 1989 to April 1991).

ASL Consulting Engineers, Irvine, **Lead Transportation Engineer** - Responsible for Transportation design/construction for this consultant office (November 1988 to June 1989).

Arizona Department of Transportation, **Forensic Engineer**, Highways Division - Designated Tort Liability Engineer for the Highways Division, Liaison to the State Engineer and the Attorney General’s Office, accident reconstruction, expert testimony, road accident research and analysis (1988 to November 1988); **Field Review Engineer**, Operations Division - reviewed ongoing State construction projects for specification, traffic control, design (including safety) conformance (1987 to 1988); **Contracts and Specifications Contract Engineer** - Reviewed final plans composed specifications for various road projects (1986 to 1987); **Construction Area Supervisor** - Responsible for/Oversaw various roadway projects through individual Construction Project Engineers - Concurrently acting as the Federal Highways Administration Engineer for several Bridge Replacement Projects and major roadway realignment projects in the area. Area Instructor for Bituminous Concrete Plant, Field, and Materials Testing (Instruction from the Asphalt Institute’s Training Manuals;) also Instructor for Safe Trenching Construction Practices (OSHA Construction Manuals.) (1985 to 1986).

Viking Southwest, El Paso, TX, **Engineer Manager** - General design, construction and materials engineering and building consultants, surveyors and constructors (1972 - 1985).

Texas Department of Transportation, **District Design Engineer** - Design of Roadways and Appurtenances (1971-1972); Principal Assistant to District Asphaltic Concrete Engineer, lead “trouble-shooter” for plant, field and roadway Asphaltic Concrete construction and production for large West Texas District. One of two engineers certified to prepare Asphaltic Concrete Mix Designs for roadways throughout the District. Also provided Testing and Inspection for Portland (White) Concrete products (including Mix Designs for Bridges and appurtenances such as Curb and Gutter, etc.); Also oversaw and administered quality control standards & specifications for “base” and subbase materials (Soil and Aggregate Materials) (1968-1971).

New Mexico Highway and Transportation Department, Project Supervisor/Chief Inspector, Construction Projects throughout Northeastern New Mexico, to include major Freeway and Primary Roadway Construction; Lead Supervisor for all materials testing and acceptance, including all Asphaltic Concrete and Portland Cement (White) Concrete, and lead engineering surveyor (1964-1968).

TECHNICAL BACKGROUND:

Traffic Engineering: Traffic Control (Permanent or Maintenance/Construction) adequacy including traffic signals, pavement markers, signs, barriers, guardrails, traffic control plans; adequacy of wet weather road surface conditions; adequacy of highway-rail crossings.

Geometric Roadway Design: Alignment, curvature, banking, speed limits, sight distance, etc.

Road & Street Construction & Maintenance: All facets of construction and maintenance from overlays to major multi-lane freeway realignments; intimate knowledge of Asphaltic and Portland Cement Concrete quality control, testing and placement, as well as engineering surveying.

Roadside Design: Concrete barriers, guardrail, clearance to objects and "loosely" compacted side slopes (rail, trees, barriers, poles, inadequate slope compaction or "soft" side slopes.)

Human Factors: Perception and Reactions in the use of Transportation Facilities including roads/streets/walkways/parking areas; night time driving; human visual and tactile responses to varying road/vehicle/pedestrian conditions.

Dim Light/Night-time Photography: Photographic reconstruction of road/street/crosswalk/parking facilities.

PROFESSIONAL CERTIFICATIONS AND AFFILIATIONS:

NCUTCD (National Committee on Uniform Traffic Control Devices) - committee responsible for revising the USDOT/ANSI "Manual on Uniform Traffic Control Devices" that all States follow - Member of the Pedestrian Traffic Signal Sub-Committee, also Chair of the New Technology Traffic Signals subcommittee

National Committee Reviewer for the 2001 Traffic Control Devices Handbook.

ASTM (American Society for Testing and Materials) Member of Three Committees –
Committee on Vehicle - Pavement Systems (E17) and the Sub-committee (E17-21) that oversees the standard for wet weather friction testing for roadways - ASTM E-274 (AASHTO T-242).
Committee on 3D Imaging Systems (E57) - Committee that was formed to develop standards for the accuracy and use of scanners for surveys and imaging.
Committee on Pedestrian/Walkway Safety and Footwear (F13) Committee responsible for standards and measurements of the adequacy of walking surfaces and footwear.

HFES (Human Factors & Ergonomics Society) Technical Groups (Member): Aging; Augmented Cognition; Cognitive Engineering & Decision Making; Forensics Professional; Perception & Performance; Safety; Surface Transp.

NARSCI (National Association of Railroad Safety Consultants and Investigators) - Largest Independent National Rail Safety Organization - Member

APS (Association for Psychological Science) Life Member

TRB (Transportation Research Board) Member - Served on the "Tort Liability and Risk Management" Committee; subcommittee member of the "Traffic Control Devices Committee".

ITE (Institute of Transportation Engineers), Life Member - Educators, Expert Witnesses and Urban Traffic Engineers Council. Authored/reviewed sections in the ITE "Traffic Control Devices Handbook."

FHWA/ADOT – Tested/Certified - Work Zone Traffic Control Supervision/Design (40 Hour Course) (1988)

ASCE (American Society of Civil Engineers) Member

SAE (Society of Automotive Engineers) Member

ATSSA (American Traffic Safety Services Association) Member

IEEE (Institute of Electrical and Electronic Engineers) Member

CSULB - California State University, Long Beach, Board of Directors, Civil Engineering Department Professional Advisory Committee; Chair, Engineering Department's Development Committee.

California Department of Transportation - Headquarters Information Systems Task Force Member Head of Orange County delegates, developed computer based time sheet which has replaced "paper" in Caltrans.

Association of General Contractors / Arizona Transportation Department joint committee member.

Arizona Community College Board-certified Civil Engineering Instructor -1988.

Chi Epsilon - Honorary Academic Achievement Civil Engineering Fraternity.