

**FORM TECH-6 CURRICULUM VITAE (CV) FOR PROPOSED PROFESSIONAL STAFF**

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1. **Proposed Position:** Micro-Hydro Specialist, I-10

2. **Name of Firm** [*Insert name of firm proposing the staff*]: Hydrau-Tech, Inc. \_\_\_\_\_

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3. **Name of Staff:** Charles C. Hutton

4. **Date of Birth:** January 22, 1943                      **Nationality:** USA

5. **Education:**

Master of Science Civil Engineering, Emphasis on Structural Engineering, 1967, Purdue University, Indiana, USA

Bachelor of Science Civil Engineering, 1965, Purdue University, Indiana, USA

Graduate Studies in Water Resource Engineering, 1984-1987, University of Colorado

6. **Membership of Professional Associations:**

Professional Engineer:

Colorado (No. 17795), 1981

Puerto Rico (No. 19943), 2002

Wyoming (No. 10282), 2004

American Society of Civil Engineers

United States Society of Dams

Association of State Dam Safety Officials

7. **Other Training:**

- Dam Safety 2007, Four-Day Conference, Association of State Dam Safety Officials, September 9 to 12, 2007
- Dam Safety Performance Monitoring Program and Potential Failure Mode Analysis Workshop, 2-Day Training Course, Federal Energy Regulatory Commission, October 20 to 21, 2004.
- Dam Safety 2004, Four-Day Conference, Association of State Dam Safety Officials, September 26 to 30, 2004
- HydroVision 2004 – Best Practices, New Ideas, Opportunities, 4-Day Conference, American Society of Civil Engineers, August 16 to 20, 2004
- National Dam Safety Program Technical Workshop #11 – Addressing Hydrologic Inadequacy, 2-Day Training Course, Federal Emergency Management Agency Interagency Committee on Dam Safety, February 18 to 19, 2004
- Dam Safety 2003 Four-Day Conference Course, Association of State Dam Safety Officials, September 7 to 10, 2003

- Waterpower XIII – Advancing Technology for Sustainable Energy 3-Day Conference, American Society of Civil Engineers, July 29 to 31, 2003
- Risk Assessment Methodology for Dams (RAM-D<sup>SM</sup>) 5-Day Training Course, U.S. Army Corps of Engineers, November 18 to 22, 2002
- Dams – Innovations for Sustainable Water Resources 3-Day Lecture, U.S. Society of Dams, June 24 to 26, 2002
- Third U.S.-Japan Workshop on Advanced Research in Earthquake Engineering for Dams 2-Day Training Course, U.S. Society of Dams, June 22 to 23, 2002
- HydroVision 2002 – Issues, Solutions, New Approaches 4-Day Conference, American Society of Civil Engineers, July 10 to 14, 2002
- Dam Safety 2002 Four-Day Conference, Association of State Dam Safety Officials, September 8 to 11, 2002
- National Dam Safety Program Technical Workshop #9 – Responding to Dam Safety Emergencies 2-Day Training Course, Federal Emergency Management Agency Interagency Committee on Dam Safety, February 20 to 21, 2002
- The Future of Dams and Their Reservoirs 4-Day Lecture, U.S. Society of Dams, July 30 to Aug 3, 2001
- National Dam Safety Program Technical Workshop #8 – Inspection, Evaluation, Follow-up 2-Day Training Course, Interagency Committee on Dam Safety, February 21 to 23, 2001
- Dam O&M Issues – The Challenge of the 21<sup>st</sup> Century 4-Day Lecture, U.S. Committee on Large Dams, July 10 to 14, 2000
- National Dam Safety Program Technical Workshop #7 – Spillway Gates – A Critical Aspect of Dam Safety 2-Day Training Course, Interagency Committee on Dam Safety, February 23 to 24, 2000
- Tainter Gate Workshop 2-Day Training Course, Federal Energy Regulatory Commission and Electric Power Research Institute, October 26 to 27, 1999
- Dam Safety 1999 Three-Day Training Course, Association of State Dam Safety Officials, October 10 to 13, 1999
- Waterpower '99 – Hydropower's Future: Technology, Markets, and Policy 3-Day Training Course, American Society of Civil Engineers, July 6 to 9, 1999
- Dealing with Aging Dams 4-Day Training Course, U.S. Committee on Large Dams, May 17 to 21, 1999
- Project Manager Certification Program 2-Day Training Course, Frederic R. Harris, Inc., January 30 to 31 and February 20 to 21, 1998
- Roller Compacted Concrete III 3-Day Training Course, American Society of Civil Engineers, February 2 to 5, 1992
- Structural Repair of Concrete and Masonry 2-Day Training Course, American Society of Engineers, April 21 to 22, 1988
- Roller Compacted Concrete II 3-Day Training Course, American Society of Civil Engineers, February 29 to March 2, 1988
- Advanced Rock Mechanics 4-Month Training Course, University of Colorado at Denver, January to May 1987
- What's New in Dams – Design and Construction 1-Day Training Course, Colorado School of Mines/American Society of Engineers, March 13, 1986.
- Water Resources Management 4-Month Training Course, University of Colorado at Denver, August to December 1985
- Small Hydropower Development Seminar 5-Day Training Course, Electric Power Research Institute and U.S. Department of Energy, September 23 to 27, 1985
- International Workshop on Dam Failures 3-Day Training Course, Purdue University, August 6 to 8, 1985

- Symposia on Roller Compacted Concrete 2-Day Training Course, American Society of Civil Engineers, May 1 to 2, 1985
- Open Channel Hydraulics 4-Month Training Course, University of Colorado at Denver, January to May 1985
- Hydraulic Structure Design 4-Month Training Course, University of Colorado at Denver, August to December 1984
- Project Management Planning, Scheduling, and Control 3-Day Training Course, University of Denver, November 14 to 16, 1984
- Engineer as Manager 2-Day Training Course, Battelle Seminars and Studies Program, November 14 to 15, 1983
- Cold Regions Engineering 1-Week Training Course, University of Washington, June 17 to 20, 1983

#### **8. Countries of Work Experience:**

Malaysia, Vietnam, Philippines, Peru, Iceland, Jordan, Indonesia, Ecuador, Dominican Republic, Turkey, Nicaragua, Guyana, Lebanon, Puerto Rico and USA.

#### **9. Languages:**

English

#### **10. Employment Record**

From: September 2007 To: February 2008

Employer: Independent Consultant / Genterra Consultants  
Positions held: Structural Engineer

**Matilija Dam Safety Evaluation, California (2007 to date).** Structural engineer responsible for review and evaluation of instrument monitoring program for a 50-meter high concrete gravity arch dam originally constructed in 1949. The dam has experienced severe deterioration and cracking from alkali silica reaction resulting in expansion of the concrete. The structure has also experienced movement from deformation of the weak rock formations in the abutments and foundation. Responsibilities included reviewing previous investigations, structural analyses and monitoring data and developing recommendations for future monitoring to evaluate the condition of the concrete and safety of the dam.

From: June 2007 To: January 2008

Employer: Independent Consultant / Genterra Consultants  
Positions held: Failure Mode Analysis Facilitator

**San Gabriel Dam and Hydroelectric Project Potential Failure Mode Analysis, California (2007).** Facilitator responsible for conducting a Federal Energy Regulatory Commission (FERC) Potential Failure Mode Analysis (PFMA), which is a new feature of the dam safety program. A team of individuals familiar with the project identified, evaluated and categorized “potential” failure modes for the existing dam and other project works. The results of the PFMA process were used to enhance the Part 12D safety inspection, evaluate monitoring and surveillance programs, and formulate risk reduction

recommendations. The project consists of the 98-meter high earth and rockfill dam and two small hydroelectric power plants with a combined capacity of 4,975 kW.

From: January 2007 To: June 2007

Employer: Independent Consultant / Maunsell-AECOM

Positions held: Project Manager

**Nam Theun 1 Dam and Hydropower Project, Peoples Republic of Lao (January – June 2007).**

Project Manager stationed in Kuala Lumpur, Malaysia responsible for coordination and liaison between the EPC contractor and design engineer for preparation of preliminary and final designs for construction of a 177 meter high RCC gravity dam, 550 MW hydroelectric power plant and 145 kilometer long 500 KV transmission line.

From: November 2006 To: December 2006

Employer: Independent Consultant / MWH

Positions held: Structural Engineer

**Al Wehdah Dam, Jordan (2006).** Structural engineer responsible for reviewing diversion tunnel plug design and construction; providing advice on concrete temperature control during tunnel plug construction; reviewing structural stability analyses and evaluation criteria; reviewing and evaluating RCC verification coring and strength test results; developing a contraction joint surveying and monitoring program; preparing a contraction joint grouting procedure; providing advice on structural implications of early reservoir impoundment; assessing quality of conventional concrete construction; and reviewing contractor prepared reinforcement placement drawings for the outlet works structure. The project consists of a 100-meter high RCC dam with an uncontrolled overflow stepped spillway, stilling basin and multi-level irrigation and municipal water supply outlet.

