Technical Proposal

New Hampshire Departmen
Transportation

Spaulding Tur
Exit 10 Interchange S

Dover-Somersworth-Roch

Submitted by:

CHA
CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS

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August 27, 1993

RECEIVED
COMMISSIONERS OFFICE
AUG 27 1993
THE STATE OF NEW HAMPSHIRE
DEPT. OF TRANSPORTATION

Gilbert S. Rogers, P.E.
Assistant Director of Project Development
Chairman, Consultant Committee
New Hampshire Department of Transportation
P.O. Box 483
Concord, New Hampshire 03302-0483

Re: Technical Proposal, Project No. 11862
Spaulding Turnpike, Exit 10
Dover, Somersworth and Rochester

Dear Mr. Rogers:

Clough, Harbour & Associates (CHA) is pleased to submit our Technical Proposal for engineering services for the subject project. As requested, we have enclosed twelve copies of our proposal for your review.

CHA has extensive, in-house engineering and environmental capabilities to carry out a project such as the Spaulding Turnpike, Exit 10 Study. Because of this fact, our Project Team is a compact organization that will minimize coordination, promote efficiency/quality and facilitate management. Our subconsultants on this project are: RKG Associates, Inc. of Durham, NH; Victoria Bunker Inc. (WBE) of Alton, NH; The Preservation Company (WBE) of Kensington, NH; and an aerial mapping firm to be shortlisted based on qualifications and selected based on price and availability of resources (to expedite production).

CHA is able to offer the Department a very unique approach to this project due to the fact that we are a New Hampshire firm, yet we have not previously worked in the project study area. Accordingly, we will be able to offer a truly unbiased, and perhaps innovative, approach to a project that has already been addressed by numerous past studies. The fact that we have also not previously worked with any local organization or government will help us to build a study consensus as we bring no prior relationships to the project.

We look forward to meeting with you at our presentation on September 9th.

Very truly yours,

CLOUGH, HARBOUR & ASSOCIATES
Engineers, Surveyors, Planners
& Landscape Architects

R. M. Gardeski

Raymond M. Gardeski, P.E.
Principal-in-Charge

Roger T. Monsell, L.L.S.
Branch Office Manager

GWR/na
Enc.

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Section 1
Executive Summary

CHA is pleased to present this proposal for the study of a new Exit 10 interchange on the Spaulding Turnpike. CHA has the experience, professional expertise, and the design approach to provide NHDOT with total quality design services on this challenging project. Our Project Team can provide the Department with the following:

- **Unbiased Project Approach**
  The fact that CHA has not previously worked on a project in the study area or for any local agency or government means we will be able to approach the project without a preconceived opinion.

- **Compact Team**
  CHA has design capabilities in all disciplines required of the project. The fact that we do not have to work within an extensive "Team" for this project, will result in less coordination, a more efficient and quality design, and reduced costs to the Department.

- **Extensive Design Capabilities**
  CHA has a staff of over 300 professionals providing services in all disciplines required for the project. Our capabilities include: highways; bridges; traffic engineering; environmental studies; landscape architecture; surveying; hydrologic studies; wetlands; hazardous waste; geotechnical engineering; and public participation.

- **Local New Hampshire Office**
  Our Keene, New Hampshire office will be the project office for this assignment to provide for close liaison with the Department. This office is only a 60 minute drive from the Department's Concord offices and less than two hours from the project site.

- **Experienced Project Manager**
  Mr. Raymond Rumanowski, P.E., one of CHA's most experienced Project Managers, will be assigned to the Exit 10 project. Mr. Rumanowski has over 20 years of experience on major highway projects throughout the Northeast, including numerous projects in environmentally sensitive corridors with in-depth public participation programs. His recent experience includes assignment as Project Manager for an EIS of a new interchange on I-90 in a sensitive area of Albany.

- **Design Approach**

  Our design approach to the project is based on experience in very similar types of projects and our knowledge of the project area. The successful completion of the project will require a collaborative effort between the Department, the Tri-Cities, the community, and Clough, Harbour & Associates. Open lines of communication between all involved parties will also help to ensure a cost-effective, innovative, environmentally sensitive design that is implemented on schedule.

- **Wetland Capabilities**

  CHA provides extensive capabilities in wetland delineation, evaluation, mitigation, and replacement. We have been responsible for the replacement of wetlands on numerous projects and we are currently providing on-call wetland services throughout New York State for the NYS Office of General Services. We have also completed numerous wetland projects within the State of New Hampshire.

- **CADD Capabilities**

  CHA has developed comprehensive CADD capabilities to minimize design costs while providing a quality product. We have over 30 CADD workstations utilizing various CADD platforms that are networked throughout the firm.

- **Digital Terrain Modeling**

  CHA extensively uses digital terrain modeling (DTM) software to develop and analyze highway alternatives. Our DTM capabilities will greatly facilitate the development of a line and grade that not only minimizes the earthwork operations, but also optimizes the balancing of the earthwork for the project.

- **Commitment to Schedule**

  CHA's team members pride themselves on providing quality services while meeting clients' schedules and budgets. We have often been selected for project assignments based on our proven ability to meet very aggressive project schedules.

- **Commitment to Quality**

  CHA has a long-standing commitment of providing clients with quality services. Our existing quality assurance/quality control procedures include independent checking of all designs, independent reviews of contract documents by an engineering manager not directly involved in the day-to-day preparation of the documents, and constructability reviews performed by a member of our construction inspection group. In addition, we have instituted a Total Quality Management program that provides for a continual assessment of all our engineering and management processes and a mechanism whereby we are continually improving upon them.

Section 2
Project Management and Organization

Clough, Harbour & Associates has assembled a Project Team with the intent to meet the technical requirements of the assignment while facilitating coordination with the Department, other involved agencies, and within the team itself. We believe that the team of Clough, Harbour & Associates with RKG Associates, Inc., Victoria Bunker Inc., and the Preservation Company provides NHDOT with the full range and depth of technical and managerial skills required to accomplish these goals.

As the lead consultant, Clough, Harbour provides the Department with a firm that has been responsible for the coordination of numerous highway and environmental projects. Because CHA provides services in most disciplines required of the project, our Project Team includes only three other firms: RKG Associates, Inc., Victoria Bunker Inc., and The Preservation Company to provide specialized expertise.

The responsibilities of each firm are:

Clough, Harbour & Associates

- Project Management and Administration
- Highway and Traffic Engineering
- Structural Engineering
- Soils and Foundation Engineering
- Environmental Documentation
- Public Participation

RKG Associates, Inc.

- Socio-economic Impacts and Analysis

Victoria Bunker, Inc.

- Archaeological Studies

The Preservation Company

- Historic Studies

The Organization of Clough, Harbour

As Managing Partner of Clough, Harbour & Associates, Mr. Bill Harbour provides overall direction of engineering and administration on all the firm's projects throughout the northeastern United States.

Engineering direction and resource allocation is provided by the Operations Manager of each Service Group (Transportation, Buildings, Survey, Construction Management, etc.). Mr. Ray Gardeski, P.E. is responsible for all projects relating to bridges, highways and transportation systems. Depending upon the type and magnitude of a project, one of our key technical personnel is selected to service as Project Manager. The Project Manager is responsible for day-by-day client contact, and overall administration and engineering coordination of the project.

All accounting and cost control is the responsibility of Mr. Dave Wahrlich, CPA, Clough, Harbour & Associates' Controller. He and his staff are responsible for maintaining management systems, preparing cost reports, and keeping the Principal-in-Charge advised of the financial status of the project. Current charges are reported to the Project Manager on a semi-monthly basis. These reports are computer-generated and can be prepared for any level of detail required. Charges are compared against budget projections on both a per-period and cumulative basis.

Project Team Organization

The successful accomplishment of this assignment will require the commitment of personnel who are experienced in project management and who have in-depth experience in all of the diverse technical specialties that are required. Our proposed project organization is shown on the following page.

We have assembled an integrated team which allows for both a clear division of responsibility and authority, as well as a reasonable span of control for each of the key project engineers. We believe it is vitally important to establish strong working groups with well defined lines of authority and responsibility. Each manager will be responsible for interfacing all the activities of his group with the balance of the organization. One of the primary functions of the Project Manager will be to verify that such interfacing and interaction is occurring in a timely fashion.

We propose to utilize five discipline groups on this project: highway engineering; traffic engineering; bridge engineering; environmental planning and engineering; and surveying. Each group will be led by a group leader reporting directly to the Project Manager. Implementation of our Quality Control Program will be the responsibility of our Project Manager with oversight, checking and assistance provided by our company-wide Quality Control Manager.

The five groups shown on our organization chart have the following functions:

- **Environmental** - This group will be responsible for obtaining all environmental documentation/permits/studies required of the project and for implementation of a public participation program. Interaction with DES, COE, EPA, SHPO, and other environmental agencies, as well as the Tri-Cities and local community groups will also

CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS

THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

Project Manager
Raymond Rumanowski, P.E.

Principal-In-Charge
Ray Gardeski, P.E.

Survey & Mapping
Roger Monsell, L.L.S.

- *Project Surveyor* — **Bill Cadmus**
- *Right-of-Way* — **Roger Monsell, L.L.S.**
- *Photogrammetry* — **Subconsultant**

Project Environmental & Public Participation
Peter Conway, RLA

- *Socio-Economic* — **RKG Associates, Inc.**
- *Natural Resources* — **Ed O'Hara, RLA**
- *Wetlands* — **Steve Wilson, Gene Webber, RLA**
- *Noise Quality* — **Wesley Ecker**
- *Air Quality* — **John Tozzi, P.E.**
- *Hazardous Waste* — **Margaret Scrodanus**
- *Cultural Resources* — **Preservation Co., Victoria Bunker, Inc.**

Project Highway Engineer
Tom Karis, P.E.

- *Highway Design* — **Gary Robinson, P.E., Wesley Ecker**
- *Hydraulics* — **Rob Hitchcock, P.E.**
- *DTM Modeling* — **Joe Lukovits**

Project Traffic Engineer
Peter Faith, P.E.

Tom Johnson, Wendy Parker

Project Structural Engineer
Mark Olstad, P.E.

- *Bridge Design* — **Rob Sipzner, P.E., Kathy Bentley, P.E.**
- *Geotechnical* — **Rick Loewenstein, P.E., Carsten Floess, P.E.**

ORGANIZATION CHART

be carried out by the group. Interaction with local officials of Somersworth, Rochester and Dover to achieve a project consensus will be important to the success of the project. Key environmental concerns on this project are expected to be air quality, wetlands, and displacements.

- **Highway Engineering** - This group will be responsible for the development of all alternatives for the Exit 10 interchange, as well as any other roadway work required of the project. Development of the enhanced digital map database inclusive of a digital terrain model will also be carried out by the highway engineering team. Important aspects of the project will include: floodplain impacts; minimizing wetland disturbance; avoidance of residential displacements; and maintaining the rural character of the corridor.

- **Traffic Engineering** - In conjunction with the SRPC, this group will develop traffic assignments and projections for all project alternatives. Volume/capacity and level of service analyses will also be developed for all key area roadways. This group will also collect any traffic counts and turning movements needed to supplement the SRPC model.

- **Bridge Engineering** - This group will be responsible for developing conceptual designs and cost estimates for all bridges, culverts and retaining walls required of the project. All geotechnical work will also be carried out through this group.

- **Surveying** - Working closely with the highway design group, the survey group will be responsible for production of base mapping for the project. They will contract and manage an aerial mapping subconsultant to produce the base mapping. Collection of data on corridor right-of-way and property boundaries will also be carried out by this group. The survey group will also be responsible for field verification of all utilities, staking soil boring locations, etc.

Project Management

Project Management's objective is to develop, on time and within budget, a complete and qualitative set of contract documents in conformance with the client's objectives, criteria, and instructions.

In any planning and design effort, successful management must ensure the establishment of communications and coordination between the various parties involved in the project. Such communication is of paramount importance and must be established at the beginning of the work to define all goals, objectives, interrelationships, and the technical requirements of the project. This can be effectively accomplished only by the adoption of appropriate management and control procedures.

During the design effort, continuing communication and coordination is required, and is obtained through meetings, progress reports, and consultation with NHDOT to review the progress and to bring out for discussion all conflicts and problem areas. Revisions required to individual task assignments will be made only after review by management personnel and the Department.

Project Manager

Mr. Raymond Rumanowski, who has over 20 years of experience in environmental studies, design and construction of highways will be the Project Manager for this assignment. Mr. Rumanowski has been responsible for major highway environmental impact studies and design. He has acted as Project Manager for the $50 million reconstruction of the I-90/I-87/Exit 24 Thruway Interchange in Albany, NY; $40 million construction of a new interchange with I-890/Exit 26 Thruway Interchange including a new roadway and 700 foot structure over the Mohawk River in Schenectady County, NY; environmental studies and design of 5.5 miles of New York Rte. 74 in the environmentally sensitive and rigidly controlled Adirondack Park in Essex County, NY. He has also been responsible for supervision of the EIS and preliminary design of the I-90/Exit 8 new interchange and connecting roadways in Rensselaer County, NY.

As Project Manager, Mr. Rumanowski will be in overall control of the project. His responsibilities will include:

- Coordination of the firms and the various disciplines involved in the project.
- Insuring that the objectives of the project are achieved.
- Formulating, monitoring and maintaining cost, schedule and quality control.
- Directing liaison with NHDOT and all other agencies concerned with the project.
- Supervising the progress for the entire staff.
- Representing the Project Team at meetings and presentations.
- Preparation of all status and progress reports, reviewing technical formulations and methods of analysis, and quality controlling all drawings, specifications and estimates.

Project Personnel

The project staff required to adequately control, coordinate, and implement the Project is illustrated on our organization chart. The staff assembled will provide the finest professional talent in the areas of: management; highway design; geotechnical, traffic and bridge engineering; surveying; and environmental documentation. Our key personnel will coordinate a support staff of designers and technicians highly qualified in their respective areas of expertise. The personnel assigned to this project have been selected based on their availability, experience, and also for project specific reasons (i.e., our Project Manager's experience on similar projects).

The Work Schedule

Timely completion of the project is a major concern and objective of the project team. Our proposed project schedule is included in Section 4 of our Proposal. We will prepare and work from a detailed resource loaded schedule which will be designed to accomplish the work within this period of performance.

Project Meetings

The management team, consisting of the Project Manager and all Project Engineers will meet on a regular basis (normally every two weeks) to review the technical design and to coordinate the activities of the project. These meetings, which will occur throughout the project, will be coordinated by the Project Manager. Other informal meetings between individuals and disciplines will obviously occur throughout the Project.

Management Information Systems

Management techniques and procedures which we propose to use are supported by a number of Management Information Systems which are a routine part of Clough, Harbour & Associates' Organization. These systems are utilized to varying degrees, depending on the complexity and size of the project. These systems include:

- Progress Reporting
- Cost Control
- Criteria Control

Progress reporting systems maintain updated networks or more simplified charts of each project. Bi-weekly progress reports are submitted by each discipline to the Project Manager who, in turn, summarizes the total data into a "Project Summary Report". These reports are forwarded to the Principal-in-Charge for his evaluation. Using this procedure, impending schedule changes are thus automatically identified. Networks may be maintained manually or by computer depending on the scope and complexity of the specific project.,

A fully controlled system of expenditure reporting is maintained by the Office of the Controller. This system provides weekly reports of manhours and dollars expended by discipline and by the project. Detailed analysis of the expenditures by sub-tasks can be obtained with this system, should it be desired. Expenditure reports are forwarded to both the Principal-in-Charge and the Project Manager for their evaluation.

QUALITY CONTROL SYSTEM

Overview

Quality control is an indispensable part of any project. Clough, Harbour & Associates recognizes the importance of quality in all our processes - design, document preparation, purchasing, measurement and testing, and cost and scheduling controls. Quality control procedures must include implementation of corrective action and maintenance of quality control records. CHA has an active Total Quality Services program which continuously defines, reviews and improves the processes encompassing all our operations.

Management Responsibilities

CHA's management staff leads and coordinates our quality control policies, and ensures that personnel at all levels understand, implement and maintain our defined Quality Control/Quality Assurance procedures. These procedures are discussed in more detail below, in each section as applicable. We believe that quality resides in the hands of the people doing the job. These people are given the knowledge of quality processes, and resources and procedures to utilize. We are committed to quality in all our operations, and all employees are responsible for certain aspects of quality control.

