Awarded Contracts for External Experts to Support the NIST World Trade Center (WTC) Disaster Investigation

Contract No.	Awarded to	Date Awarded
SB1341-03-W-0714 (Area 2)	Dr. David M. Parks	6/24/2003

OUTSIDE EXPERTS FOR BASELINE STRUCTURAL PERFORMANCE, IMPACT ANALYSIS, STRUCTURAL RESPONSE TO FIRE, COLLAPSE, ETC.

Under solicitation number SB1341-03-Q-0322, firm fixed-price purchase orders have been awarded to experts in five technical areas for their experience and judgment at the most senior professional level to provide expert technical assistance as follows:

Area 2: Computational Mechanics for Aircraft Impact Analysis
A purchase order for Area 2 has been awarded to Dr. David M. Parks, an independent consultant. Dr. Parks is a world-class expert in the fields of computational and applied mechanics and the mechanical behavior of engineering materials. The specific tasks Dr. Parks will perform include:

- Provide expert technical assistance in identifying appropriate constitutive relationships and failure criteria for the various structural materials considered in the analysis of aircraft impacts into the WTC towers.
- Conduct in-depth, review and critique of the work done on the finite element analysis of aircraft impacts into the towers. The reviews shall include (1) the appropriateness of the models for their intended uses, and (2) the appropriateness of the impact analyses and the accuracy of the results including estimates of damage to the towers and dispersal of fragments.

Dr. Parks has over 30 years of experience in finite element analysis of fracture, plasticity, constitutive modeling, and material strain-rate sensitivity. Dr. Parks' primary technical interests are in the application of numerical methods to the analysis of fracture and inelastic deformation of materials, both at the structural and micro-structural levels. He has more than 120 publications over a broad range of topics. He served as a principal investigator on many research projects sponsored by government and industry. Examples of his consulting work include failure analysis of gas turbines using fracture mechanics-based 3-dimensional finite element modeling, analysis of failure of heat exchangers, and analysis of the failure of the welded beam-column connection following the Northridge earthquake. Dr. Parks has a doctorate in mechanical engineering and holds a position of Professor of Mechanical Engineering at the Massachusetts Institute of Technology in Cambridge, Massachusetts.

For the analysis of aircraft impact into the WTC towers, Dr. Parks will be providing expertise in the following areas:

- Nonlinear computational mechanics with emphasis on materials constitutive modeling, plasticity, dynamic plastic fracturing, material failure, and material strain rate sensitivity.
- Fracture mechanics and plasticity.
- Nonlinear finite element analysis including large deflections, plasticity, contact behavior, and failure of components (element erosion).