From: May 2006 To: May 2008

Employer: Independent Consultant / Genterra Consultants

Positions held: Principal Structural Engineer

**Eagle Canyon Dam, California (2006 to date).** Principal structural engineer responsible for preparing structural designs, drawings and technical specifications for an outlet works intake structure, conduit and erosion protection basin and spillway stilling basin for a flood control dam. The dam will be a zoned embankment with a height of 18.3 meters. Appurtenant structures include an uncontrolled low level outlet and uncontrolled and unlined spillway.

From: April 2006 To: May 2008

Employer: Independent Consultant / CSA Puerto Rico

Positions held: Dam Specialist / Structural Engineer

**Rio Valenciano Dam, Puerto Rico (2006 to date).** Principal Reviewer and Dam Specialist responsible for performing a technical review of conceptual designs and solicitation documents for construction of a 30-meter high RCC dam and a 964 liter per second pumping plant. Developed recommendations for additional hydrologic analyses, seismicity investigations and preliminary dam design studies that should be completed before issuing the request for proposals for design and construction of the project. Performed technical review of dam and reservoir design criteria prepared by others for compliance with

applicable local and federal dam design guidelines and dam safety requirements. Also performed technical review and support for preparation of preliminary designs and drawings prepared by others. Currently responsible for providing support, technical guidance and engineering for preparation of final designs, drawings and technical specifications for the dam, spillway and outlet works.

From: October 2006 To: December 2006

Employer: Independent Consultant / City of Boulder, Colorado  
Positions held: Failure Mode Analysis Facilitator

**Barker Dam and Hydroelectric Project Potential Failure Mode Analysis, Colorado (2006).**

Facilitator responsible for conducting a Federal Energy Regulatory Commission (FERC) Potential Failure Mode Analysis (PFMA), which is a new feature of the dam safety program. A team of individuals familiar with the project identified, evaluated and categorized “potential” failure modes for the existing dam and other project works. The results of the PFMA process were used to enhance the Part 12D safety inspection, evaluate monitoring and surveillance programs, and formulate any risk reduction recommendations. The project consists of the 53-meter high concrete gravity dam; 7-kilometer long, 915-millimeter diameter concrete gravity pipeline; 5.5-meter high homogenous earth embankment dam; and a hydro plant that contains two 10 MW pelton turbines designed for 555-meters of static head.

From: September 2006 To: December 2006

Employer: Independent Consultant / Greybull Valley Irrigation District  
Positions held: Hydropower Specialist / Civil Engineer

**Greybull Valley Irrigation District Hydropower Feasibility Study Update, Wyoming, (2006).** Under direct contract with the District to update the flow and head data, power generation analysis, construction cost estimates and economic analysis for addition of hydroelectric facilities at three existing irrigation water supply dams. Turbine sizes ranged from 2.6 MW to 5.0 MW.

From: March 2006 To: May 2006

Employer: Independent Consultant / MWH  
Positions held: Structural Engineer

**Karahnjukar Hydroelectric Project, Iceland (2006).** Design Manager responsible for development of mitigation measures to address an increase in the seismic design criteria for a 193-meter high concrete-faced rockfill dam. Mitigation measures included revisions to the face slab vertical joint design in the maximum section of the dam, additional grouting of several faults through the foundation, and modification of the grouting gallery lining to accommodate potential movement across the faults. Also responsible for performing a design audit of all calculations and reports to ensure compliance with QA/QC procedures. In addition, responsible for conducting a review of previous static and dynamic structural analysis of the dam to determine if additional studies are required to evaluate the increase in peak ground acceleration.

From: June 2006 To: November 2006

Employer: Independent Consultant / Dahlgren Consulting  
Positions held: Hydropower Specialist / Civil Engineer

**Jons Drop Hydropower Feasibility Study, Wyoming (2006).** Lead Hydropower Engineer responsible for conducting a feasibility study of a potential small hydropower facility to replace a drop on an existing canal system. The existing drop is designed to convey a maximum of 2 cms with a gross head of about 21.3 meters. Alternatives evaluated varied from 125 kW to 340 kW depending on the design flow.

From: May 2006 To: November 2006

Employer: Independent Consultant / Crofton Diving

Positions held: Civil / Structural Engineer

**Buford Dam Sluice Gate Replacement Project, Georgia. (2006)** Quality Assurance and Quality Control Officer for the design-build contractor and gate manufacturer for replacement of two existing service sluice gates with new gates containing integral jet flow gates. Each jet flow gate will discharge 17,000,000 cubic meters per second under a reservoir head of 48.8 meters. The project is owned and operated by the Corps of Engineers.

From: October 2005 To: January 2006

Employer: Independent Consultant / MWH

Positions held: Project Manager / Hydropower Engineer

**Lake Dorothy Hydroelectric Project, Alaska. (2005)** Project Manager responsible for directing the preparation of final designs, drawings and specifications for a 45 MW high head hydroelectric facility located near Juneau. The project is owned by Alaska Electric Light and Power and includes a three unit powerhouse located at tide water, 3.2-kilometer long access road through rugged terrain, 2.7-kilometer long 1524-millimeter diameter welded steel penstock, rockfill dam, tunnel and lake tap. The project is wholly on U.S. Forest Service land and licensed by the Federal Energy Regulatory Commission.

From: February 2005 To: July 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Manager / Structural Engineer

**Anyox Dam Evaluation, British Columbia, Canada (2005)** Project Manager responsible for coordination and technical oversight for a structural stability and stress analysis of an 80-year old multiple arch buttress concrete dam. The dam was originally constructed to provide water for hydropower generation for the nearby copper mine. The mine and town were vacated in 1935. The dam was abandoned in 1968. The dam is approximately 45.7-meters high and 213-meters long and includes twenty-six arches, each spanning 7.3-meters. The analysis involved evaluation of the structural integrity and stability of the structure for flood and earthquake loading using simple methods according to the Federal Energy Regulatory Commission Guidelines for the evaluation of hydropower projects. The analysis considered the current state of deterioration of the structure and identified rehabilitation measures needed to restore its integrity.

From: January 2005 To: May 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Manager / Hydropower Engineer

**Magalia Reservoir Raw Water Bypass, California (2005)** Project Manager responsible for coordination and technical oversight of a feasibility study to add hydropower to Paradise Dam combined

with a pipeline bypass around Magalia Reservoir to address water quality issues during reconstruction of Magalia Dam. Also coordinated and directed preparation of a FERC preliminary permit application for the Paradise Irrigation District to secure their right to study the hydropower project for potential development.

From: August 2004 To: January 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Director / Hydropower Engineer

**St. Mary Diversion and Conveyance Facilities Rehabilitation, Montana (2004 to 2005)** Project Director responsible for coordination and technical review of a condition assessment and identification of remedial measures for rehabilitation of a 100-year old, 16.8-kilometer long water diversion system. Specifically responsible for evaluation of 8 miles of unlined canal and five reinforced concrete drop structures originally designed to convey 22.7-cms.

From: August 2004 To: January 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Crowheart Area/Dinwoody Canal Level I Study, Wyoming (2004-2005)** Project Director responsible for administration and technical review of studies to identify potential solutions to chronic water shortages at the end of the irrigation system in the Crowheart and Willow Creek areas. Directed preparation of conceptual designs and cost estimates for alternatives to enlarge lower Dinwoody Lake and construction of a new re-regulation reservoir on Willow Creek.

From: September 2004 To: May 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Sly Creek Dam, Lost Creek Dam and Ponderosa Dam Spillway Modification Project, California. (2004)** Project Director responsible for administration and technical review of studies to identify and evaluate alternatives to enhance the spillway at each dam to safely pass the probable maximum flood (or inflow design flood), whichever is determined to be most appropriate. Lost Creek Dam is a 37.2-meter high concrete overflow arch constructed in 1963. Sly Creek Dam is an 82.6-meter high zoned embankment constructed in 1961 with a spillway controlled by a single radial gate.

From: January 2003 To: May 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Director / Structural Engineer

**Eagle Nest Dam Rehabilitation, Interstate Stream Commission, New Mexico. (2003 to 2005)** Project Director and Principal Structural Engineer responsible for administration, coordination and technical oversight for the safety evaluation of a 42.7-meter-high concrete gravity arch dam constructed in 1916. Phase I studies determined that the spillway is inadequate to pass the probable maximum flood (PMF), the outlet gates are in need of repair, the foundation and abutments of the dam would be eroded during an overtopping event and the dam and outlet works would be inaccessible during spillway discharges. Phase II involves: preparing designs, drawings, specifications, bid documents and construction cost estimates

alternatives to rehabilitate the six inlet and outlet gates; more extensive erodibility analysis and development of designs to stabilize the foundation and abutments against erosion during overtopping; further investigations of the structural integrity of the dam; and preparation of an emergency action plan and operation and maintenance manual..