Our Chief Engineer and Manager of Quality and Training are senior management representatives with backgrounds in quality systems development, and with the authority and responsibility for ensuring the continuing development and implementation of our quality control system. The Chief Engineer has been instrumental in developing the quality control procedures listed below. He routinely performs in-house audits of in-progress projects to verify that these procedures are being utilized. Our Manager of Quality and Training has spearheaded the planning of CHA's Total Quality Program. He leads our Staff Education and Training program to give all employees the education, training and development they require (both quality education and technical skills development) to successfully execute their responsibilities.

Quality System Documentation

The basic quality control system we utilize on all projects is documented in our Quality Assurance/Quality Control Manual, Office Procedures Manual, and Project Management Manual. Since quality is a continually evolving process, supplements to these manuals are often developed and distributed. Furthermore, client requests for specific quality control documentation or reporting formats (i.e., Critical Path Method scheduling or task breakdowns to a specific level) often supplement CHA's basic quality procedures.

CHA's extensive quality control system which will be utilized on this project will be submitted prior to our start of work. This system will incorporate for this project:

a) The written procedures and instructions governing work on this contract.

b) Effective, verifiable implementation of these procedures and instructions.

c) Identification of equipment, software, resources and skills that CHA has acquired and will utilize to achieve the required quality.

d) Clarification of acceptance standards for all features and requirements in the Work Statement, including those which contain a subjective element.

e) Identification and preparation of quality control records relating to the work.

Design Control

CHA has established and routinely implements specific measures to control and verify the design to ensure that functional, safety and quality requirements are met to the full satisfaction of our clients, industry/governmental standards, and our stringent in-house specifications.

Crucial to design control is the coordination and interaction between CHA's separate design groups, subconsultants, outside agencies or organizations, and the client. Our Lead Project Manager has overall responsibility for all coordination efforts. To assist him/her in fulfilling that responsibility, our quality control system includes requirements for documentation of:

a) The Expanded Project Plan, which must identify, for each design group, their project scope, design criteria to be utilized, document format, team members, budgets and schedules for each phase, and QA/QC plan. This expanded plan is developed through input and interaction between all design groups and is mutually approved by all.

b) The Final (Task-Level) Project Plan, which includes design scope, schedule and budget monitoring at a task level. All design groups submit a Final Project Plan checklist, covering these items, to the Lead Project Manager.

c) Performance of Technical QA/QC Reviews within each design group at pre-determined design milestones. These reviews are performed by both the project manager within that design group and his/her supervisor.

d) Performance of Project QA/QC Reviews by the Lead Project Manager and Principal-in-Charge at pre-determined design milestones to verify proper coordination and integration of the work of all design groups and full responsiveness to the client's needs, project constraints, and design criteria.

e) Performance of Constructability Reviews at pre-determined design milestones. These reviews are performed by an engineering manager experienced in construction inspection who is otherwise unconnected with the project. He reviews contract plans and specifications to assure constructability, looking for ambiguities, omissions, inconsistencies and possible construction difficulties.

f) Design team meetings, held on a regularly scheduled basis, to coordinate and address all design issues.

Furthermore, project documentation must include:

a) Written documentation of all correspondence (with subconsultants, agencies/utilities, information suppliers, and the client).

b) Neat, thorough design calculations with the names of both the preparer and checker, and with complete references to applicable design criteria.

c) Final drawings and worksheets, with the names of the preparer, reviewer and checker. All worksheets must have the appropriate review signatures prior to advancing in the document preparation process.

Document Control

CHA has established procedures to control and maintain all project documentation. The documentation of completion of all Quality Control System procedures must be maintained by the project manager in a designated location. This is the first item verified by our Chief Engineer during his in-house audits of in-progress projects.

All project documents must be properly organized in their designated locations. Superseded or obsolete documents are promptly separated for storage away from current documents. The need for proper organization and maintenance of all records is well-understood; interim changes to design documents between re-issue are minimized, and status listings (either manual or computerized) of documents are maintained. All changes/modifications must be justified and documented, and are subject to the same reviews as the original version.

Purchasing

We have standard procedures developed to assure that all our suppliers (product vendors, subcontractors and subconsultants) meet our own rigid quality standards. We recently completed development of a pre-procurement interviewing process which verifies if prospective suppliers have a basic quality assurance system in place. Prior to selection, suppliers must demonstrate that they will be able to meet all project requirements - contractual, technical, quality control and documentation.

Design Cost and Schedule Controls

CHA has a full complement of cost and scheduling tools, which are utilized to monitor and control all projects. During Final (Task-Level) Project Planning, schedules and budgets for all tasks (and all phases, design groups and suppliers) are developed. This data is then entered into Plan/Trax 3 software, which verifies that the overall project budget and schedule can be met, and projects staffing requirements. Plan/Trax 3 can utilize either the Critical Path Method or Gantt Method.

Expenditure reports, detailing the dollars expended to date, are developed and distributed weekly by our business office. Expenditures are broken down by design group, project phase, and major tasks. Each design group project manager utilizes these reports, percent complete estimates and Plan/Trax 3 software to monitor his/her design group's progress. The Lead Project Manager similarly monitors the schedules and budgets of all design groups and suppliers. This system gives management the ability to quickly and accurately (through graphs and tables) assess project status and act to control any schedule or budget concerns at an early stage.

Construction Cost Schedule

An integral part of the design process is estimating and controlling projected construction costs during all design phases. We routinely provide at least four construction cost estimates throughout the project, namely the following:

a) Preliminary - estimated from the approximated costs of the major work items only with a percentage for miscellaneous items, or on a square-foot cost basis of typical construction types.

b) Advanced Design - an intermediate estimate, to verify conformance of the documents being developed with budgeted cost.

c) Pre-Final Design - typically performed at the 90% or 95% complete stage, prior to finalizing the construction contract documents.

d) Final Engineer's Estimate - our final estimate of the expected construction contract bid amounts.

The estimates allow for monitoring of the anticipated construction cost throughout design. Both the client and CHA then have the most up-to-date information to effectively control project costs.

Summary

The above outline of CHA's Quality Control System provided an overview of the processes and procedures we have implemented to assure the highest level of quality. These standard processes will be utilized on the subject project, as well as any additional procedures NHDOT requests at the start of work.

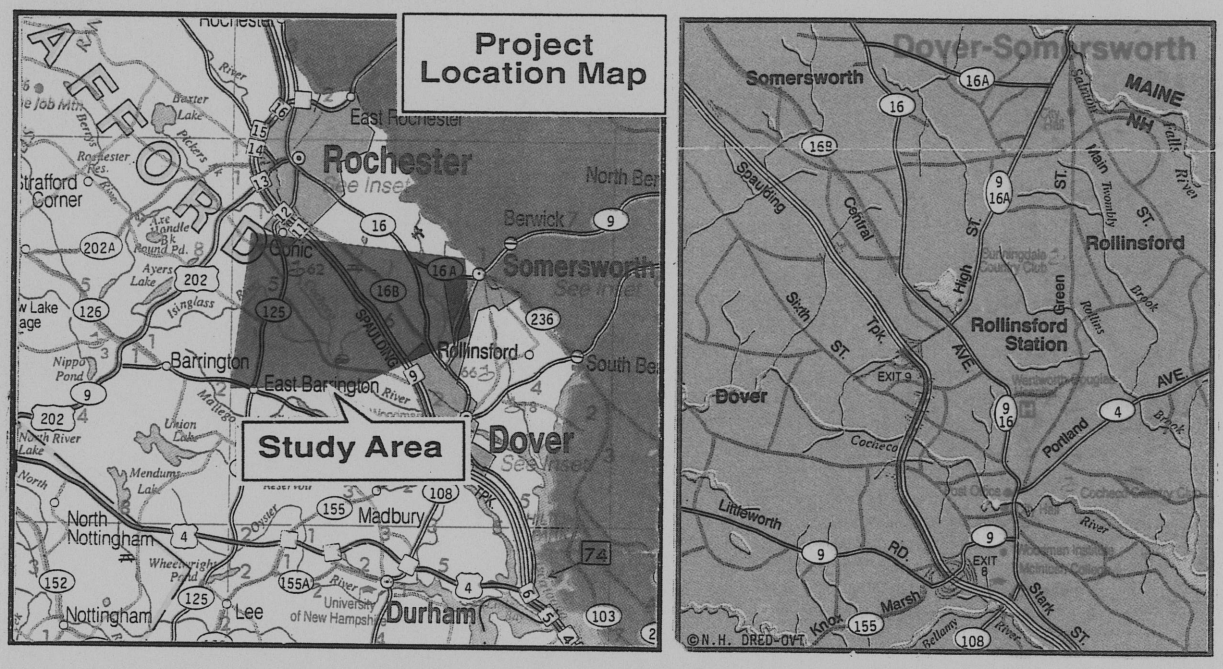
Section 3
Project Approach

Project Overview

The purpose of this project is to develop engineering alternatives for a new Exit 10 on the Spaulding Turnpike and to evaluate the alternatives for environmental impacts. The studies undertaken will need to satisfy all legal and environmental requirements such that a Design Public Hearing can be held that can result in the acquisition of right-of-way required to construct Exit 10. The project has been added to the State of New Hampshire 10-year plan under Senate Bill 446-A and Senate Bill 33-A.

Numerous past studies have been undertaken in the region, many of which dealt with the project corridor and some specifically with potential locations for Exit 10. These studies include: Concord-Spaulding Turnpike Study by NHDOT; Exit 10 Study by UNH for Tri-Cities Chambers of Commerce; City of Somersworth Master Plan Update; and the Pease Surface Transportation Master Plan. Significant data on existing conditions and environmental constraints can be found in these and other studies. This data will be utilized to minimize the cost of this project, and to allow the study team to concentrate on particular areas of concern.

One of the most important aspects of the project will be to develop a project consensus with the local community, businesses and local governments. The Tri-Cities of Rochester, Somersworth and Dover all have interest in the project regarding economic development potential, in addition to alleviating existing traffic congestion on key roadways. We feel our Project Team can effectively develop a project consensus, since we have not previously worked in the area and have no ties to any involved party. As we have not completed a study relative to the project area, we also have no need to reinforce or substantiate previous conclusions.



Agency Coordination

The Spaulding Turnpike Exit 10 Study is being implemented by the New Hampshire Department of Transportation. However, numerous other agencies, local governments, community groups, etc. will be involved in the project. This involvement ranges from review and approval authority (such as Corps of Engineers review of the Section 404 permit) to active interest in the location of the proposed interchange (for economic development) to passive interest (will the interchange affect my house?). In conjunction with the Department, we will ensure that all involved parties are kept fully informed of project development as it relates to their specific areas of concern. The following is a list of some of the more important agencies, groups, etc. who will be involved in the preliminary design. The list is not intended to include all parties who will be involved.

- **New Hampshire Department of Transportation (NHDOT)**
  Mr. Keith Cota, NHDOT Project Manager, will direct all efforts in conjunction with the Spaulding Turnpike Exit 10 Project. Other NHDOT personnel will be involved in the project concerning; right-of-way and surveys; geotechnical exploration program; existing and proposed utility locations; etc.

- **City of Somersworth**
  The City of Somersworth is very interested in the Exit 10 Study regarding alleviating traffic congestion on High Street and Weeks Circle and for the potential to develop vacant land along the Spaulding Turnpike for commercial/industrial users. Ms. Kathy Brown, Director of Planning and Economic Development is expected to be the key representative of Somersworth.

- **City of Rochester**
  The City of Rochester is also very interested in the location of Exit 10 for traffic relief and economic development. Convenient access to Skyhaven Airport would help to further develop the airport, as well as other commercial/industrial projects in the area (such as Granite State Business Park south of the airport). Mr. Peer Kraft-Lund, Director of Planning for Rochester is expected to be involved in the project.

- **City of Dover**
  The City of Dover is primarily concerned with improvements to Exit 9 and the construction of Exit 8A regarding traffic benefits and economic development within Dover. Though some access improvement may result to the commercial developments south of Long Hill Road with Exit 10, impacts to single family residences in the area are of more concern to Dover. Mr. Steve Stancel, Acting Planning Director, will likely be involved in the project.

- **Strafford Regional Planning Commission (SRPC)**
  As the local MPO, the SRPC will be actively involved in the study. Their extensive T-Model of the area will also provide the study with traffic assignments and projections for all project alternatives. It is also expected that the SRPC will participate in the Public Participation Program for the project. Mr. Steve Burns will direct the SRPC effort. Ms. Sarah Spittle was expected to lead the traffic modeling aspects of the project, but she is relocating to Keene and her replacement has not yet been named.

- **U.S. Army Corps of Engineers (COE)**
  The New England Division of the COE in Waltham, Mass. will be the review and issuing group for the Section 404 Permit involving stream and wetland impacts. Under Section 404(b)(1) of the Clean Water Act, the Corps of Engineers is required to determine the LEDPA, which is the alternative analyzed in the EIS determined by the Corps of be least damaging to wetlands and other environmental resources, is practicable to develop, and meets the purpose of the project.

- **U.S. Environmental Protection Agency (EPA)**
  The USEPA will review the Section 404 Permit as required by Section 404(b)(1) of the Clean Water Act and perform on-site inspection of wetlands after the final alignment and wetlands are staked in the field. The Concord, N.H. office of the US Fish and Wildlife Service will also provide consultation on stream crossings and review Stream Alteration Permits. The New Hampshire Fish & Game Commission will also review Stream Alteration Permits.

- **Federal Emergency Management Agency (FEMA)**
  The FEMA will review the Section 404 Permit Application and all hydraulic analyses to determine affects on existing floodplains. Cities/towns in the project area may also be involved in this review as it relates to their Zoning By-Laws.

- **New Hampshire Department of Environmental Services (NHDES)**
  The NHDES will review Stream Alteration Permits and comment on culvert designs, mitigation measures and erosion control measures. The Wetland Board of the DES will be involved in wetland permit approval.

- **New Hampshire Department of Agriculture**
  This agency, as well as other agencies, will be concerned with minimizing impacts to operating farmland and will review that recommendations are included in the EIS regarding highway runoff onto farmland and maintaining farm equipment access to operating farmland.

- **State Division of Historical Resources**

  The State Historic Preservation Office will review that the study complies with Section 106 of the National Historic Preservation Act regarding the effects of the project on National Register of Historic Places properties or on National Register eligible properties. Compliance also involves providing an opportunity for comment by the federal Advisory Council on Historic Preservation. The Determination of Eligibility (DOE) of historical properties will also be carried out through this agency.

Intersection of High Street and Blackwater Road

Blackwater Road in the vicinity of Spaulding Turnpike

Blackwater Road under Spaulding Turnpike

Spaulding Turnpike south of Blackwater Road Underpass looking south

PROJECT ISSUES

The following pages discuss some of the elements of the project that will need to be addressed during the study. Immediately after notice-to-proceed we anticipate a scoping meeting will be held with NHDOT to discuss these issues and to formulate a direction to be taken during preliminary design. This scoping meeting will also be used to establish lines of communication between the Department, CHA and all other involved agencies.

Discussions regarding review periods, NHDOT decision points and required input, permit applications, public meetings, etc. will also be held so that an agreed upon Project Schedule can be developed. We will modify the Project Schedule, as given in this proposal, based on these discussions and deliver the revised schedule within 10 working days after the kickoff meeting.