From: April 2004 To: June 2004

Employer: Engineering Consultants International / AECOM

Positions held: Structural Engineer

**Wadi Ma'In, Zara and Mujib, Water Treatment and Conveyance Project, Amman, Jordan. (2004)**

Principal Structural Engineer responsible for technical review of designs and drawings prepared by a local consultant partner for a design/build treated water conveyance system. The structures were designed considering the seismicity of the area and high sulfate and chloride content of the local soils. The primary components of the system includes a 40 km long welded steel 600 mm diameter transmission pipeline designed for a maximum flow of 1.5 cubic meters per second, five major pumping plants designed for a static head of 1,280 meters and dynamic head of about 280 meters, reinforced concrete receiving reservoirs at each pump stations (5000 cubic meters at four stations and 8000 cubic meter at the first station), and an intermediate 10,000 cubic meter reinforced concrete reservoir.

From: November 2003 To: May 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Director / Hydropower Engineer

**Boulder Canyon Hydroelectric Feasibility Studies, City of Boulder, Colorado. (2003 to2005)**

Project Director responsible for administration and technical review of feasibility studies to identify and evaluate alternatives for addition of hydropower to the existing Barker Dam and Middle Boulder Creek water supply system. The system includes dams, pipelines, pressure reducing stations and an existing hydroelectric plant. Initial studies included estimates of potential generation capability, estimated construction costs, and revenues. Also included was an assessment of FERC permitting requirements for each potential alternatives.

From: June 2003 To: January 2004

Employer: Engineering Consultants International / AECOM

Positions held: Project Director / Hydropower Engineer

**Conroe Dam Hydroelectric Feasibility Study, San Jacinto River Authority, Conroe, Texas. (2004)**

Project Director responsible for administration and technical review of a feasibility study to identify and evaluate alternatives for addition of hydropower to the existing dam. The study included development of flow duration curves, energy studies, turbine optimization, conceptual facility design, cost estimates, electrical revenue estimates, and economic analyses.

From: June 2003 To: April 2004

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Bridger Valley Reservoir Enlargement and Water Supply Study, Wyoming. (2003 to 2004)**

Project Director responsible for administration and technical review of a feasibility study to identify and evaluate

reservoir alternatives to store releases from Stateline Dam during drought years and late summer months. Specifically, the study evaluated the proposed Jack Hollow Reservoir as a viable storage facility. Two alternative water supply sources and seven alternative storage sites to Jack Hollow Reservoir were evaluated.

From: June 2002 To: June 2003

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Greybull Valley Irrigation District Hydropower Feasibility Study, Wyoming. (2002 to 2004)**

Project Director responsible for administration and technical review for an irrigation based hydropower generation feasibility study. The system includes three dams and two canal drops with potential for hydropower. The study examined the possibility of enclosing the canal drops into pipe drop structures as potential hydropower sources along with the addition of hydropower at the dam outlet structures. The study included an analysis of power markets and power grids in the project area.

From: June 2002 To: June 2003

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Viva Naughton Reservoir Enlargement Study, Wyoming. (2002 to 2004)** Project Director responsible for administration and technical review for a study of 26 alternatives to enlarge the existing reservoir. The focus of the study was on developing conceptual designs and costs of alternatives to bring more water into the basin or store more water from the spring runoff in new, raised, or underground reservoirs. Tasks included developing hydrology; performing reservoir yield analysis; preliminary designs of tunnels, pipelines, and dams; cost estimates; environmental assessment, and preliminary permitting.

From: June 2002 To: June 2003

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**City of Cheyenne Hydropower Feasibility Study, Wyoming. (2002 to 2004)** Project Director responsible for administration and technical review for a municipal water supply system hydropower generation feasibility study. The City of Cheyenne municipal water system has several areas with significant head pressure reduction. The project included an inventory and evaluation of the entire raw and treated water system to identify all sites with hydropower potential. Economic and financial analyses were completed to identify the most promising sites for further study.

From: May 2002 To: March 2004

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Halligan Reservoir Enlargement, Colorado. (2002 to 2004)** Project Director responsible for administration of engineering, permitting and environmental evaluation of alternatives to expand Halligan Reservoir from 8-million to 1.9-, 3.1- 5.0-million cubic meters for the City of Fort Collins. Three dam sites were considered for roller-compacted concrete, concrete arch, concrete faced rockfill or earth-rockfill dams at heights ranging from 30.5-meters to 54.9-meters. The work included feasibility level

designs and cost estimates for 27 options. Preliminary designs are currently being prepared for the selected option.

From: June 2002 To: May 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Palmetto Bend Dam, Lavaca-Navidad River Authority, Edna, Texas. (2002 to 2005)** Project Director responsible for administration of a general engineering services contract to provide dam safety expertise to the owner for repair and modernization of the dam and appurtenant structures.. The earthfill dam is 28.4-meters high and 13.3-kilometers long (including 11-kilometers of dikes) and was completed in 1981. Specific assignments have included an evaluation of the impacts on the dam, spillway and outlet works structures of raising the permanent pool of the reservoir, evaluation of dam monitoring instrumentation and recommendations for additional instrumentation, and preparing designs for modernization of the spillway gate control system including addition of data collection and telecommunication equipment.

From: September 2001 To: August 2002

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Patillas Dam Gate Maintenance Project, Puerto Rico. (2001 to 2004)** Project Director responsible for administration, quality assurance and technical review for detailed climbing inspection, condition assessment and preparation of construction documents and cost estimates for rehabilitation of three automatic float-operated spillway tainter gates. Each gate is 9.2-meters wide and 10.7-meters high and built in 1972.

From: November 2001 To: June 2002

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Hoopess Dam, City of Wilmington, Delaware.** Project Director responsible for administration, quality assurance and technical review for inspection and safety evaluation of a 39.2-meter high concrete gravity dam located immediately upstream of the city.

From: September 2000 To: October 2000

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Rio Blanco Diversion Dam, Puerto Rico.** Project Director responsible for administration, quality assurance and technical review for inspection, condition assessment and preparation of construction documents and cost estimates for rehabilitation of two 1.8-meter high, 15.2-meter long hydraulic cylinder operated bascule gates.

From: September 2000 To: May 2005

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Lower Colorado River Authority Hydroelectric Intake Structure and Gate Refurbishment Project, Texas.** Project Manager responsible for coordinating and managing detailed inspection, condition assessment, recommendations for refurbishment, cost estimates, schedules and priorities for modernization and rehabilitation of hydroelectric intake and draft tube structures, gates and hoisting equipment and gantry crane at five dams on the Colorado River near Austin, Texas. Gate types include fixed wheel, roller mounted and top seal tainter gates. Hoisting equipment included roller link chain and wire rope hoists with balancing beams and multi-part sheaves. The projects are Austin (17.3 MW), Buchanan (51.3 MW), Mansfield (102 MW), Starcke (37 MW) and Wirtz (56 MW).

From: May 1999 To: May 2000

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Cheyenne South Crow Diversion Dam Rehabilitation Project, Wyoming.** Project Officer responsible for quality assurance and technical review of feasibility studies for a replacement dam on South Crow Creek and conceptual designs for rehabilitation of a 9.1-meter high existing diversion structure, outlet works and 406-millimeter diameter pipeline.

From: July 1999 To: July 2002

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Garzas Dam, Puerto Rico** Project Officer responsible for coordination of a safety evaluation of a 67-meter high embankment dam built in 1943. Work includes a safety inspection, geotechnical field investigations, seepage analyses, stability analyses for static and earthquake loadings, and development of remedial measures to bring the dam into conformance with current Federal dam safety guidelines.

From: July 1999 To: July 2002

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Lucchetti Dam, Puerto Rico** Project Officer responsible for coordination of a safety evaluation of a 54.2-meter high concrete gravity dam built in 1952. Work includes a safety inspection, geotechnical field investigations, foundation drain cleaning to reduce uplift pressures on the dam, seepage analyses based on results of field investigations and drain cleaning, static and dynamic (earthquake) stability analyses, and development of remedial measures to bring the dam into conformance with current Federal dam safety guidelines.

From: May 1999 To: September 2004

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Gillespie Dam Structural Evaluation, Arizona.** Project Manager responsible for managing and directing seepage and stability analysis of the foundation and 3D finite element structural analyses of a 6-meter-high, 548-meter-long, concrete multiple arch buttress dam. The studies are being completed to develop an understanding of why the dam failed during a major flood in 1993. The dam was originally

built in 1908 across the Gila River to provide water for irrigation. The buttress dam was built on reinforced concrete piles with upstream and downstream concrete cutoff walls.

From: May 1999 To: July 2000

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Northeast Texas Regional Water Supply Study.** Project Manager responsible for directing the preparation of reservoir planning studies under the guidance of Senate Bill No.1 to access potential for additional surface water supply reservoir storage for the City of Fort Worth. The data and estimated costs for a total of 15 potential storage sites were evaluated and tabulated for further study.

From: December 1999 To: September 2004

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Carraizo Dam Floodgate Replacement, Puerto Rico** Project Manager responsible for managing, coordinating and directing a team of specialists in preparing designs, drawings, specifications, cost estimates and providing construction support for fabrication of a segmental floating bulkhead; replacement of eight 11.9-meter wide, 10-meter high, spillway tainter gates and hoists; replacement of an existing 1.8-meter wide, 3-meter high trash sluice gate with a pneumatic leaf gate; development of trash and water hyacinth control and removal methods, and rehabilitation of intake pipes to the pump station. This is an emergency project for the Puerto Infrastructure Financing Authority due to severe deterioration of the existing riveted gates and approaching hurricane season. The reservoir provides about 45% of the water supply to San Juan, Puerto Rico.

From: October 1999 To: November 1999

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Livingston Dam Tainter Gate Evaluation, Texas** Project Manager responsible for directing inspection, structural analysis and condition assessment of twelve existing 12.8-meter wide, 15.2-meter high spillway tainter gates at a 27.4-meter high embankment dam. Structural analysis included evaluation of the gates for stresses due to normal loading conditions plus trunnion friction.

From: September 1998 To: November 1998

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Dam Design Training Seminar, Indonesia.** Conducted a dam design seminar for a group of 35 Indonesian engineers at the Bekasi Training Center near Jakarta. Topics included rockfill dam design and analysis, static and dynamic stability analysis, instrumentation, reservoir size optimization, river diversion, and spillway design.

From: June 1998 To: August 1999

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Wiwili Dam and Hydroelectric Project, Nicaragua** Principal Structural Engineer responsible for technical review and providing design assistance to ECICO, a local consulting firm, for a United Nations Development Program funded small, rural hydroelectric project in a very remote location in northern Nicaragua. The project includes 15-kilometers of access road, a 10-meter high concrete gravity diversion dam with side channel spillway, multi-level intake, sediment sluice and rock trap, a 1.1-kilometer long, 1.0-meter diameter low pressure pipeline/penstock, and a 1.4 MW, twin turbine, power house with net head of 130 meters.

From: July 1997 To: December 2000

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Torata Dam Flood Control Project, Peru** Quality Assurance Officer and Technical Reviewer responsible for final technical review of designs, drawings, specifications and costs estimates for construction of a 116-meter-high concrete faced rockfill dam with a gated, multilevel intake structure, outlet works, and 11.2-kilometer-long, 3.0-meter-diameter water conveyance tunnel located at a copper mine in southern Peru.

From: June 1996 To: August 1997

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Alcoa Tainter Gate Studies, Tennessee and North Carolina.** Project Manager responsible for managing, coordinating and directing engineering studies involving an inspection and condition assessment and structural analysis to establish safety factors to evaluate the existing condition of 70 Tainter gates of various sizes and shapes at six different FERC licensed hydroelectric dams on the Tapoco and Yadkin Projects. Also managed the inspection, evaluation and testing of existing handrails at the dam and hydropower facilities and existing guardrails throughout the projects for compliance with applicable codes.

From: January 1995 To: December 2002

Employer: Engineering Consultants International / AECOM

Positions held: Project Director

**Logan First Dam Project, Utah.** Project Manager responsible for directing a review of designs developed by the previous consultants, identification of acceptable modifications and evaluation of additional or substitute alternatives to modify and upgrade the existing 9.1-meter-high Ambursen buttress concrete dam and spillway to safely pass the PMF, withstand shaking from earthquake loading and survive displacement from a fault on the left abutment. The preferred rehabilitation alternative includes an RCC buttress to prevent sudden failure of the dam, RCC overtopping protection to prevent erosion, relocation of the powerhouse and installation of a 300 kW Kaplan turbine to replacement to old Francis turbine, and addition of pneumatic leaf gates to improve operation and enhance capacity of the spillway.

From: July 1995 To: December 2000

Employer: Engineering Consultants International / AECOM

Positions held: Team Leader / Structural Engineer

**Irrigation and Flood Protection Rehabilitation Project, Hanoi, Vietnam.** Team Leader responsible for managing, coordinating and directing a group of 12 engineers and scientists in preparing studies and designs for 3 projects under the first ADB loan to the Ministry of Agriculture and Rural Development. The Hanoi Dike subproject involved analysis and preparing designs and bidding documents for construction of bank protection, embankment stabilization and foundation treatment of 45 km of the dike along the Red River through Hanoi. The two irrigation system rehabilitation projects included an agricultural and socio-economic study. The Song Chu Irrigation System subproject, located near the city of Thanh Hoa, involved preparing studies, designs and construction documents for rehabilitation of a 17 m high, 300 m long masonry diversion weir, sluice and canal headworks structures on the Chu River and resectioning and partial lining of 110 km of main and secondary canals and rehabilitation of 22 major structures, 30 secondary canal water intakes and 1,180 farm intakes to serve 50,000 hectares. The North Nghe An Irrigation System subproject, located near the city of Vinh, involved preparing studies and designs for rehabilitation of a 275 m long diversion weir across the Ca River, resectioning and partial lining of 40 km of main canal, construction of a new 2.5 m diameter tunnel and rehabilitation of hydraulic control structures, pumping stations, siphons, spillways and 66 water intakes on secondary and tertiary canals to serve 30,000 hectares.

From: July 1995 To: December 2000

Employer: Engineering Consultants International / AECOM  
Positions held: Team Leader / Structural Engineer

**Song Chu Irrigation System and Bai Thuong Weir Rehabilitation Project, Vietnam.** Lead Structural engineer and concrete specialist responsible for preparing designs, drawings, specifications and cost estimates for rehabilitation of a 17 m high, 300 m long weir, sluice, canal headworks and navigation lock structures originally constructed in 1922 of rubble concrete with masonry stone facing. Rehabilitation designs include a roller compacted concrete (RCC) stepped spillway (the first RCC in Vietnam), reinforced concrete diaphragm wall, reinforced concrete overlays, concrete stilling basin energy dissipator, rock filling and riprap, foundation treatment and mechanical and electrical equipment for 10 new gates. Designed temporary works include river diversion, cofferdams, steel sheet piling, and access roads to enhance difficult site access.

From: July 1995 To: December 1995

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Seaman Dam Spillway Rehabilitation, Colorado.** Quality Control Officer responsible for technical review of designs, drawings and technical specifications for replacement of an existing spillway for an embankment dam in an alpine environment in Colorado. The new spillway includes a 6.1-meter high, 91.4-meter long labyrinth overflow section and a stepped spillway chute.

From: July 1990 To: May 2005

Employer: Engineering Consultants International / AECOM  
Positions held: Project Director

**Lakewood Pipeline and Hydropower Project, Boulder, Colorado.** Project manager responsible for supervising and directing a team in the preparation of conceptual, preliminary and final designs for replacement of 17.7-kilometers of 762- and 914-millimeter diameter high pressure welded steel water

supply pipeline across private and federal lands and construction of a 3.5 MW, 549-meter-head, hydropower facility for the City of Boulder. Initial responsibilities involved providing engineering support and alternative evaluation for preparation of an EIS by the U.S. Forest Service. Subsequent phases have involved preliminary designs of several alternatives and preparation of final designs, drawings, specifications, cost estimates, contract documents and construction management.

From: July 1995 To: August 2000

Employer: Engineering Consultants International / AECOM  
Positions held: Project Manager

**Silver Lake Pipeline and Hydroelectric Project, Colorado** Project manager responsible for directing and supervising a team in preparation of permits and conceptual, preliminary and final designs drawings and specifications for replacement of 5.6 km of existing gravity flow pipeline with a new 762 mm diameter high pressure steel water supply pipeline, in an alpine environment, and construction of a 3.2 MW high head (366 m) hydropower facility for the City of Boulder.

From: July 1994 To: December 1998

Employer: Engineering Consultants International / AECOM  
Positions held: Principal Structural Engineer

**Bisri Dam and Hydroelectric Project, Lebanon.** Principal structural engineer and technical reviewer responsible for directing preparation of feasibility and final designs, drawings, specifications and cost estimate for construction of 74-meter-high composite RCC/earth embankment dam, spillway, outlet works and hydroelectric powerplant on the Bisri River, 32-kilometers east of Beirut. The dam design includes a unique RCC spillway in the center of the earthfill embankments.