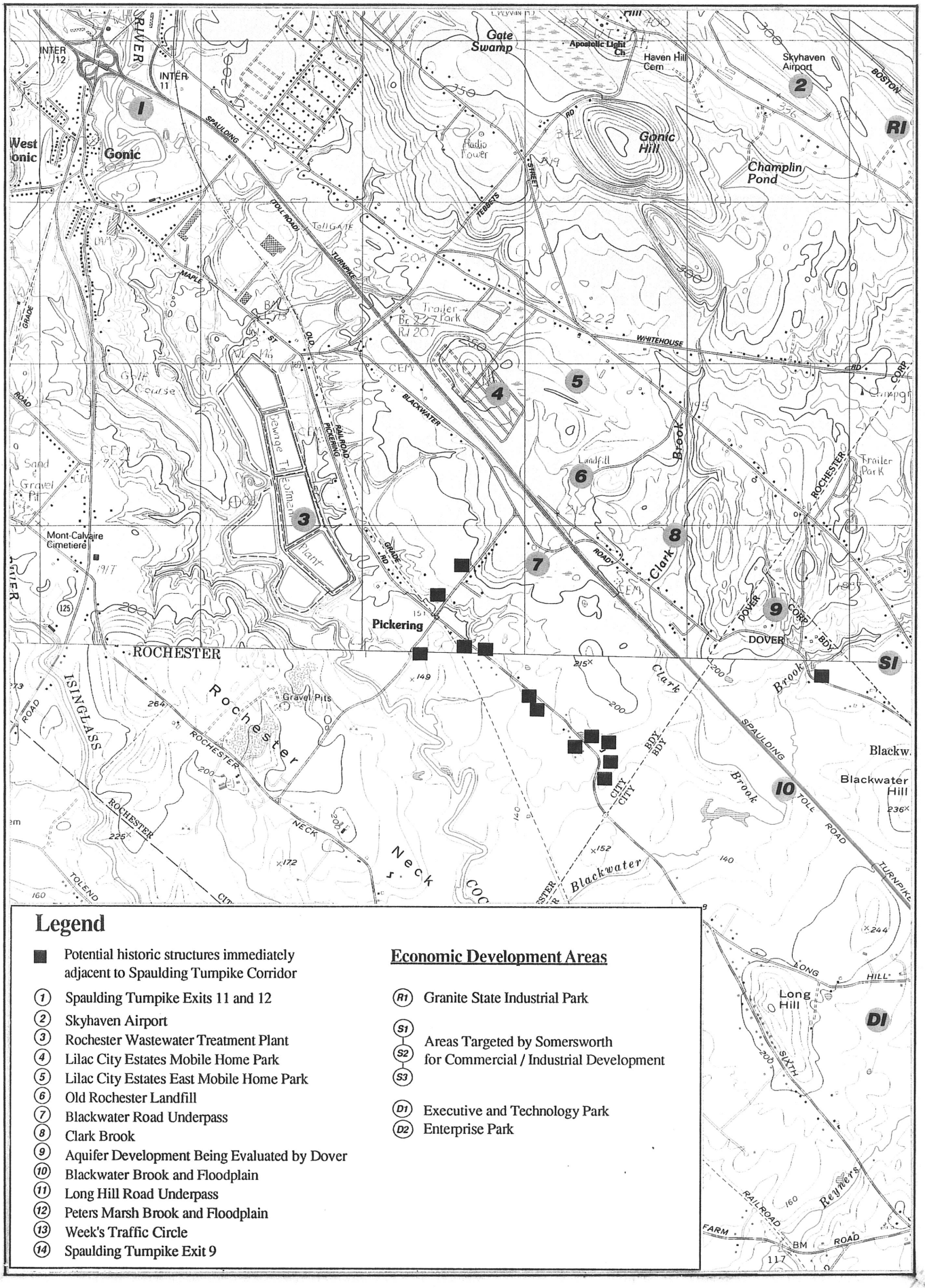
Project Corridor

As shown on the Project Location Map at the beginning of this section of the proposal, the project study area is a 12,000 acre site that extends from Somersworth on the east to Route 125 on the west. It is expected that Exit 10, plus all connecting roadways, will be physically located within this area. Traffic effects and development potential resulting from a new Exit 10 will extend beyond this area, and will be evaluated with the study.

The Spaulding Turnpike, within the project area, is a four-lane divided, limited access highway. The Turnpike traverses terrain that is primarily forested with rolling topography. The only development immediately adjacent to the Turnpike is residential housing: on the east side of the Turnpike along Varney Road; east and west of the Turnpike at the Blackwater Road crossing; and along the east side of the Turnpike at the northern limit of the project study area. Wetlands can be found throughout the corridor, as can brooks that encompass 100-year flood plains.

One of the primary tasks to be carried out during the initial phases of the project will be to identify all natural and cultural resources within the study area that could be impacted by the proposed construction. The resulting "Constraints Map" will be used to screen the impacts of proposed alternatives on all resources within the corridor. The ultimate objective of the project will be to develop a recommended design for Exit 10 that satisfies traffic and development considerations while minimizing impact on these resources.

The central portion of the project study area (inclusive of the Spaulding Turnpike) is shown on the following page. We have identified on this map some natural and cultural resources that will need to be considered during project development. The historical sites indicated are from the Concord-Spaulding Turnpike Study which primarily identified sites west of the Turnpike. Though one historical site is shown east of the Turnpike, more are expected to be found, particularly along Blackwater Road.



Legend

■ Potential historic structures immediately adjacent to Spaulding Turnpike Corridor

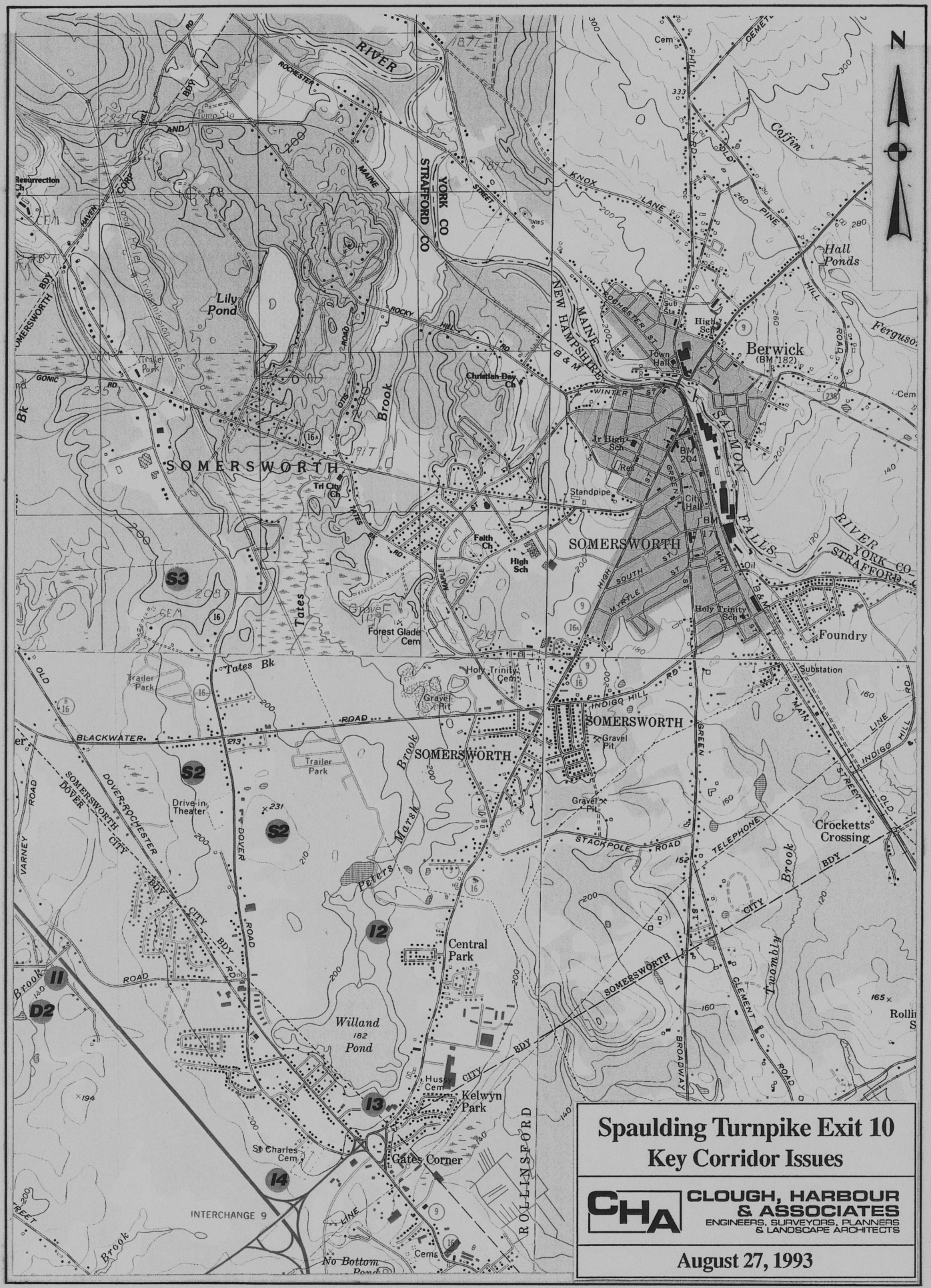
(1) Spaulding Turnpike Exits 11 and 12
(2) Skyhaven Airport
(3) Rochester Wastewater Treatment Plant
(4) Lilac City Estates Mobile Home Park
(5) Lilac City Estates East Mobile Home Park
(6) Old Rochester Landfill
(7) Blackwater Road Underpass
(8) Clark Brook
(9) Aquifer Development Being Evaluated by Dover
(10) Blackwater Brook and Floodplain
(11) Long Hill Road Underpass
(12) Peters Marsh Brook and Floodplain
(13) Week's Traffic Circle
(14) Spaulding Turnpike Exit 9

Economic Development Areas

(R1) Granite State Industrial Park

(S1) (S2) (S3) Areas Targeted by Somersworth for Commercial / Industrial Development

(D1) Executive and Technology Park
(D2) Enterprise Park



Spaulding Turnpike Exit 10
Key Corridor Issues

CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS

August 27, 1993

Public Participation

An active, well conceived Public Participation Program can make the difference between a smoothly executed project, and a project fraught with controversy and numerous starts and stops. For the Exit 10 project we assume that the Department will take the lead in the Public Participation Program with CHA providing all visual/presentation materials, as well as assisting in presentations. CHA has been responsible for numerous Public Participation Programs and is capable of providing any level of service desired by NHDOT. We expect that evaluation of the concerns of the Tri-Cities (Somersworth, Rochester and Dover) will be key in obtaining a successful conclusion to the project.

Public participation may take the form of community information meetings (involving local neighborhoods or communities), advisory task forces, public display of plans, public information meetings, project newsletters, meetings with public officials, and a public hearing. Our approach to developing the appropriate public participation techniques and graphics is by goals and objectives. We clearly establish the purpose of each meeting and identify objectives that must be accomplished to meet that need, whether it be information transfer, public input, conflict resolution, concept understanding, etc.

The development of adequate agency and public involvement techniques is based on project objectives and information needs. The following describes the development of various approaches that can be used:

- **Public Meetings and Hearings**
  Public meetings are useful for disseminating information, receiving information, or both. We can develop presentations, displays, workshop materials, brainstorming mechanisms, audio-visual materials, and questionnaires, in a manner that will best meet the objectives of the proposed meetings.

- **Displays**
  Plan displays are very useful in that they allow agencies and the public the opportunity to review project information and to ask questions about the project in an informal manner. Plan displays can be made available at any point during a project study process: prior to public meetings, scoping meetings, special purpose meetings, public hearings; or as a continuous display over a period of time.

  The type of displays that are utilized on a project are determined by: public involvement techniques being implemented; critical issues to be highlighted by the display; size and type of audience; and budget and scheduling constraints. We are prepared to assist the Department by providing the following as necessary: handouts or project overviews; photomosaic displays of project area showing environmental features; planimetric mapping showing alternatives and engineering details; typical sections, profiles and cross sections; transparencies and slides of displays; slides of aerial oblique photography and ground level photography; large-scale graphs and tabular information; computer-aided graphics (which allows many types of displays to be produced in large numbers showing different perspectives); and staff members with special expertise to answer questions.

- **Newsletters**

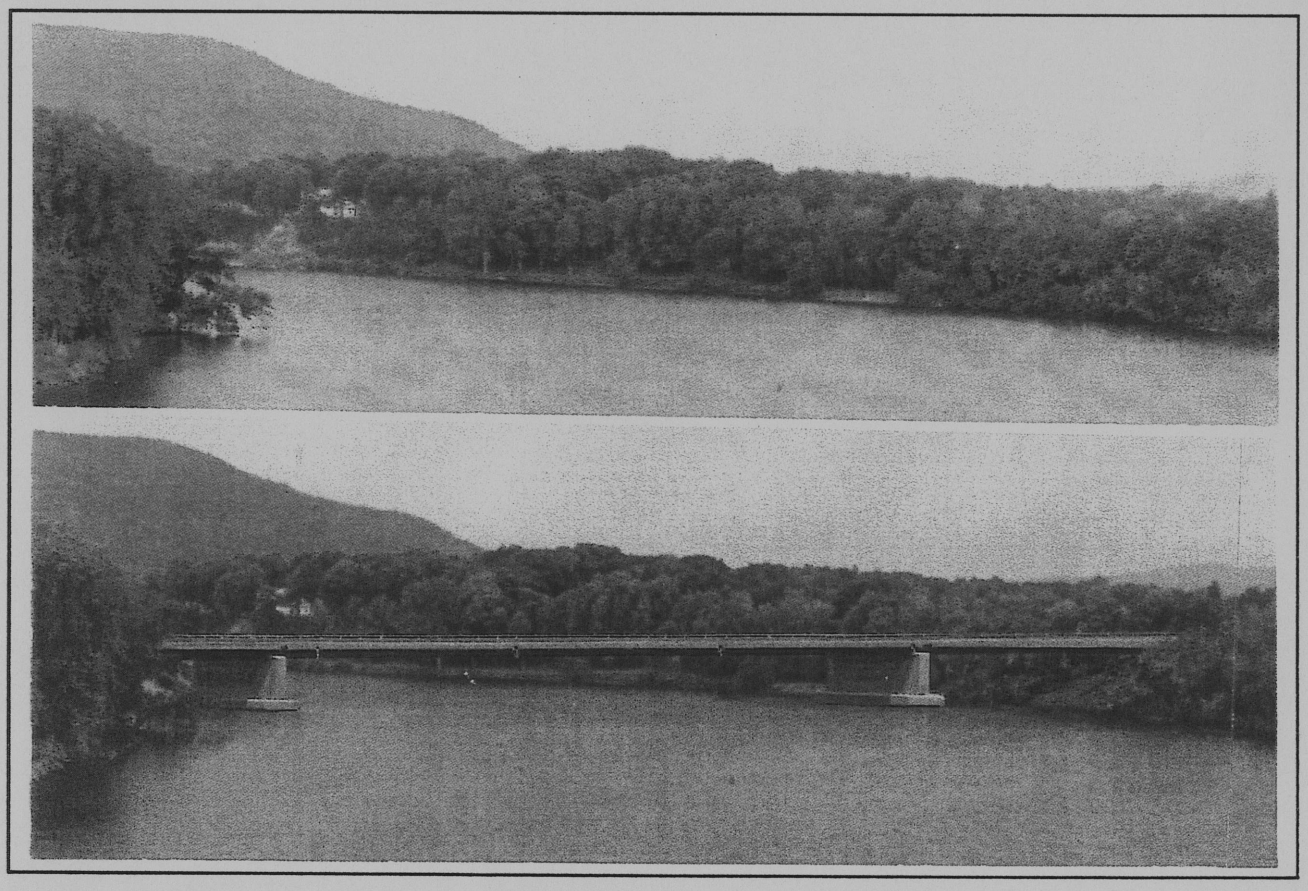
  Newsletters provide a useful technique for reporting study results and keeping agencies and the public informed about the progress of the studies throughout the project process. We prepare newsletters as necessary and appropriate in an easy to read, understandable format. They normally contain a number of graphics to help the reader understand the project. Newsletters are generally distributed to an audience of interested agencies and/or citizens, a list of which can be maintained by CHA. In appropriate situations, a questionnaire or survey is attached to the newsletter to further promote direct involvement by agencies and the public. CHA has complete in-house desktop publishing capabilities (including graphic scanning) for the production of newsletters.

- **Artist Renderings**

  In certain situations, artist renderings are useful because they clearly show the relationship between project alternatives and the landscape by providing panoramic views from critical viewpoints. We prepare artist renderings as appropriate by identifying critical views during the initial stages of a project. The artist prepares the rendering in sketch form for review by the Department prior to completing the final ink drawing.

- **Photo Simulation**

  CHA has extensively used photo simulation techniques to accurately depict the project's before and after views at public meetings. An example of this technique is shown below for a new structure crossing the Mohawk River in Schenectady County, NY. We have found this presentation technique very effective and well received by the public.



Project Mapping

To prepare the mapping needed for this project, it will be necessary to obtain new aerial photography of the areas to be mapped. The best time to obtain this photography is in the Spring following snow melt. The winter snow pack will have compacted ground cover and afford the stereocompiler with the optimum view of ground features. It is, however, important to obtain the photography required before new vegetation begins to grow. Experience in working in Southeastern New Hampshire has shown that early May is the latest practical date to obtain aerial photography for mapping. Aerial photography taken in the Spring of 1993 is available for most of the study area. This photography could be used for alternative investigations. Photography necessary to obtain mapping at a scale appropriate for design will be taken in Spring 1994.

Digital mapping at scales of 1"=200' and 1"=50' will be developed for the project in GDS Moss format using NHDOT Codes. Contouring of the mapping will be developed by Digital Terrain Modeling (DTM) (and not streamlines) which will facilitate development and evaluation of alternatives using CADD software, and also allow the mapping to be converted to "metric" (if needed in the future). Though Federal Funds are not currently envisioned to be used on the project, if they are used in the future (and the project is to be constructed after 1996) the design plans will likely have to be metric. A DTM can easily convert the contouring to metric; streamline contouring would have to be completely redone.

A digital map base will be used to develop the line-and-grade of feasible alternative interchanges. This digital mapping will be layered to provide flexibility of use. The digital mapping will be developed as follows:

1. Planimetric mapping at a scale of 1:600 with spot elevations and breaklines will developed photogrammetrically.

2. The spot elevations and breaklines will be triangulated into a Digital Terrain Model.

3. Any environmental constraints, such as wetlands, cultural resources, etc., will be located and mapped on the Digital Terrain Model, or digitized into the mapping from existing sources.

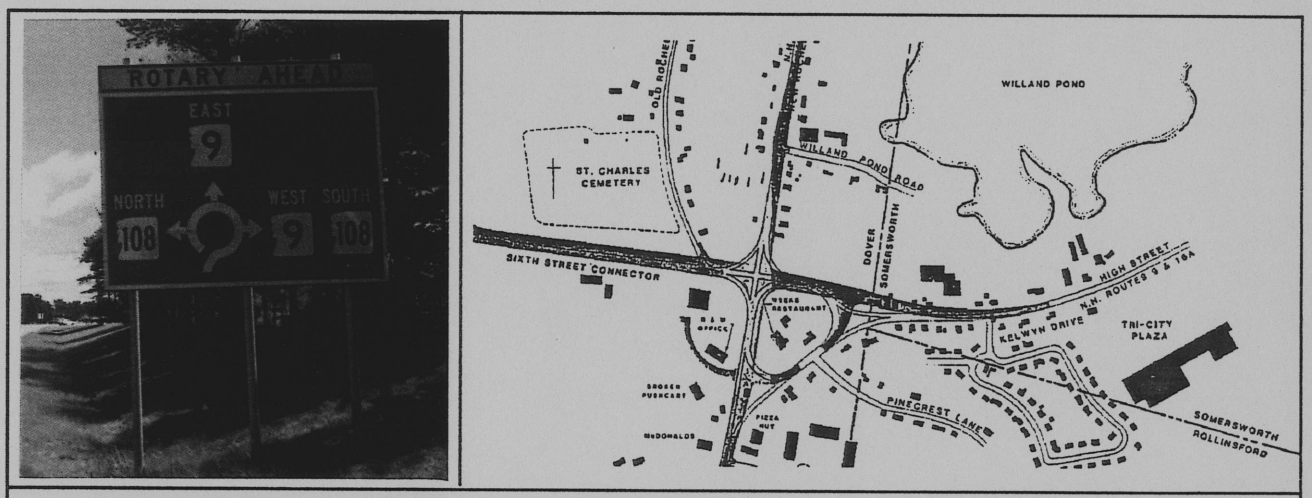
4. Additional constraints, such as topography, existing right-of-way, homes, and utilities will be identified and mapped on the Digital Terrain Model.

5. Using CADD software will develop the preferred line-and-grade of each alternate to minimize earthwork operations, meet established design criteria, and minimize environmental impacts.

Traffic

Evaluation of traffic impacts and traffic relief provided by a new interchange on the Spaulding Turnpike will be a key element in this project. The T-Model2 developed and maintained by the Strafford Regional Planning Commission will be used to develop current and future traffic assignments for the primary project alternatives. This model covers 32 communities and 480 zones in southeastern New Hampshire and completely covers the study area for this project. The model is currently being calibrated for year 2011 traffic projections. This calibration is expected to be completed in November 1993.

The evaluation of volume/capacity ratios and levels of service on area roadways with and without Exit 10 alternatives will be developed. These analyses must consider changes to the existing roadway system; not only those currently under construction (such as the Week's Circle shown below), but also those planned for construction.



The Weeks Traffic Circle at Exit 9 will be reconstructed by 1996. The improved capacity of this intersection will be considered with this study.

Commercial/Industrial Developments

The potential to develop vacant properties for commercial and industrial uses will be an important benefit that a new Exit 10 interchange will provide. The Tri-Cities of Somersworth, Rochester and Dover are all actively pursuing commercial/industrial development. Rochester is also hoping to see the Skyhaven Airport area develop as an industrial growth area.

The construction of an interchange by itself will only open up a small segment of land for development. The widening of an existing roadway, or the construction of a new roadway, to access the new interchange will be a key aspect in promoting economic development. Consensus on the location of the interchange (as concerns the Tri-Cities) may be achieved by constructing a connecting roadway that can service more than one area. In this way, the location of the interchange and its connecting roadway will benefit all Cities in the project area.

↑ *Skyhaven Airport on Route 108 in SE Rochester*

← *Proposed Industrial Park on Route 108 south of Skyhaven Airport*

← *Existing commercial development on High street in Somersworth* →

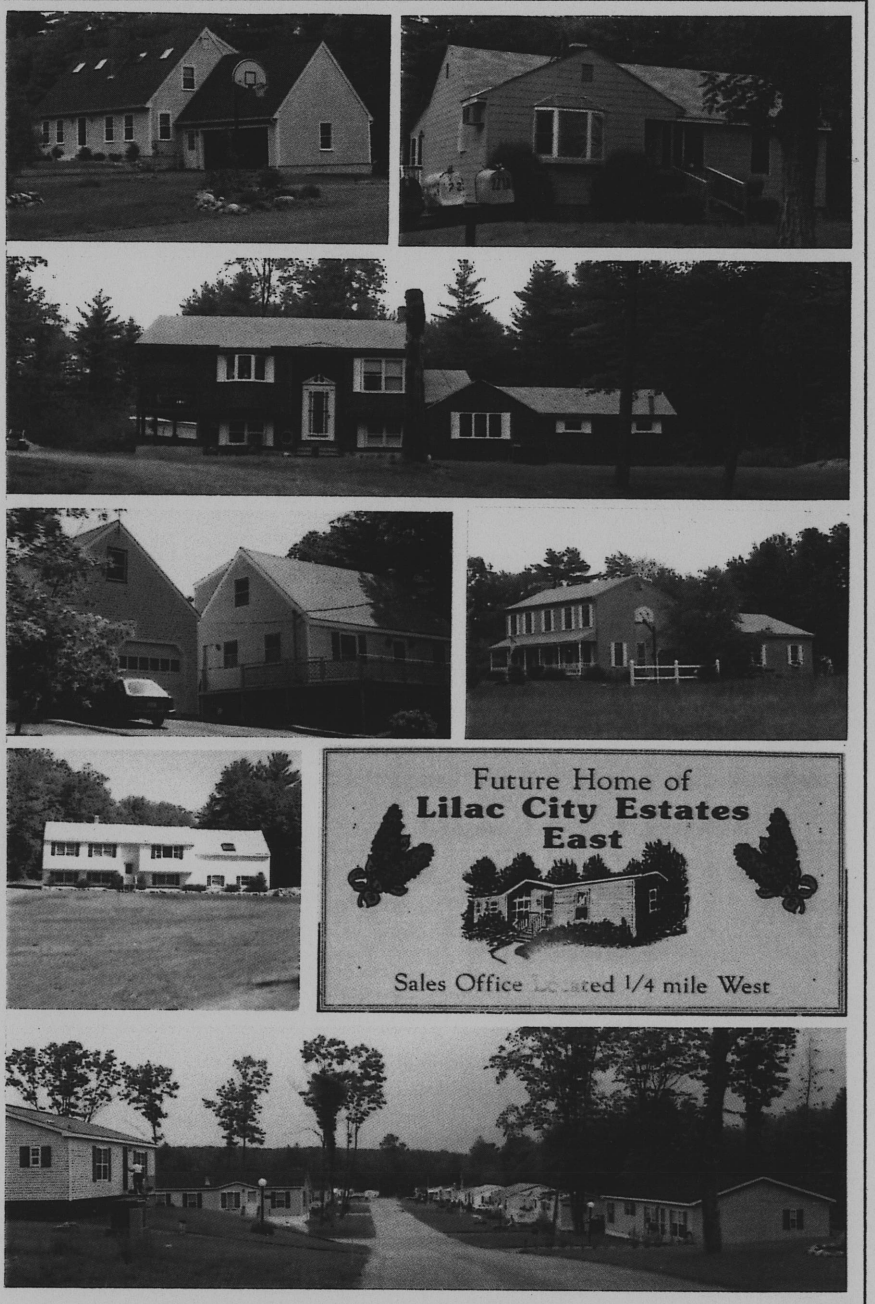
Visual Resources

We will, by field observation and inspection of mapping, identify receptors that are sensitive to changes to aesthetics for each alternative. Particular attention will be given to the visual impact on residential areas, historic sites, and other visually sensitive locations. Using ground photography, we will also characterize the existing visual experience of the people living, working, and traveling in the area of the proposed facility. Emphasis will be placed on views of and from critical areas and sensitive receptors.

Socioeconomic Impacts

A new exit on the Spaulding Turnpike will impact the development of land in the vicinity of the exit and its connecting roadways. Much of the land adjacent to the Turnpike is vacant farmland. Some vacant land is zoned industrial and a new Turnpike access could provide the stimulus for industrial growth. The new exit could be a catalyst for jobs and an increase in tax base. The City of Somersworth will be impacted as a new exit provides additional access to the City with consequent commercial growth anticipated along the connecting roadways. The City of Rochester prefers to have the interchange provide convenient access for industrial growth in the airport area. The City of Dover's northerly industrial area could also be stimulated, depending on the interchange location. Our socioeconomic impact evaluation will be coordinated closely with the Strafford Regional Planning Commission and local land use authorities.

A key portion of the socioeconomic evaluation will be the identification of all residences that will be displaced by each proposed alternative. The project alternatives will all be developed with the goal of keeping residential displacements to a minimum.



Types of housing that can be found in the project area adjacent to the Spaulding Turnpike.

Through the use of the 1990 Census and contacts with local officials familiar with the effected area, we will identify minorities, handicapped, elderly, and ethnic groups which may be affected. The potential for adverse impacts can be established through a review of census profiles. Where displacements are unavoidable, the availability and location of replacement housing will be determined through interviews with persons familiar with real estate in the area.

Besides individual displacements, our study will determine the level of interaction and interdependence that exists among communities in the study area, and the potential effects the proposed improvements will have on community cohesion.

Wetlands

Wetlands can be found throughout the project area. Accordingly, it is expected that wetland impacts will be encountered under any construction alternative developed. Wetland avoidance will be practiced in the development of all project alternatives.

Potential impacts to wetland habitats will be evaluated through the comparative analysis of baseline ecological data (wetlands delineation and functional assessment) and preliminary engineering data. Both direct and indirect impacts will be documented for each alternative. Direct impacts will be considered for any project related activity that will fill, drain, and/or otherwise destroy a wetland habitat. Indirect impacts will be considered as any activity that results in the change of a wetland's hydrology or a reduction in its functional value to wildlife.

Blackwater Brook north of Blackwater Road with extensive wetland

The detailed results of the wetlands investigation will be incorporated into the environmental document. If the preferred alternative results in impacts to wetland habitat, an alternative analysis will be prepared which meets the Environmental Protection Agency Section 404(b)(1) guidelines. Measures to reduce or eliminate direct or indirect impacts to wetlands will be investigated. If impacts are unavoidable, a conceptual mitigation plan will be prepared which will be designed to mitigate wetlands at a minimum 1:1 replacement and functional ratio.

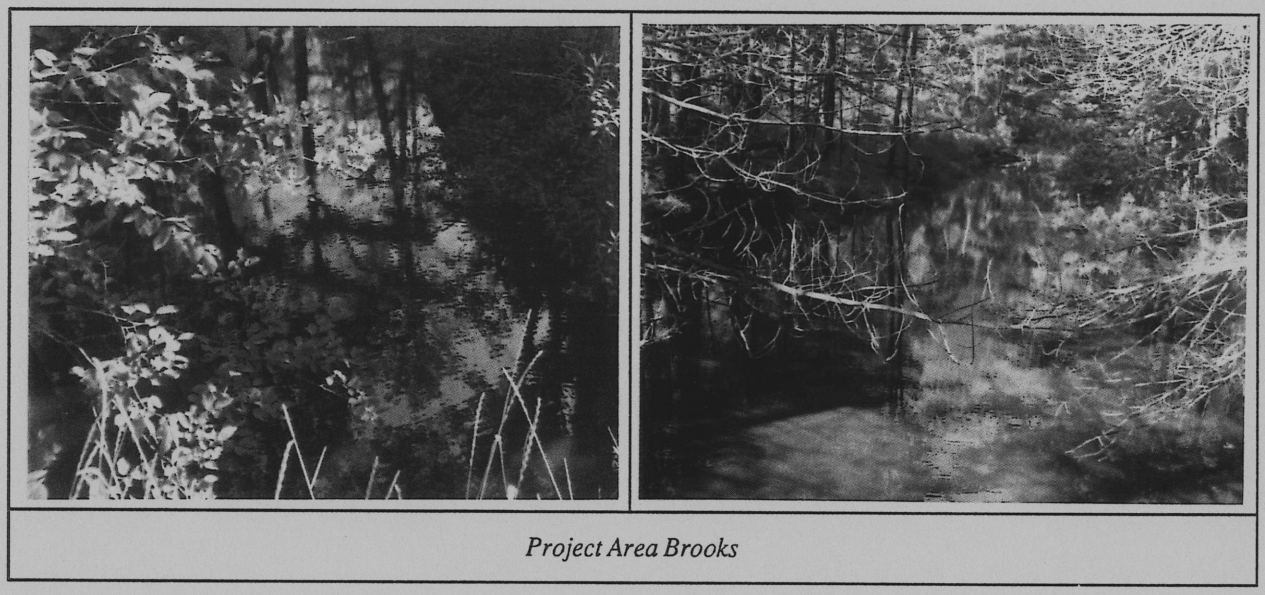
Agency coordination is an important issue that must be thoroughly addressed throughout the wetlands investigation tasks. Coordination with the U.S. Fish and Wildlife Service, EPA, Corps of Engineers, New Hampshire Department of Environmental Services, New Hampshire Fish and Game Department, and other interested natural resource agencies will be conducted. This coordination will include the following items:

- Advising the agencies of the alternatives included in the study
- Organizing and conducting regulatory field views
- The incorporation of the concerns of the agencies into the design of the wetlands alternatives analysis
- The assembly and distribution of field view minutes which serve as the official comments of the regulatory agencies
- The resolution of conflicts between agencies concerning the wetland boundaries and other aspects of the project

Stream Crossings

Numerous streams and brooks traverse the study area and are likely to be impacted by the construction of Exit 10 and any new connecting roadways. Area waterways include: Blackwater Brook; Clark Brook; Reyner's Brook; Peters Marsh Brook; and the Cocheco River. Impacts on the fisheries resource of these waterways will need to be considered.

Mitigation measures to reduce impacts on fisheries resources would include restricting construction near streams, ponds and wetlands during spring runoff (rainbow trout spawning season) and in October (brook and brown trout spawning season). Standard procedures to control construction in or adjacent to streams, and measures to protect water quality, are included in the NHDOT Standard Specifications for Construction. These would include construction of buffer strips, check dams, silt fences, sediment basins, sediment traps, etc.