From: January 1992 To: December 1994

Employer: Engineering Consultants International  
Positions held: Technical Reviewer

**Mogollon Dam, Arizona.** Principal technical reviewer responsible for QC review of feasibility studies and final designs, drawings, specifications and cost estimate for construction of a new 28-meter high concrete faced rockfill dam, spillway and outlet works near Heber, Arizona. The final design included lining the reservoir with a geomembrane to prevent excessive seepage and formation of sinkholes in the foundation. The dam sizes studied ranged in height from 18.3- to 30.5-meters, with crest lengths ranging from 243.8- to 609.6-meters. Three alternative dam axis locations and three types of dams were evaluated. Earthfill, rockfill, and roller-compacted concrete (RCC) dam alternatives were analyzed for comparison of reservoir surface areas, water level fluctuation, dam volumes, estimated foundation conditions, and spillway and outlet requirements.

From: June 1994 To: July 1994

Employer: Engineering Consultants International  
Positions held: Project Principal

**Orchard Mesa Irrigation District, Colorado.** Project Principal responsible for managing a general services contract to the district. Current projects include investigation, evaluation and development of methods, procedures and specifications to repair leakage at construction joints in a 2.5-meter high by 5.2-

meter wide concrete flume and to repair or replace deteriorated concrete in the 3.7-meter diameter, 50.3-meter long Stokes Gulch Siphon. The construction joints are leaking due to improper placement of waterstops. The flume and siphon convey 800 cfs of irrigation water. The siphon is 70 years old and constructed of concrete without air entrainment which is not resistant to freeze-thaw damage.

From: February 1994 To: November 1995

Employer: Engineering Consultants International  
Positions held: Principal Civil/Structural Engineer

**North Canadian River Eastern Avenue Dam Project, Oklahoma.** Principal civil/structural engineer responsible for preparing designs and drawings for construction of three 4-meter high, 30-meter long, hydraulically operated pelican (basculer or hinged crest) gate structures across the river to form a lake for urban development in Oklahoma City. Designs included riprap erosion protection upstream and downstream of the gate structure and a sheet piling cutoff wall beneath the structure to minimize seepage and reduce the hydrostatic pressures. Preliminary design design included evaluation of alternative gate types including inflatable rubber dams.

From: January 1994 To: December 1996

Employer: Engineering Consultants International  
Positions held: Project Manager

**North Boulder Creek and Como Creek Diversion Structures, Colorado.** Project Manager and principal civil/structural engineer responsible for preparing conceptual and final designs, drawings, specifications and cost estimates for replacement of three existing concrete diversion structures for the City of Boulder. The Silver Lake Pipeline diversion structure consists of a parshall flume and a concrete weir structure with a manually operated gated outlet to the pipeline and a gated bypass pipe. The Lakewood Reservoir diversion structure consists of a double parshall flume, concrete weir structure with stoplogs, gated outlet to the pipeline, CMP arch, stilling basin, a second parshall flume and an elevated CMP arch across Como Creek. The Como Creek diversion structure consists of a gated concrete weir. The replacement designs include all of the components of the existing structures plus constant head orifice structures to control and measure bypass flows and construction of stilling wells and installation of instrumentation and telemetry equipment to measure and record flows to all facilities.

From: August 1994 To: August 1995

Employer: Engineering Consultants International  
Positions held: Project Manager / Lead Structural Engineer

**PacifiCorp Hydroelectric Rehabilitation Projects, Utah and Idaho.** Team Leader, lead structural engineer and technical reviewer responsible for managing and directing technical studies and preparing preliminary designs and cost estimates for rehabilitation of 10 projects at 6 small, low to medium head hydroelectric installations. The hydroelectric projects included the **Pioneer, Grace, Cove, Last Chance, Ashton and St. Anthony Hydroelectric** facilities. As team leader, directed and supervised 4 different teams and, as lead structural engineer, participated in preparing conceptual and preliminary designs for addition of a low level outlet works at a timber crib dam; evaluation and design for replacement of a 3.4-meter diameter, 4-kilometer-long wood stave flowline; evaluation and design for replacement of a 31.2 cms, 1524-meter long wood flume; addition of a shut off valve and automatic leak detection system on a 98-year-old, 1830-millimeter diameter riveted steel penstock; redesign for replacement of a precast double tee removable roof; design of a new flume and headgate to replace an existing wood flume and

stoplogs; design of new bulkheads and guides for an existing diversion wasteway; design for repair of an existing aluminum powerhouse roof; design for replacement of an existing maintenance building; and design of an equipment storage building.

From: March 1994 To: December 1996

Employer: Engineering Consultants International

Positions held: Quality Control Officer

**Sinnard Dam Rehabilitation Project, Wyoming.** Quality Control Officer responsible for technical review of preliminary and final designs, specifications and construction drawings for rehabilitating an existing 9-meter-high earthfill dam with seepage and stability problems. Designs included chimney and horizontal blanket drains at the downstream toe of the embankment, flattening the downstream slope and replacing the outlet works.

From: July 1993 To: August 1994

Employer: Engineering Consultants International

Positions held: Project Manager

**Twin Lakes and Lake Mary Dams, Utah.** Project Manager responsible for directing and conducting dam safety inspection and evaluation and structural stability analyses of two concrete dams for Salt Lake City located in the Wasatch Mountains at the head waters of Big Cottonwood Creek and near the Wasatch Fault. Twin Lakes Dam is a 21-meter high rubble concrete gravity structure with a crest length of 207-meters. Lake Mary Dam is a 23.2-meter high rubble concrete gravity dam with a crest length of 100.6-meters. The dams were constructed in 1914 and have experienced extensive deterioration. The studies included development of remedial measures to modify and upgrade each dam to safely pass the PMF and resist forces from nearby earthquakes. Alternatives evaluated to stabilize the dams included a RCC buttress against the downstream face and concrete overlays on both faces to prevent further deterioration.

From: September 1993 To: October 1993

Employer: Engineering Consultants International

Positions held: Project Manager

**Lakewood Reservoir Spillway Replacement, Colorado.** Project Manager responsible for preparing emergency designs for replacement of a failed spillway at an off channel reservoir which supplies water to the City of Boulder. Directed preparation of designs and specifications and performed construction management for emergency construction of a concrete replacement structure with added features to bypass and measure instream flows and reservoir levels.

From: October 1993 To: December 1995

Employer: Engineering Consultants International

Positions held: Project Engineer / Principal Structural Engineer

**Mountain Dell Dam Rehabilitation Project, Utah.** Project Engineer and Principal Structural Engineer responsible for supervising, directing and participating in a dam safety inspection and preparing compliance studies and remediation plans for a 44.4 m high multiple arch buttress dam for the Salt Lake City Public Utilities Department. Phase 1 of the project included: hydrologic studies to determine the PMF; geologic and seismic studies to determine the MCE; full three-dimensional finite element stress and

stability structural analysis for normal, flood and earthquake loadings; development of remedial designs to correct deficiencies and preparation of preliminary designs. Phase 2 included more sophisticated 3D finite element modeling to simulate cracking of the arches during earthquake loading and evaluation of resulting stresses using yield-displacement theory and preparation of final designs, drawings and specifications and construction management for addition of an auxiliary spillway to safely pass the maximum flood.

From: May 1992 To: December 1998

Employer: Engineering Consultants International  
Positions held: Quality Control Officer

**Lyman Dam Irrigation System Rehabilitation Project, Arizona.** Quality Control Officer responsible for technical review of designs to rehabilitate two earth dams (70-ft and 30-ft-high) and replace the spillway structure for an irrigation water supply project. Project involved a seismicity study, slope stability and seismic deformation analyses and preparing drawings and specifications to raise the dam and construct a new spillway to pass the PMF.

From: June 1992 To: May 2005

Employer: Engineering Consultants International  
Positions held: Principal Engineer

**River Reservoir No. 3 Dam Irrigation System Rehabilitation Project, Arizona.** Principal engineer responsible for conducting a dam safety evaluation and developing designs to rehabilitate a 75 year old, 16.2-meter high, 322-meter long, earth and rockfill high hazard dam. Dam safety concerns included inadequate spillway capacity, potential for uncontrolled seepage, a sink hole on the upstream face, potential slope failure due to an overly steep downstream face, and deteriorated outlet works gates and trashrack.

From: May 1992 To: June 1992

Employer: Engineering Consultants International  
Positions held: Project Manager

**LaPlata Dam, Puerto Rico.** Project manager and lead structural engineer responsible for conducting a dam safety inspection and performing stress and stability structural analyses and evaluating increased seepage in the galleries and the condition of the foundation drains following an extreme flooding event which resulted in spillway discharges of approximately one half the PMF for a 40 m high, 233 m long concrete gravity dam with 5 bascule crest gates.