Project Area Brooks

In order to mitigate the effects of placing culverts in brooks, the EIS will recommend: keeping the disturbed length to a minimum by crossing at right angles to the bank wherever possible; placing culverts below streambed level to allow a natural streambed; and using baffles in culvert bottoms, if necessary, to facilitate fish progress through the culvert. Rechannelization will be kept to a minimum to prevent habitat loss.

Where stream relocation is necessary, the new channel will be meandered in order to retain the existing channel gradient, and the channel bottom will be constructed to reproduce existing conditions as closely as possible. Channel slopes should be grassed, and plantings will be recommended on stream banks to provide shade and habitat. In addition, rocks and boulders will be placed randomly in the stream to create a pool and riffle effect.

Roadway drainage should be designed to avoid direct runoff from pavement (including that of bridges) into permanent streams in order to dissipate heat which could have a significant effect on cold water fisheries and to remove runoff pollutants. All stream crossings must keep increases in the estimated base flood elevation under one foot.

Historical Resources

As shown on the project study map in the beginning of this section of the proposal, potential historic structures are located within the project area. Reconnaissance of the project area and research of available records early in the project development will identify potential structures that should be avoided in the development of the project alternatives.

Historical structures found in the study area immediately adjacent to Spaulding Turnpike.

Background research on historic structures will focus on documenting local history, as well as the histories of specific historic buildings. County and township histories will be consulted, as well as historic maps and atlases. Primary documents, including deeds and tax records, will be examined as needed to establish site histories and significance. Informant interviews will be conducted. The National Register of Historic Places, and any local historic surveys will be consulted.

For significant aboveground resources subject to project impacts, determination of eligibility studies will be performed. This will involve more intensive documents research, as well as more detailed examinations of the structures. Based on this additional information, the historic significance of resources will be assessed in detail. Appropriate documentation, including resource location maps and photographs will be prepared. Each resource will be evaluated as to whether it meets the criteria for inclusion on the National Register of Historic Places. A combined Historic Structures Inventory and Determination of Eligibility Report will be prepared.

Archaeological Resources

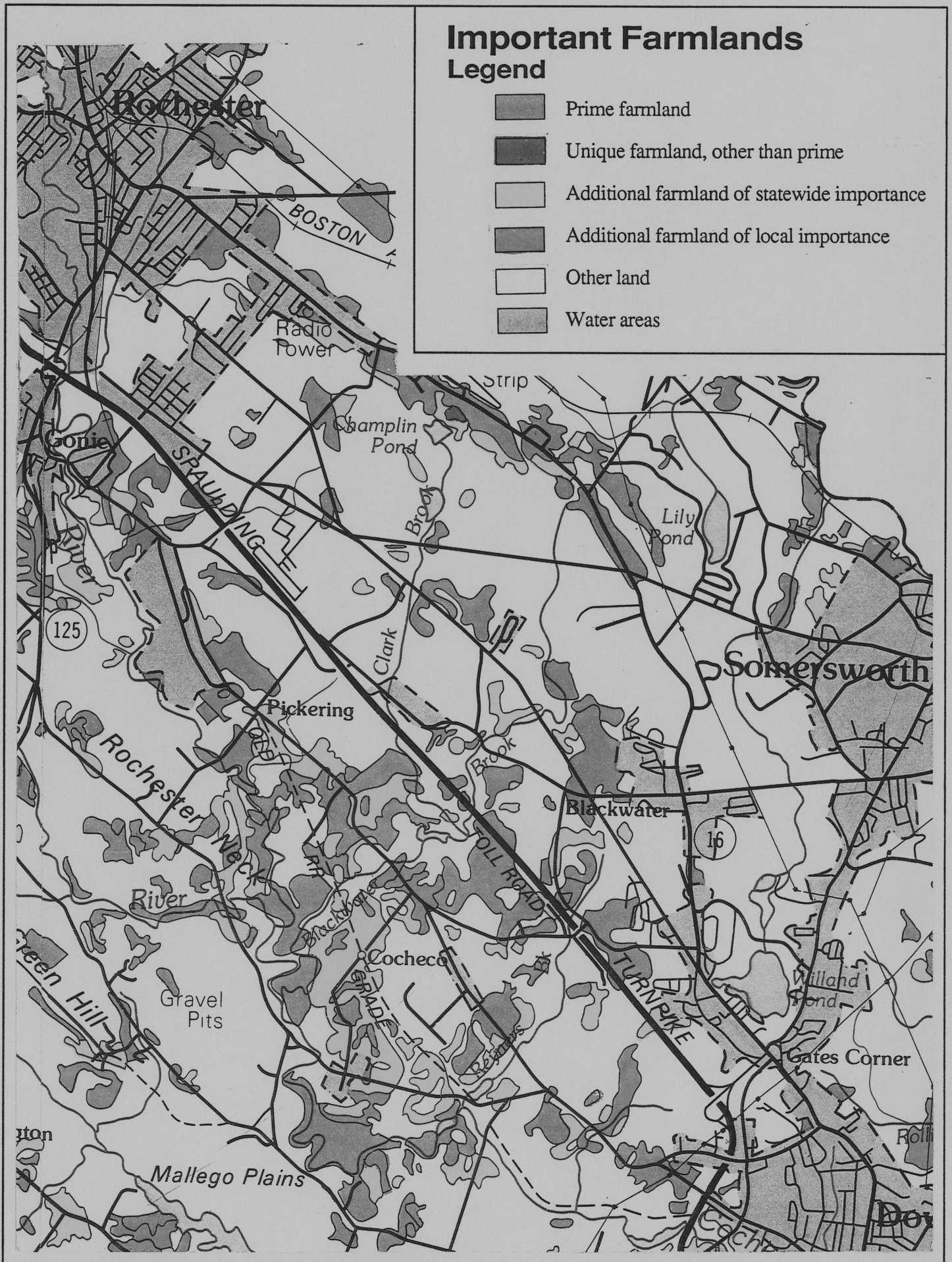
The study area includes the landscape bordering the Cocheco River and its tributary streams. This landscape is likely to exhibit archaeological sensitivity for both historic and prehistoric sites. We can expect to discover archaeological resources along the river and stream terraces including prehistoric sites ranging from small, temporary camps to larger, semi-permanent settlements and including historic agricultural, domestic or industrial sites such as homesteads, farms, or mills.

Archaeological resources will be identified through several phases of study coordinating with phases of design and review. Initially, data will be collected for the entire, broad study area to identify previously recorded sites and locations exhibiting site sensitivity. This will be presented in a report and on a constraints map and will be useful for guiding preliminary design. Subsequent study will be guided by the location of interchanges or roadway improvements. In areas where construction coincides with zones of archeological sensitivity, continued study will be implemented. This study will involve detailed visual inspection to refine constraints followed by subsurface sampling to positively define site locations. Study will then include intensive site examination to develop statements of significance pursuant to determining eligibility to the National Register of Historic Places.

Farmland Impacts

As shown on the following page, the project corridor has active farmland located throughout the study area. The apparent size of the average farm (from visual observation) suggests that acquisition of any farmland required by the project will not make continued farm operation economically unfeasible. Where the preferred alternative traverses active farmland, overland drainage will not be recommended due to the affect of deicing agents on crop productivity. In areas adjacent to cropland, grassed swales can be used at the toe-of-slope to intercept road runoff and convey it away from the croplands.

Actively farmed land located thoughout the project corridor.


Important Farmlands
Legend
Prime farmland
Unique farmland, other than prime
Additional farmland of statewide importance
Additional farmland of local importance
Other land
Water areas
Rochester
BOSTON
Radio Tower
Strip
Champlin Pond
Gonic
SPAULDING
Brook
Lily Pond
River
125
Clark
Somersworth
Pickering
Rochester Neck
Brook
Blackwater
16
TOLL ROAD
River
Blackwater
Cocheco
GRADE
TURNPIKE
Willand Pond
Gravel Pits
Green Hill
Gates Corner
Mallego Plains

Hazardous Wastes

A Hazardous Waste Assessment and Inventory of the properties affected by the new right-of-way will be performed. The investigation will include all residential, municipal and industrial facilities, and potential hazardous waste disposal sites located within the project corridor.

The potential to encounter significant hazardous waste sites within the project area is not considered likely. However, there are existing landfills in the study area that appear to have little control and may contain hazardous waste. In particular, 55-gallon drums were observed at the base of the Old Rochester Landfill. The fact that this landfill apparently drains unchecked into a tributary of Clark Brook is also of concern. Sampling of project area surface water is recommended to determine if a problem exists with runoff from landfills.

Section 4
Scope of Work

The Scope of Work included in this section of our proposal describes the engineering services which will be provided by Clough, Harbour & Associates and our subconsultants.

The scope of the design services includes all items presented in the Scope of Work transmitted under cover of letter dated August 5, 1993; the Project Briefing meeting held on August 12, 1993; and subsequent written clarification on specific items of the Scope of Work. Additionally, we have utilized our experience on similar projects, our field review of the site, and our preliminary investigations, to enhance the Scope of Services.

Our Scope of Services is broken down into major task and subtasks to provide a logical progression of the work.

TASK I - DATA COLLECTION/PROJECT FAMILIARIZATION

A. Survey and Mapping

1. CHA will obtain new aerial photography using a high resolution, low distortion, precision aerial mapping camera for the area in the Cities of Dover, Rochester, and Somersworth as depicted in the plan contained in the proposal solicitation. The aerial photography will be at a negative scale sufficient to produce 1"=50' scale mapping with 1' contour intervals, and at a negative scale of 1"=1000'.

2. The Department will establish second order ground control along the Spaulding Turnpike and third order vertical control points along area highways.

3. CHA will install targeting in advance of the aerial photography, and designate horizontal and vertical control points necessary to orient the aerial photography.

4. The Department will provide the necessary survey to locate the photo control points.

5. CHA shall provide the following mapping derived from the field survey data and photogrammetric methods which conforms to NHDOT standard practices. The plans shall be digitized in GDS MOSS format using NHDOT codes and on 24"x36" mylar.

   1" = 50' scale topographic base mapping with 1 foot contour intervals.

   1" = 200' scale topographic base mapping with 5 foot contour intervals.

6. CHA will provide the Department with two sets of 9"x9" contact prints of the aerial photography, and one set of 1"=200' photographs on cronoflex mylar or equivalent screened medium, of all 1000'-scale aerial vertical photography negatives, according to NHDOT standard practices.

7. The Department shall perform the field survey and field edit necessary to obtain data which is not obtainable from aerial photography and add the data to the digital mapping files.

8. The Department shall obtain supplemental survey at critical locations for design purposes.

9. The Department shall provide the additional survey and mapping necessary to keep the mapping current for the duration of this Agreement.

B. Project Orientation

1. The Department shall provide or make available any previous studies and inventories related to the project. CHA will review the Department's files and interview Department personnel for pertinent information. Prior to initiating work, CHA will become familiar with the project and related materials.

2. CHA will visit the project site for the purpose of becoming familiar with actual field conditions and site characteristics.

3. CHA will attend a "Get-Start" meeting at a site to be determined to introduce CHA's project team to the Department's project staff, Strafford Regional Planning Commission staff (SRPC), and, if necessary, local officials. The purpose of this meeting will be to develop working relationships to assist in the progression of future project tasks.

C. Traffic Counts

1. Upon review of previous studies and information on file with SRPC, CHA will develop a Data Collection Plan which will describe the proposed traffic count program, analyses and forecasting procedures. This plan will be submitted to the Department and SRPC for review and comment.

2. Upon approval of the Data Collection Plan, CHA will conduct the required traffic count program for the project.

D. Environmental Inventory

CHA and its subconsultants will gather data to inventory significant resources within each project area. This will include, but not necessarily be limited to, public lands, hazardous waste and asbestos, agricultural lands, fish and wildlife, area ecology, wetlands, historical and archaeological resources, and air and water quality.

1. Historic and Archaeological Resources

   CHA will contact the State Historic Preservation Office to review the project area for resources of historical or archaeological sensitivity and significance. If significant resources are identified, CHA's subconsultant will perform a Site Identification Study and subsurface sampling program in order to accurately locate these resources and to gain a preliminary indication of site content, integrity, etc.

2. Land Impact

   CHA will inventory land use and agricultural resources based upon review of existing documentation and consultation with local, municipal, and regional planning and technical agencies. Particular areas of investigation will include planned and unplanned development, residential, commercial, public/institutional, agricultural, open space/undeveloped lands, and park land [4(f)] properties.

3. Water Quality/Flood Plains

   CHA will identify and classify water resources and flood plain boundaries which might be impacted by each project. This evaluation will include identification of aquatic life inhabiting the water.

4. Hazardous Waste

   CHA will perform a hazardous waste assessment investigation composed of the following:

   - A site inspection (field walkover inspection) of each project site or corridor with an emphasis on determining the presence of:

     - noxious odors emanating from the soil or water
     - discolored soil, water, or foundations
     - leaking pipes, transformers, tanks, and barrels
     - dead vegetation or lack of vegetation

   - Past land use research will include, but not be limited to, an investigation of or contact with the following:

     - local assessor's records
     - building permit records

- title abstracts
- long-time area occupants
- local atlases
- Department staff

o A review of available underground tank permit reports to include the location of the project alternatives relative to any nearby underground storage tanks.

o A review of available waste incident reports will include an inspection of any inactive hazardous waste disposal sites and will include consultation with local health and fire departments regarding such sites.

5. Asbestos

CHA will perform an asbestos material assessment investigation for each project corridor. This investigation shall be composed of the following investigation technique:

o Site inspection (field walkover inspection) of each project site or corridor to determine the location of suspect material which may potentially affect the design or construction of the proposed project. This site inspection shall include a walk-through visual survey of all buildings which may potentially be acquired and/or demolished for project purposes. The field inspection and building survey will be conducted to determine locations and approximate quantities of suspected asbestos material. Common indications and warnings may include "Transite" pipe, heating system insulation, and structural fire-proofing/retardation coatings, etc.

CHA will document and summarize the findings and evaluations of the asbestos investigation techniques employed and, if appropriate, provide recommendations for design and construction activities which may serve to mitigate or reduce potential project involvement with asbestos.

6. Ecologic and Biological Resources

CHA will conduct a literature review by researching the files of all relevant local, regional, state, and federal natural resource agencies for rare, threatened, and endangered state and federal plant and animal species.

7. Wetlands

Wetland areas will be inventoried by CHA using the 1989 Corps of Engineers (COE) methodology which is the definition used by the Wetland Board of the Department of Environmental Services (DES). Wetlands will be identified, delineated with flagging, field located, and incorporated into the project mapping.

CHA will prepare a "constraints map" depicting all identified constraints for use in development of alternatives.

TASK 2 - NEEDS ASSESSMENT/PROJECT SCOPING

A. Agency Coordination/Scoping

CHA will assist the Department in preparing a Notice of Intent for publication in the Federal Register. A scoping meeting(s) will be held with appropriate local, regional, state, and federal agencies, other interested groups (e.g. Audubon Society) and the public to initiate the coordination process, supplement the collection of data, confirm the study area, identify the issues of concern and define the reasonable range of alternatives. CHA will be responsible for preparing letters of invitation to the scoping session(s), developing appropriate graphics for use at the session(s), making technical presentations and handling other tasks necessary to the conduct of the session(s).

Written correspondence, telephone communication and personal visits, as necessary, will be employed to continue the coordination effort and collect information.,

Subsequent to the scoping meeting(s), and prior to identifying conceptual corridors, a statement of the project purpose and need will be prepared by CHA and presented to the Corps of Engineers for their acceptance, in accordance with the Corps' Highway Methodology.

B. Traffic Projections

CHA shall project and compute the AADT, DHV, and DDHV traffic volumes (including vehicle mix) for all interchanges, intersections, ramps and mainlines within the project limits, using available traffic counts, count information gathered as part of this study, and traffic model information provided by SRPC. These volumes shall be computed for existing conditions and:

Estimated Time of Completion (ETC)
ETC + 5 yrs.
ETC + 10 yrs.
ETC + 15 yrs.
ETC + 20 yrs.
ETC + 30 yrs.

Traffic forecasts shall provide sufficient data for all design and environmental aspects of the project. Traffic flow diagrams shall be prepared showing existing and forecasted traffic movements on each approach.

The details of the traffic gathering, analysis, and forecasts to be used will be agreed upon between CHA, the Systems Analysis Section of the Department, Bureau of Transportation Planning and SRPC.

C. Data Analysis/Needs Assessment

CHA will conduct a thorough analysis of all the data collected representing existing conditions. An analysis of ETC and ETC + 20 years traffic forecasts will also be conducted to evaluate the ability of the existing street network to accommodate the forecasted traffic flows. From the results of the analysis, an assessment of the roadway needs will be determined.

The Data Analysis and Needs Assessment will be summarized in a technical memorandum that will be provided to the Department and local officials. We assume the following information will be presented in the technical memorandum:

- A summary of all traffic data collected for this study.
- A discussion of the development of the design hour volumes.
- A description of the methodology used to develop the traffic forecasts, including a listing of all significant traffic generators planned and their impact on traffic flows.
- Traffic flow maps to illustrate the base year turning movement volumes and the ETC and ETC + 20 years design hour volume traffic forecasts.
- Calculation of level of service for all study area roadways and links for the ETC and ETC + 20 year design hour volumes.
- Location of existing major traffic generators.
- A summary of the accident history for all study area roadways. Accident rates will be calculated for all study area intersections and links and collision diagrams will be prepared for all locations.
- A traffic signal warrant analysis will be conducted for all intersections within the study area, including the intersections that are currently controlled by a traffic signal.
- A summary of the physical conditions of roadways in the study area, including curbs, sidewalks, drainage features, pavement, etc.
- An inventory of all traffic signals in the study area, including age, condition, controller type, phasing and timing and coordination capabilities.

All other data collected during Task 1 will also be included in the technical memorandum as appropriate. The technical memorandum will also present an assessment of the roadway needs to adequately accommodate the projected conditions.

D. Alternative Development/Alternative Assessment

Based on the results of the data analysis and needs assessment summarized in the technical memorandum, CHA will develop reasonable alternative schemes to meet projects objectives. Each alternative will be analyzed for its ability to provide adequate levels of service and to conform to the design criteria and standards. Careful consideration will be given to:

- Avoidance of identified constraints including environmentally sensitive areas and/or mitigation.
- Meeting all design criteria and standards. However, alternatives may be developed with design exceptions in order to mitigate impacts.
- Department and local officials suggestions for improvements.
- Ability of the solution to meet the project's objective(s)

Each alternative scheme will be subject to refinement and testing in terms of preliminary functional design-cost, environmental considerations and traffic. Previous investigations and evaluations related to functional planning and engineering aspects will be refined, and more detailed preliminary engineering analyses will be conducted to prepare working line and grade profiles, the location and types of major structures (if any), right-of-way layout including easements, identification of various sensitive environmental concerns, and preparation of preliminary cost estimates.

Significant alignment criteria (degree of curve, grades, etc.) would be detailed on the plan and profile to a degree necessary to show the roadway's alignment, earthwork limits, right-of-way needs, all bridges and major culverts, and intersections. Preliminary cost estimates shall be developed using construction items and be based on preliminary unit quantities for all significant engineering items including major drainage facilities, pavement, structures, earthwork, right-of-way, environmental mitigation and other miscellaneous and incidental construction items as necessary. Right-of-way estimates shall be developed and the Department will assist CHA in establishing base costs for right-of-way estimates.

Environmental impacts shall be evaluated with respect to each improvement. Each resource identified shall be examined closely and detailed carefully. Mitigation measures will be suggested to reduce or minimize short and long-term impacts.

E. Scoping Report

Upon completion of Task 2D, CHA will prepare an Initial Scoping Report (ISR) documenting the results of the engineering investigations and an evaluation of the alternatives. The ISR will include a project purpose and need statement and discuss the observations and inputs from all parties contacted. The information presented in the technical memorandum will be summarized, including the resolution of any comments. The ISR will present the alternatives developed in Task 2D and provide a discussion of the relative merits of each along with specific recommendations. Preliminary construction cost estimates and potential environmental impacts will be included in the Alternative Discussion.

Following review and comment on the ISR, a meeting will be scheduled to receive review comments. CHA will revise the ISR to incorporate these comments, as well as update the project schedule and construction cost estimates. The updated report will be known as the Final Scoping Report (FSR). Following its distribution, CHA will present the FSR's findings to interested parties and answer any questions relative to the report. CHA will revise FSR to incorporate any comments from interested parties.

TASK 3 - PRELIMINARY DESIGN

Preliminary design studies will take the basic concept developed in the Needs Assessment/Project Scoping task and develop it to a level to accurately ascertain conformance to design criteria and to accurately detail environmental impacts.

A. Preliminary Alignment Concepts/Screening

1. CHA shall identify and make preliminary evaluations of potential design alternatives that will meet project objectives including alternatives identified in the ISR. The Null Alternative must also be evaluated. Structural design shall be limited to only the work necessary to establish basic structural concepts, obtain clearances, accommodate stream flow, and estimate costs.

2. For each preliminary design alternative and the Null Alternative, CHA shall provide the Department with a written assessment describing relative order-of-magnitude costs, advantages, disadvantages, and problem areas.

3. For each preliminary design alternative this written assessment shall be accompanied by working drawings at 1"=50' scale. In addition to existing features and topography, the drawings at this stage shall include:

    - o plans showing proposed centerlines, pavement edges, degree of curve/radius information, and work limits.
    - o profiles showing theoretical grade lines, critical clearances, vertical curve data, grades, and touchdown points.
    - o typical sections showing lane, median, and shoulder widths, ditches, gutters, curbs, and side slopes.

o identification of design constraints.

Working drawings shall be detailed enough to develop preliminary cost estimates, evaluate environmental impacts, evaluate maintenance and protection of traffic impacts during construction, identify any non-standard features which would be retained, and evaluate right-of-way impacts.

4. CHA shall modify the written assessments and drawings as necessary following review by the Department. From these preliminary assessments, as modified, the Department shall select design alternatives for further development and advise CHA to proceed.

B. Design Alternative Development

1. CHA shall develop 1"=50' scale plans for each of the selected alternatives. At critical locations and bridge sites where more detailed study required, CHA shall provide drawings at 1"=20' scale. As a minimum all plans shall show stationed centerlines, roadway geometrics, major drainage features, wetland boundaries, construction limits, cut and fill limits, and proposed right-of-way taking lines.

2. CHA shall develop profiles for each design alternative at a scale of 1"=50' horizontal and 1"=10' vertical. As a minimum the profiles shall reference USGS datum and show all significant elevations, existing ground lines, theoretical grade lines, all vertical geometric data including sight distances, critical clearances at structures, centerline stations and equalities, construction limits, and superelevation data.

3. CHA shall further evaluate and compare each design alternative and the Null Alternative with specific engineering analyses and considerations. The depth of analysis shall be as required to determine the relative suitability of each design alternative. Structural design shall be limited to only the work necessary to establish basic structural concepts, obtain clearances, accommodate stream flow, and estimate costs. These analyses shall include (where appropriate) but not be limited to the following:

Traffic Flow and Safety Considerations
Soil and Foundation Considerations
Pavement Considerations
Right-of-Way Impacts
Schematic typical sections
Alignment constraints & design geometry
Justification for retaining non-standard design features
Signs and signals
Structural design (bridges, retaining walls, major culverts)
Utilities
Drainage
Maintenance and protection of traffic during construction
Accessibility for pedestrians, bicyclists and the handicapped

Level of service analysis (intersections, mainline, interchanges)
Construction cost factors (including mitigating wetland, noise, and other environmental impacts)
Environmental factors (Task 4)
In depth accident analysis of existing conditions and the expected improvements for each alternative
Maintenance responsibility

4. The Department shall provide real estate information, including relocation data. CHA shall obtain any additional information needed to discuss the effect of each design alternative on the displacement of residences and businesses.

5. CHA shall examine the impacts of the design alternatives and the Null Alternative on:

Regional and community growth
Conservation and preservation (soil erosion, sedimentation, wildlife, area ecology, parks and recreational facilities, historic and natural landmarks, agricultural land, energy, wild and scenic recreational rivers)
Public facilities and services (religious, health, and educational facilities, public transportation, water resources, emergency services, telephone, gas and electric service, public utilities)
Community cohesion
Air, noise, water pollution, wetlands (state and federal)
Flood plains
Aesthetics
Hazardous Waste

It is assumed that no detailed, quantitative studies will be required other than those specified under Task 4 Environmental Studies.

C. Draft Environmental Impact Statement Preparation

1. CHA shall document the results of these studies in a "PRE-DRAFT ENVIRONMENTAL IMPACT STATEMENT". It shall be in a format approved by the Department, in accordance with FHWA Technical Advisory T6640.8, and CHA shall submit this report to the Department for an informal review.

2. CHA shall revise the report to incorporate the initial review comments and resubmit it as a "DRAFT ENVIRONMENTAL IMPACT STATEMENT" (DEIS) for formal Department and associated agency review.

3. CHA shall revise the report to incorporate the formal Department and associated agency comments and resubmit it as a "DRAFT ENVIRONMENTAL IMPACT STATEMENT" (DEIS) for required signatures.

D. Advisory Agency Review

1. The Department will distribute the DEIS to the advisory agencies.

2. CHA shall assist the Department in evaluating and preparing individual responses to the review comments received, or by meeting with advisory agencies as required.

TASK 4 - ENVIRONMENTAL STUDIES

A. General

CHA shall provide assistance to the Department in meeting the requirements of the following laws, regulations and other guidance as they apply to the project:

Federal

Water Quality Certification	33 USC 1341 (Section 401 of the Federal Water Pollution Control Act)
Executive Order 11990, Protection of Wetlands	DOT Order 5660.1A
Dredge and Fill Permit (U.S. Army Corps of Engineers Section 404 permit)	33 USC 1344 33 CFR 320-325 40 CFR 230, 231
Section 10 Permit from the U.S. Army Corps of Engineers	33 USC 403
Fish and Wildlife Coordination Act	16 USC 661
Safe Drinking Water Act (Sole Source Aquifer Program) FHWA/EPA Memorandum of Understanding	PL 93-523, Section 1424(e) 40 CFR 148 Sole Source Aquifer 1424(e)
Relevant Sections of 23 CFR 771	
U.S. Wild, Scenic & Recreation Rivers Act	16 USC 1271
Endangered Species Act	16 USC 1531

The studies and reports prepared under this Section by CHA will support this process and shall contain a description of the affected resource, expected impacts, and potential mitigation commensurate with the sensitivity of the resource and the degree of expected impact for each of the assumed alternatives and the Null Alternative. Each of the assessments, reports and analyses prepared under this section (noise, air quality, water quality, ecologic, energy, visual resource, and hazardous waste) shall be submitted as a Technical Memorandum to support the finding in the DEIS.

B. Noise Study

1. Following a determination that the project is a Type I project as defined in Section 772.5(h) of 23 CFR 772 (the Regulation), CHA shall perform a noise study and document the findings as directed by the Department. CHA shall review, modify and re-study as necessary, and incorporate as appropriate, any noise study completed previously for the project.

2. CHA shall identify existing activities, developed lands, and undeveloped lands for which development is planned, designed, and programmed, which may be affected by noise from the highway project, and determine the applicable Activity Category into which the existing development falls. Activity Categories are described in Table 1 of the Regulation. In addition to the area-wide determination, particularly noise sensitive receptors such schools, churches, hospitals, libraries, auditoriums, parks, and preserved natural areas shall also be identified on a site (rather than area) basis.

3. CHA shall determine the existing noise levels throughout the project study area. Field noise measurement shall be obtained using the procedures provided in FHWA Standards. Traffic volumes, speeds, and classifications will be provided by CHA. CHA shall propose appropriate measurement locations to the Department for approval prior to measurement. CHA shall present the results of these measurements in a manner acceptable to the Department.

4. CHA shall make predictions of future traffic noise levels for each alternative under study including the Null Alternative. These predictions shall be consistent with the FHWA Highway Traffic Noise Prediction Model (Report No. FHWA-RD-77-108) and shall use the STAMINA 2.0 computer program. In predicting noise levels, traffic characteristics which will yield the worst-case hourly traffic noise impact on a regular basis for the design year shall be used. CHA shall present the results of these predictions in a manner acceptable to the Department, either graphically (e.g., noise contours) or numerically in tabular form.

5. CHA shall determine the traffic noise impacts for each alternative. Impacts will occur when the predicted traffic noise levels equal or exceed the Noise Abatement Criteria (Table 1 of the Regulation), or when the predicted traffic noise levels exceed the existing noise levels by six or more decibels. CHA shall document the determination in terms of the activity categories listed in Table 1 of the Regulation by providing the number of residences, businesses, and other properties impacted by each alternative.

6. For the impacted areas, CHA shall examine and evaluate alternative noise abatement measures for reducing or eliminating the noise impact. When noise abatement measures are being considered, every reasonable effort shall be made to obtain a ten decibel noise reduction. The abatement measures listed in Section 772.13(c) of the Regulation must be considered. Only public schools are eligible for noise insulation as an abatement measure.

   The FHWA Noise Barrier Reduction Optimization Procedure (OPTIMA, FHWA-DF-82-001A, April, 1982) shall be used in conjunction with STAMINA 2.0 to determine noise barrier heights and lengths.

   CHA shall analyze the acoustical effectiveness and cost effectiveness (vs. degree of impact) of the abatement measures and recommend specific measures at specific locations which are found to be feasible and reasonable.

7. CHA shall analyze construction noise caused by the project by identifying affected land uses or activities and determining measures needed to minimize or eliminate the adverse impacts on them and on the community.

8. CHA shall prepare informational material to be submitted to local officials having jurisdiction in the project area, for their use in protecting future land development from becoming incompatible with anticipated highway noise levels. It will include the best estimate of future noise levels (for various distances from the highway improvement) for both developed and undeveloped lands in the vicinity of the project.

9. CHA shall document this study in a Noise Study Technical Memorandum which is summarized in the text of the DEIS. CHA shall submit suitable copies of the noise study report to the Department in advance for preliminary review.

10. CHA shall revise the noise study report and its text summary to incorporate the Department review comments prior to public distribution of the noise study results including the informational material.

C. Air Quality Study

1. CHA will ascertain and report the impacts of the various design alternatives, including the Null Alternative, on the air quality of the area containing the project and influenced by it. CHA shall submit for prior Department approval proposed procedures for analyzing air quality impact. These procedures will be consistent with FHWA guidance.

   The State shall define the worst case meteorological conditions affecting air quality projections. CHA shall investigate and advise the Department as to whether additional meteorological conditions must be applied in the analysis. The Department will approve in advance the need for additional data collection or studies.

CHA shall provide (as applicable) the following traffic forecasts for each alternative:

- o Annual Peak Hour or Design Hour Volumes
- o Vehicle Operating Speeds
- o Hot/Cold Start Estimates
- o Vehicle Classifications
- o Directional Splits
- o Turning Volumes

These forecasts will be provided separately for:

- o Estimated Time of Completion (ETC)
- o ETC + 10 yrs.
- o ETC + 20 yrs.

2. CHA shall perform a corridor carbon monoxide (CO) emissions analysis to define the critical microscale analysis year. These emission calculations shall be made for the present, the estimated time of construction completion (ETC), ETC + 10 yrs., and ETC + 20 yrs. Calculations shall be made for each design alternative and the Null Alternative. The critical year is the year which results in the highest emissions. These calculations shall be based on traffic data described above.

   Calculations necessary to obtain emission factors should be made in accordance with the U.S. Environmental Protection Agency publication AP-42, "Compilation of Air Pollutant Emission Factors - Second Edition", Mobile Source Emissions Model (Latest Version).

3. From a review of projected traffic volumes and relative receptor locations, CHA shall select potential study sites. These shall include immediately adjacent sites that would experience direct impact as well as sites near other facilities significantly affected by the project. CHA shall obtain State approval of the proposed study sites before proceeding with the analysis.

4. For each design alternative and the Null Alternative, CHA shall conduct a microscale analysis for CO concentrations for peak hour traffic volume and 8-hour concentrations using an applicable persistence factor(s). This will be a worst-case analysis, and using the specified emission factor tables and computer models (currently MOBILE 4.1 emission factor tables, the CAL3QHC program for intersections, and either the CALINE 3 or CAL3QHC programs for free-flow conditions).