From: April 1991 To: December 1998

Employer: Engineering Consultants International  
Positions held: Project Manager / Principal Structural Engineer / Hydropower Engineer

**Taylor Draw Dam and Hydroelectric Project, Colorado.** (FERC No. 8914) Project Manager and principal structural engineer responsible for directing and supervising a general consulting services contract with the Rio Blanco Water Conservancy District to review and monitor design and construction of stilling basin rehabilitation, spillway enlargement, dam raise and addition of a 3MW hydro plant. Technical assistance has included analysis of the sliding stability of the reinforced earth spillway on the

rock foundation, evaluation and repair of buckled conduit liner, development and monitoring of construction to repair spalling and deteriorated concrete in the spillway, evaluation of a leaking draft tube gate, and preparation of a comprehensive O&M manual for the dam, spillway and outlet works.

From: January 1992 To: December 1993

Employer: Engineering Consultants International  
Positions held: Principal Structural Engineer

**Santa Ana Rubber Dams Groundwater Recharge Project, California.** Principal structural engineer responsible for preparing conceptual, preliminary and final designs, drawings and technical specifications for construction of two rubber dam structures on the Santa Ana River upstream of existing Corps of Engineers drop structures for the Orange County Water District to facilitate the ground water recharge program.

From: February 1989 To: November 1989

Employer: Engineering Consultants International  
Positions held: Project Manager

**Marshall Ford Dam, Texas and Mountain Park Dam, Oklahoma.** Project manager responsible for performing SEED (Safety Evaluation of Existing Dams) analysis for the U.S. Bureau of Reclamation for two concrete dams and their appurtenant earth embankments. Mountain Park Dam is a 163.1 m long, 40.5 m high double-curvature thin arch flanked by concrete thrust blocks with two earth saddle dikes. Marshall Ford Dam is a 738.7 m long, 84.8 m high concrete gravity structure flanked by earth embankments and two earth saddle dikes. Engineering responsibilities included hydraulic and hydrologic evaluation of each dam's ability to pass the PMF, development of earthquake ground motion data, stability analyses of the embankment sections and two- and three-dimensional finite element structural analysis of the concrete sections of each dam for normal, flood and seismic loadings.

From: January 1990 To: December 1990

Employer: Engineering Consultants International  
Positions held: Project Manager

**Safety Evaluation of Existing Bureau of Reclamation Dams.** Project manager responsible for supervising and directing a team and participating in studies to assess hydrologic, hydraulic, and structural dam safety adequacy of dams on the lower Colorado River including: **Glen Canyon Dam** (216.5 m high concrete arch); **Hoover Dam** (221.3 m high concrete gravity arch); **Davis Dam** (61 m high zoned embankment); **Parker Dam** (97.6 m high concrete arch); **Imperial Dam** (concrete slab-buttress structure with a total length of 1062 meters). Responsibilities included evaluation of each dam's ability to accommodate each PMF; reservoir evacuation analysis; structural stability and stress analysis for static, flood and seismic loading conditions; geological and geotechnical evaluation of embankments and foundations including static and dynamic stability, seismotectonics, liquefaction, seepage, deformation, landslides, landslide induced waves; and overtopping erosion; development of modification decision analysis field programs and memorandums; and failure mode analysis due to static, seismic, or hydrologic loadings.

From: May 1991 To: August 1991

Employer: Engineering Consultants International

Positions held: Project Manager / Principal Structural Engineer

**New Elmer Thomas Dam, Oklahoma.** Project manager and principal structural engineer responsible for directing, reviewing and conducting two-dimensional finite element thermal studies and three-dimensional finite element earthquake stress and stability analysis for the U.S. Fish and Wildlife for a new 35-m-high roller compacted concrete (RCC) gravity dam constructed in a narrow canyon near an active fault with potential for a magnitude 7.5 earthquake at an epicentral distance of 7.0 kilometers.

From: May 1990 To: November 1990

Employer: Engineering Consultants International

Positions held: Project Manager

**Comanche Dam Rehabilitation, Colorado.** Project manager responsible for construction management and contract administration for rehabilitation of a 12.2-meter high, 457-meter long embankment dam owned by the City of Greeley and located at elevation 2865 meters on the north edge of Rocky Mountain National Park. Rehabilitation consisted of replacing both outlet works, constructing a new 45.7-meter wide roller compacted concrete (RCC) lined spillway, and raising the embankment. Engineering services included assistance with bidding, full time on-site inspection, supervising construction, quality control, review of contractor submittals, and preparation of design changes during construction.

From: June 1990 To: December 1992

Employer: Engineering Consultants International

Positions held: Project Manager

**Carraizo Dam, Puerto Rico.** Project manager responsible for directing and conducting a safety inspection and stability evaluation and development of rehabilitation, stabilization and spillway enhancement measures for a 30.5-meter high concrete gravity dam and gated spillway overtopped during Hurricane Hugo for the Puerto Rico Aqueduct and Sewer Authority.

From: August 1990 To: September 1990

Employer: Engineering Consultants International

Positions held: Project Director

**Little Hell's Canyon Dam, Arizona.** Project manager responsible for directing engineering studies to evaluate conformance with current state safety standards of an existing 224.4-meter high, 244-meter long, embankment dam, spillway and outlet works. The work involved geotechnical and geological field investigations, hydrologic studies, hydraulic evaluation, stability analysis of dam and foundation, environmental assessment, and formulation of rehabilitation alternatives.

From: June 1991 To: July 1991

Employer: Engineering Consultants International

Positions held: Quality Control Officer

**San Francisco Hydroelectric Project, Ecuador.** Quality Control Officer responsible for technical review, in country, of designs and contract documents prepared for a 250 MW (2 unit) underground hydroelectric project including 16 km of tunnels, three concrete diversion dams, desanders, and vertical drop shafts. The underground hydroelectric power plant contains two Francis turbines designed for a head of 201 m and flow of 12.8 cms.

From: January 1986 To: December 1989

Employer: Engineering Consultants International

Positions held: Quality Control Officer

**Golder Ranch Dam Project, Arizona.** Quality control engineer responsible for reviewing and checking designs, drawings, and specifications prepared for reconstruction of the breached 42.7-meter high embankment dam, PVC lining of the reservoir to minimize seepage, enlargement of the spillway, and modification of the outlet works. Preliminary designs were prepared and approved by the state engineer prior to submittal of the contract documents in March 1989 for final review and approval.

From: January 1987 To: December 1989

Employer: Engineering Consultants International

Positions held: Project Manager

**CAP/SRP Interconnection Facility Project, Arizona.** Project manager responsible for directing and conducting preparation of conceptual, preliminary and final designs, drawings, technical specifications and cost estimates and providing construction support for a 34 cms municipal, industrial and agricultural water conveyance facility between the Bureau of Reclamation Central Arizona Project Granite Reef Aqueduct and the Salt River Project canals at Granite Reef Dam. The interconnection design included pressure conduits designed for a head of 54.9-meters; acoustic flow meters; fixed cone and butterfly valves; open channel lined canal; prestressed concrete pipe inverted siphon; flume overchute; and radial gates designed for remote control operation. Engineering services included: design studies of alternatives; final designs, construction drawings, specifications, and bid documents; planning for future hydropower; geotechnical investigations, surveying, and reviewing contractor submittals for the Salt River Project.

From: January 1984 To: December 1987

Employer: Engineering Consultants International

Positions held: Senior Hydropower Engineer

**Wadaslintang Dam and Hydropower Project, Indonesia** Senior power plant engineer responsible for providing home office support; preparing and evaluating design modifications required during construction; reviewing and evaluating turbine and generator manufacturers' designs and drawings; coordination with civil and structural designs and layouts; reviewing and analyzing contractor prepared designs and drawings for precast, post-tensioned roof beams; second stage concrete and reinforcement; and reviewing designs, drawings, and fabrication methods for the composite post-tensioned concrete girder spillway bridge. Prepared preliminary and final designs, drawings, specifications, and cost estimates for a 57.9-meter long, two-span composite precast, post-tensioned, concrete I-girder bridge designed according to AASHTO specifications.

From: December 1983 To: August 1984

Employer: Engineering Consultants International

Positions held: Senior Hydropower Engineer / Senior Structural Engineer

**Mayush Hydroelectric Project, Peru, South America** Senior power plant and structural engineer responsible for overall project coordination, design and drawing production and preparing layouts, structural design, tender document drawings and technical specifications, and coordination of drawing

preparation for a 150-MW (3-unit) underground hydroelectric powerplant, 21 km of power tunnels, concrete gravity diversion dams, gated intake structures, outlet structures, sand traps, and access bridge.

From: August 1983 To: November 1983

Employer: Engineering Consultants International

Positions held: Project Manager / Senior Hydropower Engineer

**Central Arizona Project/Salt River Project Hydropower Interconnection Study, Arizona.** Project manager and senior power plant engineer responsible for coordination and preparing layout studies, hydropower evaluation, hydraulic design, cost estimates, and report for an interconnection facility (with or without hydropower development) between the U.S. Bureau of Reclamation (USBR) Central Arizona Project Granite Reef Aqueduct and the Salt River Project at Granite Reef Diversion Dam.

From: March 1982 To: July 1983

Employer: Engineering Consultants International

Positions held: Senior Hydropower Engineer / Structural Engineer

**Baligatan Hydropower Project, Philippines.** Senior power plant and structural engineer responsible for overall project coordination and preparation of layouts, final designs, stability analysis, structural design, and construction drawings, and review of electrical and mechanical drawings for construction of a 6-MW powerplant addition to the irrigation outlet works at the 47 m high Baligatan Dam which is part of the Magat River Multipurpose Project.

From: June 1982 To: August 1982

Employer: Engineering Consultants International

Positions held: Senior Hydropower Engineer

**Fresno Dam Small Hydro Project, Montana** Power plant engineer responsible for preparing layouts of alternative schemes, preliminary designs, analysis of technical feasibility, assessment of switchyard and transmission line locations, and evaluation of the existing dam, spillway, outlet works, and adjacent areas to accept the proposed 4.3 MW powerhouse, penstock and tailrace.

From: January 1982 To: December 1983

Employer: Engineering Consultants International / AECOM

Positions held: Senior Hydropower Engineer

**Wadaslintang Dam and Hydropower Project, Indonesia.** Senior power plant engineer responsible for preparing general arrangement drawings, preliminary civil and structural designs, stability analyses, electro-mechanical equipment and civil works, layout drawings and tender documents for a 16 MW (2-unit) hydroelectric powerplant with integral irrigation outlet works, switchyard, and access road.

From: June 1982 To: October 1982

Employer: Engineering Consultants International

Positions held: Senior Hydropower Engineer

**Black Bush Small Farms Drainage Development and Rehabilitation Project, Government of Guyana, South America.** Structural engineer responsible for preparing layouts, structural design, stability analysis, foundation designs and tender drawings for construction of five drainage pumping plants and sea sluices with timber pile foundations for an existing canal drainage systems utilizing surplus vertical turbine pumps.

From: May 1982 To: October 1982

Employer: Engineering Consultants International  
Positions held: Senior Hydropower Engineer

**Cochiti Dam Hydropower Project, New Mexico** Power plant engineer responsible for preparing and coordinating reconnaissance level investigations of 5 alternative development schemes to determine the optimum installation at the existing flood control dam. A detailed feasibility analysis was performed for the selected alternative to further examine the technical, economic, financial, environmental and socio-cultural aspects of the project. Prepared preliminary designs and documentation use by the U.S. Corps of Engineers to determine if they should proceed with detailed design.

From: March 1979 To: November 1980

Employer: U.S. Bureau of Reclamation  
Positions held: Senior Hydropower Engineer

**Hoover Dam Hydropower Project, U.S. Bureau of Reclamation, Arizona and Nevada.** Senior Power Plant Engineer responsible for project coordination and preparing layouts, designs, quantity estimates, and final report for a feasibility study to add a 500-MW surface or underground power plant at Hoover Dam.

From: January 1972 To: July 1979

Employer: U.S. Bureau of Reclamation  
Positions held: Senior Hydropower Engineer

**Central Arizona Project, Salt River Project/U.S. Bureau of Reclamation, Arizona.** Senior Project Engineer responsible for preparing designs and contract drawings for construction of three 85 cms relief pumping plants to supply water to nearly 400,000 hectares of Indian and non-Indian irrigated agricultural land areas in southern Arizona and New Mexico and 620 million cubic meters of municipal and industrial water for the Cities of Phoenix and Tucson. Water diverted from the Colorado River in northern Arizona was lifted 244 meters by the first pumping plant to the inlet portal of the Buckskin Mountains Tunnel where it began its 304-kilometer long journey to Phoenix.

From: January 1980 To: December 1981

Employer: U.S. Bureau of Reclamation  
Positions held: Senior Hydropower Engineer

**Assessment of Small Hydroelectric Development at Existing Facilities, U.S. Bureau of Reclamation, Western United States.** Hydropower Engineer responsible for evaluation of U.S. Bureau of Reclamation projects based on technical and economical analyses. Project sizes ranged from 0.58 MW to 15 MW with heads from 3 to 152 meters.

From: May 1981 To: October 1981

Employer: U.S. Bureau of Reclamation  
Positions held: Senior Hydropower Engineer

**Norden Dam Hydropower Project, U.S. Bureau of Reclamation, Nebraska.** Senior Power Plant Engineer responsible for project coordination, plant layout drawings, preliminary design, identification, evaluation of technically feasible alternatives, and assessment of existing facilities to accommodate a 10-MW development at the existing facilities.

From: February 1981 To: June 1981

Employer: U.S. Bureau of Reclamation  
Positions held: Senior Hydropower Engineer

**Boise River Diversion Dam Hydropower Project, U.S. Bureau of Reclamation, Idaho.** Senior Power Plant Engineer responsible for project coordination, evaluation of alternative project arrangements and intake design, preparing preliminary designs and drawings, and assessing impacts on the existing facilities of the existing 10-meter-high 5-MW diversion dam.

From: January 1973 To: July 1974

Employer: U.S. Bureau of Reclamation  
Positions held: Senior Structural Engineer

**Mount Elbert Pump Generating Plant, Fryngpan-Arkansas Project, U.S. Bureau of Reclamation, Colorado.** Structural Engineer responsible for preparing second-stage concrete and reinforcement designs, drawings, and specifications for a 2-unit, 200-MW pumped storage plant.

From: January 1971 To: December 1971

Employer: U.S. Bureau of Reclamation  
Positions held: Senior Structural Engineer

**Teton Power and Pumping Plant, Teton Project, U.S. Bureau of Reclamation, Idaho.** Structural Engineer responsible for preparing designs and construction drawings for a reinforced concrete structure housing four 10-MW generators and six pumping units with a total capacity of 2.3 cms at a rated head of 98.5 meters.

From: January 1972 To: December 1977

Employer: U.S. Bureau of Reclamation  
Positions held: Project Engineer

**Westlands Water District and Colusa County Water District, Central Valley Project, California; Spokane Indian Reservation Water Resource Development, Columbia Basin Project, Washington; Navajo Indian Irrigation Project, New Mexico; and Manson Unit, Chief Joseph Dam Project, U.S. Bureau of Reclamation, Washington.** Project Engineer responsible for coordinating projects and preparing designs, construction drawings, specifications, and bid documents for construction of numerous wet well and slab type pumping plants and pipeline distribution systems for agricultural irrigation projects throughout the western United States.