5. For free-flow conditions the analysis will follow a tiered approach, with an initial Level I analysis of each site, followed if necessary by a Level II analysis of each site for which predicted 1 hour or 8 hour CO maximums would be exceeded.

6. CHA shall qualitatively assess the construction impacts of the project on the air quality of the study area.

7. CHA shall prepare an Air Quality Technical Memorandum identifying, through text and graphic presentation, the impacts of each design alternative on air quality. All impacts, whether adverse or beneficial, shall be included.

   The report shall include a comparison to State and Federal Air Quality Standards, and a discussion of the consistency of the project with the State Air Quality Implementation Plan. The report shall include a description of the factors considered in identifying the impacts and the methods used in data collection. CHA shall submit suitable advance copies of the report to the Department for preliminary review.

8. CHA shall revise the Air Quality Technical Memorandum to incorporate the Department review comments prior to its public distribution.

D. Water Quality Study

CHA shall perform the work necessary to analyze the project's impact and prepare reports on surface water quality, ground water quality, and freshwater wetlands in the project area and determine all permits which will be required.

E. Surface Water Quality Study

1. CHA shall identify potable water supply sources which might be impacted by the project. The Water Quality Classification of local streams shall also be identified along with available information concerning types of aquatic life present (as appropriate).

2. CHA shall use a prediction method for chloride concentrations developed by L. Toler to assess the impact from the use of de-icing salts on the water quality of the area if significant impacts are anticipated. The method is a "State of the Art" approach to quantification of impacts on surface and groundwater from de-icing chemicals. Other methods of analysis must be approved by the Department prior to use.

3. CHA shall assess the effects of each design alternative on surface water quality with particular attention to the potential for erosion and sedimentation of exposed soils. The study should follow the methods and protocols concerning stormwater runoff. Construction and operational impacts and mitigative measures for streams and other bodies of water must be discussed. As appropriate the discussion should include possible increases in water temperatures due to removal of stream bank vegetation, the effects of erosion and sedimentation, the effects of runoff from the completed project, and accidental spills of toxic materials before and after project completion.

F. Ground Water Quality Study

1. CHA shall compile, from available literature, data on the groundwater regime of the project area including water table elevations, aquifer recharge areas, and a list of wellhead protection areas. CHA shall assess the effects, if any, of each design alternative on groundwater quality and flow particularly with respect to changes in water table elevations and their possible influence on aquifers (including sole source aquifers) vegetative patterns, as well as the impacts of project runoff (e.g. salt) on groundwater quality.

2. Using the latest FHWA-approved predictive methodology, CHA shall determine the vehicle pollutant characteristics in highway drainage runoff and analyze the effect of this on groundwater quality. This analysis will be performed for all alternatives and shall include a summary of the qualitative impacts on groundwater.

   All water quality studies shall include sufficient information for sole source aquifer review per Section 1424(e) of the 1974 Safe Drinking Water Act.

G. Freshwater Wetlands

1. CHA shall petition the COE or other public agencies to delineate and provide the boundary of any regulated freshwater wetland or regulated water in the vicinity of the proposed facility. CHA will field delineate the Federal Jurisdictional freshwater wetlands in accordance with the 1987 COE Delineation Manual and procedures report.

   All wetland studies done for freshwater wetland permit application purposes should be designed to demonstrate that the proposed action includes all practicable measures to minimize harm to the wetland.

2. CHA shall perform the work necessary to determine the impact of the project on any freshwater wetlands that may be affected by the project. The study shall contain as appropriate, consideration of the following:

   Public health and welfare.
   Fish and wildlife resources.
   Rare and/or endangered species.
   Cover types present and their distribution.
   Wetland type as classified under the DES system and U.S. Fish and Wildlife Report FWS/OBS-79/31, December 1979, & USCOE 1987
   The hydrologic regime of the area as it serves to maintain the wetland.
   Potential mitigation measures.
   Protection and enhancement of the following wetland functions and benefits:
   - Flood and storm control by the hydrologic absorption and capacity of wetlands.

- Wildlife habitat by providing breeding, nesting and feeding grounds and cover for many forms of wildlife, wildfowl and shorebirds, including migratory wildfowl and rare or endangered species.
- Protection of surface and subsurface water resources.
- Recreational by providing areas for hunting, fishing, boating, hiking, bird watching, photography, camping and other uses.
- Pollution treatment by serving as biological and chemical oxidation basins.
- Turbidity control by serving as sedimentation areas and filtering basins, absorbing silt and organic matter and protecting channels and harbors.
- Education and scientific research by providing readily accessible outdoor bio-physical laboratories, and living classrooms.
- Open space and aesthetic appreciation by providing open areas along crowded river and lake fronts.
- Sources of nutrients in aquatic food cycles and nursery grounds and sanctuaries for fish and wildlife.

3. CHA shall prepare and provide 10 copies of a wetland and/or water quality report and/or sole source aquifer report incorporating all material relevant to the application for freshwater wetland permit, COE 404 Wetland-Dredge and Fill Permits, and Water Quality Certification and other water quality matters. Water quality reports and studies shall also include information necessary for sole source aquifer review as appropriate.

   CHA shall prepare the water quality reports and supporting materials for COE 404 Wetland-Dredge and Fill Permits, and other water quality matters. The Department shall submit these reports and/or applications to the appropriate federal or state agencies for approval.

H. Ecologic Studies

CHA shall perform the work necessary to determine the project's potential impact on rare and endangered species. CHA shall also assess impacts on vegetation and wildlife including a general description of the amount and type of vegetation to be disturbed, special habitats which might be damaged, and possible interruption of fish and wildlife movements by the project right-of-way (e.g. blockage of fish movement through culverts, or interruption of deer movement by fences). Mitigative measures will be suggested as appropriate.

I. Energy Analysis

CHA will ascertain and report the energy impacts of the various design alternatives, including the Null Alternative. This analysis shall include an assessment of the direct and indirect energy associated with each alternative. CHA shall submit for Department approval the procedures they propose to use.

J. Visual Impact Assessment (VIA)

1. CHA shall prepare a Visual Impact Assessment (VIA) of significant visual issues. The VIA shall be prepared by, or under the direct guidance of, a landscape architect experienced in VIA preparation. CHA shall provide suitable evidence of this experience.

   General methodology and tasks are outlined below. CHA shall obtain Department approval of project-specific methodology and tasks prior to beginning the work.

2. CHA shall review relevant project information and visit the project site to obtain supplemental information (e.g., photographs and observational notes) necessary for defining the visual environment.

3. CHA shall determine the visual environmental factors as follows:

   a) Appropriate viewshed mapping for each design alternative, including the Null Alternative (for existing conditions) to define the physical limits of the affected visual environment.

   b) Identification of each viewer group within the project area, and determination of view exposure and view sensitivity of each group.

   c) Identification of key views and the range of significant visual resources for each viewer group. Key views should include the views of the project and from the project that best represent the visual environmental for each alternative, including the Null Alternative.

4. CHA shall prepare accurate 8-1/2" x 11" photosimulations to depict and compare existing conditions to the project alternatives as seen from key viewpoints at the project design year (ETC + 20 yrs.). The graphics could be either black-and-white or color, and either originals or copies with the quality of originals.

5. CHA shall assess the visual impacts of all alternatives, including changes to significant visual resources and probable viewer response to those changes.

6. CHA shall recommend measures to avoid, minimize, or mitigate negative visual impacts and to enhance positive impacts. Descriptions and costs of these measures shall be in sufficient detail for incorporation into the preliminary design and for use in evaluating relative advantages and disadvantages among the alternatives.

7. CHA shall document this study in a VIA, to be presented and summarized in the text of the DEIS. CHA shall submit suitable copies of this report to the Department in advance for preliminary review. CHA shall revise the report in accordance with the review comments received.

K. Hazardous Waste Assessment

1. CHA shall investigate for hazardous waste within the project site and corridor. This investigation shall be composed of the following four screening techniques:

   a) Site inspection - a field inspection of the project site and corridor to determine locations of suspected contamination which could potentially affect the design or construction of the project. The presence, location, and description of suspected features within each of the following categories should be noted:

      - Structures and pipelines: underground tanks, surface tanks, lagoons and impoundments, sumps, electrical drums or transformers, ponds and basins, landfills and dump sites, pipelines and pipes, dumpsters and bulk waste, berms and dikes, air stacks, posted signs, sewers and manholes, railroad tracks, drainage ditches, floor drains

      - Visual evidence of contamination: soil discoloration, mottling, or staining, evidence of previous fires, spills or leaks, leachate, stressed or dead vegetation, air emissions and odors, oil sheens on water, seepage or discolored springs discharging from ground surface (hillsides, embankments, etc.) in lower elevation areas near the site.

      - Hazardous materials: sprayed-on fireproofing or pipe wrap, friable tile and acoustical plaster, storage of pesticides

   b) Past and current land use research - A search for and review of available records to determine past and current land use and activities. Some specific land uses and activities of potential concern would be gasoline stations, chemical plants, foundries, junk/scrap yards, and municipal, commercial and industrial landfills. Some sources of such information are:

      - Local Assessor's records
      - Building permit records
      - Title abstracts
      - Long time area residents
      - Local atlases (public library)
      - U.S. Geological Survey
      - Historical societies
      - Shipping and receiving documents
      - Invoice records
      - Detailed plant and site layout drawings
      - Former employees
      - Local Departments of Health and Labor
      - Miscellaneous toxics files

c) Review of Underground Tank Permit Records - Identification, location, and evaluation of existing and former underground storage tanks determined from review of Underground Tank Permit Records and past/current type, and required leak test results.

d) Review of Waste Incident Reports - Identification, location, and evaluation of known or suspected areas of concern listed in the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites and the federal Environmental Protection Agency (EPA) Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS). Review and consultation with Local Departments of Health and Labor, as well as Local Police and Fire Departments for additional information about known or suspected areas of potential concern.

2. CHA shall document this investigation in a Hazardous Waste Technical Memorandum and submit suitable copies to the Department for review. This report will explain the various inspection techniques employed and summarize the findings. Where appropriate, it shall provide recommendations for design measures and construction activities which would serve to minimize potential project involvement with hazardous waste.

3. CHA shall revise and resubmit the report, incorporating the Department review comments.

L. Asbestos Assessment

1. CHA shall perform an Asbestos Material Assessment investigation for the project site and corridor. This investigation shall be composed of the following two investigation techniques:

   a) Site inspection - a field walkover inspection of the project site or corridor to determine the location of suspected material which may potentially affect the design or construction of the proposed project. This Site inspection shall include a walk-through visual survey of all buildings and bridges which may potentially be acquired and/or demolished (including those previously acquired for project purposes). The field inspection and building/bridge survey will be conducted to determine locations and approximate quantities of suspected asbestos material. Common indications and warnings include:

      - Transite pipe
      - Heating systems insulation
      - Structural fire proofing/retardation coatings, etc.
      - Bridge backwalls

b) Materials sampling and testing - Based on the findings of the site inspection, CHA will prepare, if necessary, an Asbestos Sample Location Plan for review and approval by the Department and other affected agencies. Pending comments and receipt of approval to proceed, CHA shall obtain an approved subcontractor to sample and test the suspected material. These results will be provided to the Department and affected agencies for their review and use.

2. CHA shall assist the Department in all coordination activities which involved federal, state and local agencies.

3. CHA shall prepare an Asbestos Assessment Technical Memorandum which documents and summarizes the findings and evaluations of the asbestos investigation techniques employed. The report shall, if appropriate, provide recommendations for design and construction activities which may service to mitigate or reduce potential project involvement with asbestos. The report will provide recommendations for removing asbestos from the project, if required. Suitable copies of the report will be submitted for review and approval by the Department.

M. Cultural Resources Study

1. CHA shall perform a Cultural Resource Study for the project. Work shall comply with the requirements for the protection of the nation's cultural resources as mandated by the Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, Executive Order 11593, the Archaeological Conservation Act of 1974, the State Historic Preservation Requirements of the Historic Preservation Office.

   All cultural resources survey work shall be performed by, or under the supervision of, a professional archaeologist and/or historian, who shall coordinate field operations with the Department prior to entry on private lands. Any cultural materials recovered shall remain the property of the Department and shall be delivered to the Department for disposition.

   Work shall include:

   1. Background Research and Reconnaissance

      a) A comprehensive preliminary search to identify sites within the project area which are listed on or nominated to the National Register of Historic Places, as well as other sites or regional characteristics of historic or cultural significance.

      b) A reconnaissance field survey to locate and check the condition of sites tentatively identified by or not noted in the preliminary search, and to identify areas where historic properties are lacking or are likely to occur.

c) A Reconnaissance Report, summarizing the results of the preliminary search and reconnaissance survey and presenting a projected study program for a more detailed survey of significant sites.

2. Intensive Survey

a) An intensive survey to examine in detail each site of importance determined by the background research and reconnaissance that will be impacted by the design alternatives shall be conducted. CHA shall inventory impacted sites potentially eligible for the National Register as determined by eligibility criteria. The State shall determine which sites will be subject to an intensive survey and direct CHA to proceed.

b) CHA shall prepare summary documentation reports for those sites determined to be listed or eligible for the National Register that are impacted by the project.

3. Cultural Resources Study Report

A final report consistent with Federal Section 106 (36 CFR Part 800) requirements describing all work performed, including but not limited to the preliminary search, reconnaissance survey, and intensive survey. The report shall contain a bibliography of data sources, maps or plans showing the relationship of the findings to the design alternatives, and a discussion of the impact of each alternative on cultural resources. CHA shall provide suitable copies of this report. A separate summary of this report shall be prepared by CHA and included in the DEIS.

4. CHA shall revise the Cultural Resource Study Reports to incorporate the Department's review comments. The report will be sent to SHPO, FHWA, and the Advisory Council on Historic Preservation (if appropriate).

N. Socio-economic Study

1. Data Collection

The collection of socio-economic and land use data will focus on describing existing conditions, as well as providing a base-line for future projections. All data collection activities will be coordinated with the Strafford Regional Planning Commission.

In collecting data and other pertinent information, a number of federal, state, regional and local agencies will be contacted. These agencies include, but are not limited to the following:

- U.S. Bureau of the Census
- U.S. Department of Agriculture
- U.S. Department of Commerce
- New Hampshire Office of State Planning
- New Hampshire Department of Employment Security
- New Hampshire Department of Revenue Administration
- New Hampshire Department of Resources and Economic Development
- Strafford Regional Planning Commission
- Local Planning Boards and Economic Development Agencies
- Local Chambers of Commerce

a) Economic Data

Special attention will be directed at collecting current and historical data concerning the industrial and commercial components of the economy. This information will be compared with data concerning vacant land parcels adjacent to the various proposed exits. This information will be used to describe existing economic conditions in the three cities as well as the region. Key economic factors will be identified and will be used to evaluate the impacts of various exit alternatives. A data base incorporating the following factors will be prepared:

- Employment - types and mix
- Income
- Size and types of business
- Size of labor force

b) Social Data

Data that describes the existing population and housing mix, as well as the location and types of community facilities available in the project area will be collected. Population and housing information will be based on 1990 U.S. Census data and incremental updates prepared by the New Hampshire Office of State Planning. Supplemental information will be obtained from property tax files, as well as an evaluation of the real estate market in the project area. Information about various community facilities and services will also be collected.

c) Land Use Data

A determination of existing land use conditions will be made by collecting property data from assessment records. This data will then be analyzed to determine changes in land uses that have occurred since local Master Plans were prepared by the communities within the project area.

Present market conditions for land uses will be evaluated along with existing zoning ordinances and land use regulations. Based on this evaluation, projections will be prepared concerning the potential for future development.

2. Identification of Socio-economic and Land Use Issues

A variety of socio-economic and land use issues, relating to the various alternatives for the location of Exit 10, will be identified. It is anticipated that at a minimum the following factors will be examined:

- o Consistency with regional and local land use and economic plans.
- o Community preferences and concern.
- o Possible impacts on community facilities and services.
- o Future commercial, industrial and residential development possibilities.

Based on this identification process, a preliminary matrix of important issues will be prepared. This matrix will be used to identify key socio-economic and land use factors that could be impacted by the construction of a new Exit 10. This issue identification process will provide the basis for evaluating possible impacts.