<p>ensure the physical conditions are satisfactory and if necessary identify replacement sites for those that are found to be unsuitable.</p> <p>ii Planning and detailed design of each installation and preparation of tender documents, including specifications for both the civil and M&amp;E works, drawings, BoQ and a separate “Engineer’s Estimate”.</p>	<p>head data, power generation analysis, construction cost estimates and economic analysis for addition of hydroelectric facilities at three existing irrigation water supply dams. Turbine sizes ranged from 2.6 MW to 5.0 MW.</p> <p>3. <b>Jons Drop Hydropower Feasibility Study, Wyoming Water Development Commission, Wyoming (2006).</b> Lead Hydropower Engineer responsible for conducting a feasibility study of a potential small hydropower facility to replace a drop on an existing canal system. The existing drop is designed to convey a maximum of 2 cms with a gross head of about 21.3 meters. Alternatives evaluated varied from 125 kW to 340 kW depending on the design flow.</p> <p>4. <b>Lake Dorothy Hydroelectric Project, Alaska Electric Light and Power, Alaska. (2005)</b> Project Manager responsible for directing the preparation of final designs, drawings and specifications for a 45 MW high head hydroelectric facility located near Juneau. The project is owned by Alaska Electric Light and Power and includes a three unit powerhouse located at tide water, 3.2-kilometer long access road through rugged terrain, 2.7-kilometer long 1524-millimeter diameter welded steel penstock, rockfill dam, tunnel and lake tap. The project is wholly on U.S. Forest Service land and licensed by the Federal Energy Regulatory Commission.</p> <p>5. <b>Magalia Reservoir Raw Water Bypass, Paradise Irrigation District, California (2005)</b> Project Manager responsible for coordination and technical oversight of a feasibility study to add hydropower to Paradise Dam combined with a pipeline bypass around Magalia Reservoir to address water quality issues during reconstruction of Magalia Dam. Also coordinated and directed preparation of a FERC preliminary permit application for the Paradise Irrigation District to secure their right to study the hydropower project for potential development.</p> <p>6. <b>Boulder Canyon Hydroelectric Feasibility Studies, City of Boulder, Colorado. (2003 to 2005)</b> Project Director responsible for administration and technical review of feasibility studies to identify and evaluate alternatives for addition of hydropower to the existing Barker Dam and</p>
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	<p>Middle Boulder Creek water supply system. The system includes dams, pipelines, pressure reducing stations and an existing hydroelectric plant. Initial studies included estimates of potential generation capability, estimated construction costs, and revenues. Also included was an assessment of FERC permitting requirements for each potential alternatives.</p> <ol style="list-style-type: none"><li data-bbox="657 514 1409 808">7. <b>Conroe Dam Hydroelectric Feasibility Study, San Jacinto River Authority, Conroe, Texas. (2004)</b> Project Director responsible for administration and technical review of a feasibility study to identify and evaluate alternatives for addition of hydropower to the existing dam. The study included development of flow duration curves, energy studies, turbine optimization, conceptual facility design, cost estimates, electrical revenue estimates, and economic analyses.</li><li data-bbox="657 892 1409 1291">8. <b>Greybull Valley Irrigation District Hydropower Feasibility Study, Wyoming Water Development Commission, Wyoming. (2002 to 2004)</b> Project Director responsible for administration and technical review for an irrigation based hydropower generation feasibility study. The system includes three dams and two canal drops with potential for hydropower. The study examined the possibility of enclosing the canal drops into pipe drop structures as potential hydropower sources along with the addition of hydropower at the dam outlet structures. The study included an analysis of power markets and power grids in the project area.</li><li data-bbox="657 1312 1409 1711">9. <b>City of Cheyenne Hydropower Feasibility Study, Wyoming Water Development Commission, Wyoming. (2002 to 2004)</b> Project Director responsible for administration and technical review for a municipal water supply system hydropower generation feasibility study. The City of Cheyenne municipal water system has several areas with significant head pressure reduction. The project included an inventory and evaluation of the entire raw and treated water system to identify all sites with hydropower potential. Economic and financial analyses were completed to identify the most promising sites for further study.</li><li data-bbox="657 1732 1409 1896">10. <b>Wiwili Dam and Hydroelectric Project, United Nations Development Program, Nicaragua (1998 to 1999).</b> Principal Structural Engineer responsible for technical review and providing design assistance to EDICO, a local consulting firm, for a United Nations Development</li></ol>
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	<p>Program funded small, rural hydroelectric project in a very remote location in northern Nicaragua. The project includes 15-kilometers of access road, a 10-meter high concrete gravity diversion dam with side channel spillway, multi-level intake, sediment sluice and rock trap, a 1.1-kilometer long, 1.0-meter diameter low pressure pipeline/penstock, and a 1.4 MW, twin turbine, powerhouse with net head of 130 meters.</p> <ol style="list-style-type: none"><li data-bbox="662 478 1399 1012">11. <b>Logan First Dam Project, Utah State University, Utah (1995 to 2002).</b> Project Manager responsible for directing a review of designs developed by the previous consultants, identification of acceptable modifications and evaluation of additional or substitute alternatives to modify and upgrade the existing 9.1-meter-high Ambursen buttress concrete dam and spillway to safely pass the PMF, withstand shaking from earthquake loading and survive displacement from a fault on the left abutment. The preferred rehabilitation alternative includes an RCC buttress to prevent sudden failure of the dam, RCC overtopping protection to prevent erosion, relocation of the powerhouse and installation of a 300 kW Kaplan turbine to replacement to old Francis turbine, and addition of pneumatic leaf gates to improve operation and enhance capacity of the spillway.</li><li data-bbox="662 1033 1399 1528">12. <b>Lakewood Pipeline and Hydropower Project, City of Boulder, Colorado (1990 to 2005).</b> Project manager responsible for supervising and directing a team in the preparation of conceptual, preliminary and final designs for replacement of 17.7-kilometers of 762- and 914-millimeter diameter high pressure welded steel water supply pipeline across private and federal lands and construction of a 3.5 MW, 549-meter-head, hydropower facility for the City of Boulder. Initial responsibilities involved providing engineering support and alternative evaluation for preparation of an EIS by the U.S. Forest Service. Subsequent phases have involved preliminary designs of several alternatives and preparation of final designs, drawings, specifications, cost estimates, contract documents and construction management.</li><li data-bbox="662 1549 1399 1879">13. <b>Silver Lake Pipeline and Hydroelectric Project, City of Boulder, Colorado (1995 2000).</b> Project manager responsible for directing and supervising a team in preparation of permits and conceptual, preliminary and final designs drawings and specifications for replacement of 5.6 km of existing gravity flow pipeline with a new 762 mm diameter high pressure steel water supply pipeline, in an alpine environment, and construction of a 3.2 MW high head (366 m) hydropower facility for the City of Boulder.</li></ol>
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	<p><b>14. Bisri Dam and Hydroelectric Project, Lebanon (1994 to 1998).</b> Principal structural engineer and technical reviewer responsible for directing preparation of feasibility and final designs, drawings, specifications and cost estimate for construction of 74-meter-high composite RCC/earth embankment dam, spillway, outlet works and hydroelectric powerplant on the Bisri River, 32-kilometers east of Beirut. The dam design includes a unique RCC spillway in the center of the earthfill embankments.</p> <p><b>15. Taylor Draw Dam and Hydroelectric Project, Rio Blanco Water Conservancy District, Colorado (1991 to 1998).</b> Project Manager and principal structural engineer responsible for directing and supervising a general consulting services contract with the Rio Blanco Water Conservancy District to review and monitor design and construction of stilling basin rehabilitation, spillway enlargement, dam raise and addition of a 3MW hydro plant. Technical assistance included analysis of the sliding stability of the reinforced earth spillway on the rock foundation, evaluation and repair of buckled conduit liner, development and monitoring of construction to repair spalling and deteriorated concrete in the spillway, evaluation of a leaking draft tube gate, and preparation of a comprehensive O&amp;M manual for the dam, spillway and outlet works.</p> <p><b>16. Wadasintang Dam and Hydropower Project, Ministry of Public Works, Directorate General of Water Resource Development, Indonesia (1984 to 1987)</b> Senior power plant engineer responsible for preparing and evaluating design modifications required during construction; reviewing and evaluating turbine and generator manufacturers' designs and drawings; coordination with civil and structural designs and layouts; reviewing and analyzing contractor prepared designs and drawings for precast, post-tensioned roof beams; second stage concrete and reinforcement; and reviewing designs, drawings, and fabrication methods for the composite post-tensioned concrete girder spillway bridge. Prepared preliminary and final designs, drawings, specifications, and cost estimates for a 57.9-meter long, two-span composite precast, post-tensioned, concrete spillway bridge.</p> <p><b>17. Baligatan Hydropower Project, National Irrigation Administration, Philippines (1982 to 1983).</b> Senior power plant and structural engineer responsible for overall project coordination and preparation of layouts, final designs, stability analysis, structural design, and construction drawings, and review of</p>
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	<p><b>electrical and mechanical drawings for construction of a 6-MW powerplant addition to the irrigation outlet works at the 47 m high Baligatan Dam which is part of the Magat River Multipurpose Project.</b></p> <p>18. <b>Fresno Dam Small Hydro Project, Montana (1982).</b> Power plant engineer responsible for preparing layouts of alternative schemes, preliminary designs, analysis of technical feasibility, assessment of switchyard and transmission line locations, and evaluation of the existing dam, spillway, outlet works, and adjacent areas to accept the proposed 4.3 MW powerhouse, penstock and tailrace.</p> <p>19. <b>Cochiti Dam Hydropower Project, Corps of Engineers, New Mexico (1982).</b> Power plant engineer responsible for preparing and coordinating reconnaissance level investigations of 5 alternative development schemes to determine the optimum installation at the existing flood control dam. A detailed feasibility analysis was performed for the selected alternative to further examine the technical, economic, financial, environmental and socio-cultural aspects of the project. Prepared preliminary designs and documentation use by the U.S. Corps of Engineers to determine if they should proceed with detailed design.</p> <p>20. <b>Assessment of Small Hydroelectric Development at Existing Facilities, U.S. Bureau of Reclamation, Western United States. (1980 to 1981).</b> Hydropower Engineer responsible for evaluation of U.S. Bureau of Reclamation projects based on technical and economical analyses. Project sizes ranged from 0.58 MW to 15 MW with heads from 3 to 152 meters.</p> <p>21. <b>Norden Dam Hydropower Project, U.S. Bureau of Reclamation, Nebraska (1981).</b> Senior Power Plant Engineer responsible for project coordination, plant layout drawings, preliminary design, identification, evaluation of technically feasible alternatives, and assessment of existing facilities to accommodate a 10-MW development at the existing facilities.</p> <p>22. <b>Boise River Diversion Dam Hydropower Project, U.S. Bureau of Reclamation, Idaho (1981).</b> Senior Power Plant Engineer responsible for project coordination, evaluation of alternative project arrangements and intake design, preparing preliminary designs and drawings, and assessing impacts on the existing facilities of the existing 10-meter-high 5-MW diversion dam.</p>
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