3. Evaluation of Socio-economic and Land Use Impacts

Long-term socio-economic and land use impacts associated with each alternative will be determined. The analysis will evaluate direct, secondary and cumulative impacts. All impacts will be based on growth projections prepared for this project. This analysis of impacts will involve four specific activities.

- o Direct land use impacts of the various exits.
- o Regional and local economic and social impacts.
- o Economic consequences of no build alternative.
- o Methods to minimize adverse socio-economic and land use impacts.

O. Flood Plain Study

1. CHA shall perform a flood plain study for the project in accordance with the requirements of the FHA's FAPGG 650, Location and Hydraulic Design of Encroachments on Flood Plains. The detail of this evaluation shall be commensurate with the risks associated with encroachments into the flood plain and with other economic, social or environmental concerns. CHA shall provide suitable copies of this flood plain evaluation that shall:

   a) Evaluate and discuss the practicability of alternatives to any longitudinal or other significant encroachments into the flood plain by the proposed design alternatives.

b) Discuss the following items with regard to each project alternative: The risk associated with implementation of the action; The impacts on natural and beneficial flood plain developments; Mitigative measures; Measures to restore and preserve the natural and beneficial flood plain values impacted by the action.

c) Support the "Only Practical Alternative Finding" of FAPGG 650 for a significant encroachment including:

Reasons why the proposed action must be located in the flood plain. Alternatives considered and why they were not practicable. A statement indicating whether the action conforms to applicable state or local flood plain protection standards.

d) CHA shall revise the Flood Plain Evaluation Report to incorporate the Department's review comments.

e) CHA shall summarize the results of the Flood Plain Evaluation in the appropriate section of the DEIS.

If at that time it is decided that the project in question will be a Class I action project and an early hydraulic analysis is necessary, then CHA will obtain all the necessary information and perform hydraulic analysis and evaluation of the proposed project including the water profiles for the existing and proposed structure for both the Design Flood (Q50) and the Basic Flood (Q100) and also the overtopping flood whenever applicable.

f) Evaluate and support the specific design features of the roadway elements of each alternative encroaching on the flood plain with regard to construction cost and risks, and to other economic, social and environmental concerns by determining the magnitude, approximate probability of exceeding and at appropriate locations, the water surface elevations and velocity associated with:

The flood that would overtop the highway or the base flood, whichever is greater. The greatest flood that must flow through highway drainage structures where overtopping is not practical.

g) CHA shall revise the Flood Plain Study Report to incorporate the Department's review comments and the Federal Emergency Management Agency's comments, if required.

h) CHA shall summarize the results of the Flood Plain Study in the appropriate section of the DEIS.

TASK 5 - PUBLIC PARTICIPATION PROGRAM/INFORMATIONAL MEETINGS/PUBLIC HEARING

A. Informational Meetings and Public Participation

CHA shall prepare for and assist the Department at informational meetings with advisory agencies, advisory task forces, local officials, and citizens, at which CHA shall provide visual aids (including color slides, photographs, colored plans, overheads etc.) and present a technical discussion of the alternatives. The Department shall arrange for the location of these meetings. CHA will attend meetings with the Department prior to the informational meetings to review CHA's visual aids and presentation. CHA will prepare informational newsletters for distribution as directed by the Department.

B. Public Hearing

1. The Department shall prepare and arrange for publication of the required legal notice. The Department shall arrange for the date, time, and location of the Public Hearing, and the Department shall provide stenographic services.

2. CHA shall produce, modify as necessary, and provide suitable copies of a colored informational brochure for distribution. The brochure will describe the proposed project for the public and include five written pages plus photos, renderings, etc.

3. CHA shall provide visual aids and displays specifically for use at the Public Hearing. These shall consist of similar materials to those used at information meetings modified for the different audience, and updated with the most current project information.

4. CHA shall attend meeting(s) with the Department for the purpose of reviewing CHA's visual aids, displays and Public Hearing presentation.

5. CHA shall modify the visual aids, displays, and presentation to incorporate comments on them from the Department.

6. CHA shall attend the hearing, which will be conducted by the State. CHA shall present the technical discussion of the design alternatives. CHA shall assist the Department with installing, managing, and dismantling informational displays and other visual aids.

TASK 6 - DEIS COMMENT RESOLUTION/FEIS PREPARATION

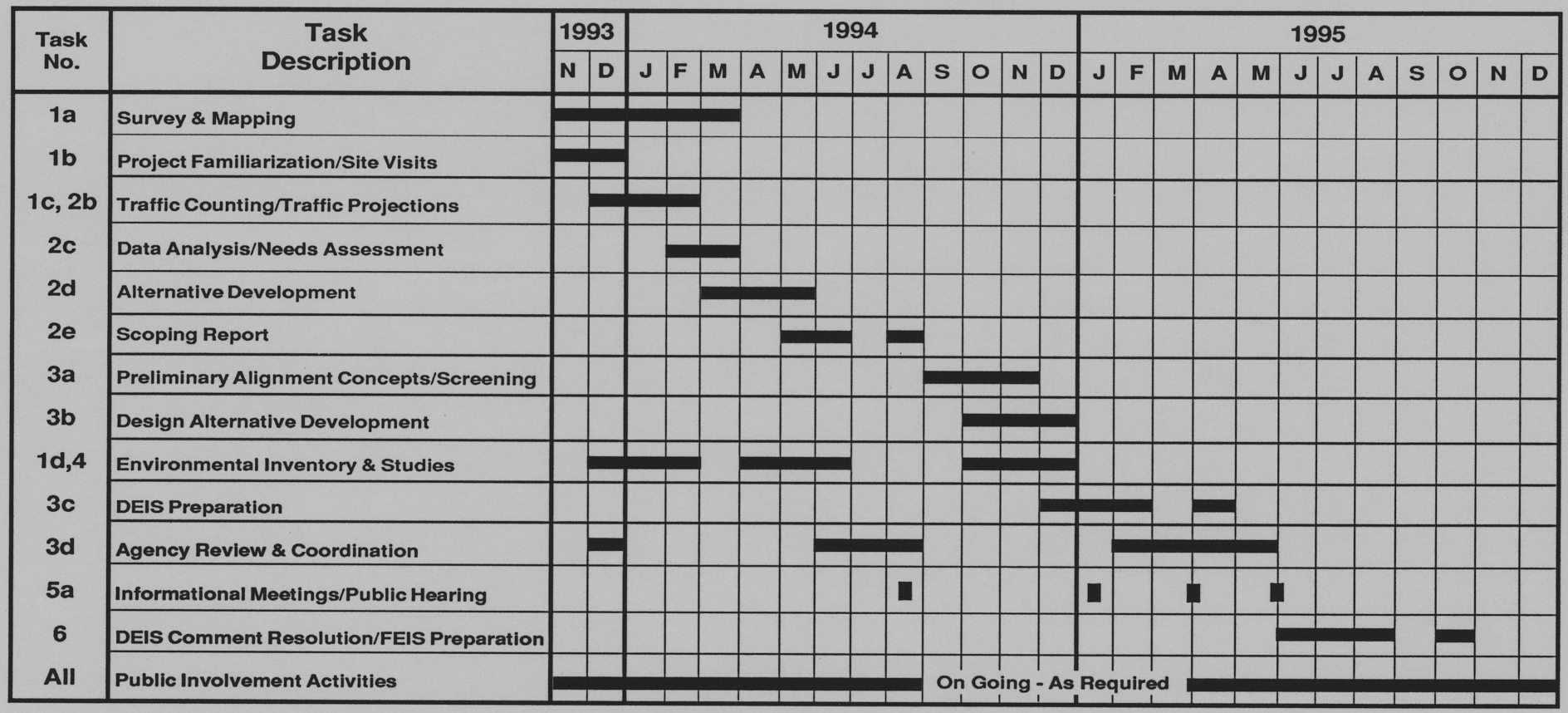
1. CHA shall assist the Department in analyzing the hearing transcript and written statements.

2. CHA shall modify the DEIS to include the design recommendation, update existing conditions and costs as necessary, and incorporate any changes resulting from review. The modified report will be titled "FINAL ENVIRONMENTAL IMPACT STATEMENT". CHA shall provide suitable copies of a draft for preliminary review.

3. CHA shall make minor revisions to the Draft FEIS to incorporate final review comments, and shall provide suitable copies for design approval processing.

4. The Department shall prepare required legal notices for publication, and shall obtain all necessary approvals and concurrences, including the approval of the recommended design.

Project Schedule



Key Dates

❑ Start of Work	11/93 (Est.)	❑ DEIS	4/95
❑ Initial Scoping Report	6/94	❑ Public Hearing	6/95
❑ Final Scoping Report	8/94	❑ FEIS	10/95
❑ Pre-Draft DEIS	2/95	❑ Design Approval	11/95

CHA
CLOUGH, HARBOUR & ASSOCIATES
ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS

Exit 10 - Spaulding Turnpike
Dover - Somersworth - Rochester

REPRESENTATIVE PROJECTS

Interstate 90/Interchange 8 Connector to Route 4

Preliminary design including the development of Design Report/Environmental Impact Statement with Section 4(f) evaluation for a proposed multi-directional interchange and connector roadway to provide access from Interstate 90 to NYS Route 4 in the study area. The project included development of corridor location and design alternative studies and evaluation of environmental impacts in accordance with State and Federal guidelines. The environmental investigations and analyses have included computer modelled air quality and noise analysis with mitigation evaluation, wetland delineation and mitigation, surface water and groundwater quality, surface water hydrology and flood plain impacts, agricultural district impacts, visual resource assessments, cultural resource assessments, geological and ecological research, hazardous waste assessments, energy analyses, compliance with environmental laws, regulations and permits and Section 4(f) property evaluations.

During the preparation of the Environmental Impact Statement Clough, Harbour & Associates prepared and performed technical presentations at public informational meetings and a Combined Corridor/Design Public Hearing.

Final design will include development and monitoring of an extensive geotechnical program, design of extensive wetland mitigation plans, and development of multiple construction staging and maintenance and protection of traffic sequencing scenarios.

New York State Thruway Exit 26/Mohawk River Crossing

Preliminary design including traffic analysis, design alternative studies, and the development of a Design Report/Environmental Impact Statement for a new bridge spanning the Mohawk River with the associated ramps and connector roadways to connect Thruway Interchange 26, Interstate 890, and NYS Route 5S in the Town of Rotterdam with NYS Route 5 in the Town of Glenville. The project included the development and analysis of several design alternatives for a new interchange that provides for all traffic movements between Thruway Interchange 26, Interstate 890, NYS Route 5, and the bridge; alignments that traverse beneath, at-grade, and above the Boston & Maine Railroad track; both at-grade and grade separated intersections between NYS Route 5S and the bridge connector roadway; and bridge option studies including concrete box girder, steel girder, steel arch, through truss, and pre-cast concrete I-girder bridge types.

The environmental investigation and analysis included computer modelled air quality and noise analysis with mitigation evaluation, wetland delineation and mitigation, surface and groundwater quality including analysis of impacts to the Schenectady/Niskayuna Sole Source Aquifer, surface water hydrology and flood plain impacts, agricultural district impacts, visual resource assessments, historical and cultural resource assessments, geological and ecological studies, energy analysis, environmental compliance, and environmental permit processing.

Clough, Harbour, & Associates has also begun final design for the interchange and connector roadway south of the Mohawk River.

Corning ByPass Southern Tier Expressway, Corning, New York

Retained as a subconsultant for Design Phases I-IV to perform all of the environmental studies and prepare the Draft and Final Environmental Impact Statement for the project which consisted of three miles of four lane expressway with climbing lanes, with two interchanges on new alignment, numerous local highway improvements, and perform a Section 4(f) evaluation. Because the project passes through two villages and the City of Corning and over two flood plain areas, there were numerous environmentally sensitive issues requiring very comprehensive studies. These included flood plain studies, noise studies, Level II and I air quality studies and aesthetics, and a hazardous waste and asbestos assessment, including sampling, and community and natural resource impacts. Clough, Harbour & Associates was responsible for preparing for and making full presentations at numerous information and workshop meetings and the public hearing. FHWA design approval was obtained.

Interstate 90/Thruway Exit 24 Interchange

Planning studies, preliminary design alternatives, environmental studies, final plans, specifications and estimates, and construction inspection for the reconstruction of the I-90/I-87/Thruway Exit 24 interchange near Albany, New York. The $54 million project consisted of major construction of ramps, construction of additional lanes along freeway mainlines to improve capacity, construction and/or rehabilitation of 20 structures, and construction of a new 13-lane toll plaza.

With over 100,000 vehicles passing through the project on a daily basis, an elaborate staging plan was developed with over 50 distinct phases to ensure unimpeded traffic flow through the construction area. Temporary ramps (many later used as permanent) were designed to allow the contractor access to the work area for new ramps and bridges. Due to high speed traffic, temporary concrete barriers were used extensively to separate and protect the work area.

Final design (PS&E) for the I-80 WB to I-87 NB ramp structure , a 420' continuous 3-span cured multi-girder structure over Rensselaer Lake and the I-87 NB Conrail crossing, which consisted of the rehabilitation of the existing 3-span, 3 lane bridge and additional widening to add two travel lanes and a full shoulder. Railroad (Conrail) operations were continuously maintained, even through clearances of the existing and new piers to the main rail line were restricted.

Innovative contracting methods and schedules and accelerated structural design was required to meet the project schedule. Several environmental issues dealing with drainage, park lands, pedestrian and bicycle areas, and construction near a solid waste landfill were successfully handled in an expeditious manner.

Susquehanna River Crossing, Broome and Tioga Counties, New York

This project consists of traffic origin/destination studies, needs analyses, cost benefit studies, preliminary design and environmental impact studies for a proposed $35,000,000 bridge over Conrail and the Susquehanna River between Routes 17C and 434 in Broome and Tioga Counties, New York. The pre-development (traffic) studies required an extensive data collection program that included roadside interviews and postcard mailback surveys for 12-hour periods at seven critical locations within the project area. In addition to the origin/destination data, the study included daily and peak hour traffic counts (machine and manual), travel time surveys, accident analysis, and investigations of geometric features on the existing roadways. Future traffic projections were made using the computer modeling software "T-MODEL2". A needs analysis is to be developed to identify potential user benefits for each of the 4 alternatives under consideration. These alternatives will also be investigated for their environmental impacts including noise, air quality, surface water quality, groundwater, wetlands, ecological, floodplain, energy, visual resources, hazardous waste, and asbestos studies; their cultural, historical and archaeological impacts, and their compliance with environmental laws, regulations and permits. The issues that make this area particularly sensitive are its proximity to a Superfund dump site, its large drainage area, its wetlands, and its archaeological significance. The Design Report/Environmental Impact Statement will identify the recommended alternative that undergoes intensive public scrutiny at informational meetings and hearings.

Chittenden County Circumferential Highway, Section 2

Preliminary and final (PS&E) engineering design for Section 2 of the Chittenden County Circumferential Highway in the Town of Essex, Vermont. This project consists of two miles of new highway and a complex interchange layout in the Vermont Route 2A valley. The design includes six bridge structures, two highway grade separations and four crossings of the Central Vermont Railroad, and numerous major culvert structures. Structural design included pile supported foundations, heavily skewed substructure units in areas with poor soil constraints. Considerable rock excavation is necessary through the escarpment east of the Central Vermont Railroad, with rock cut depths in excess of 100 feet. The project also includes a major realignment of a town highway.

Due to the proposed timing for the construction of the different sections of the Circumferential Highway, it was necessary to produce final design drawings for both an initial partial interchange construction and the final full interchange built-out. The staging plan required complex provisions for the maintenance and protection of traffic and construction sequencing arrangements. In addition, the highly compressive soils in the Route 2A valley required special geotechnical design measures to accelerate embankment settlement and improve foundation soil shear strength.

CHA worked closely with the Central Vermont Railroad to coordinate the structural design in adherence with rail standards and operations. A number of design issues had a potential impact on the operation of their facility, including the discharge of surface water runoff under the railroad and the prevention of uplift of the track during adjacent embankment construction.

The critical schedule for the project's design required a close working relationship with the client, Vermont Agency of Transportation, and the Agency's management contractor to ensure key dates for final design plans and right-of-way plans were achieved.

Chittenden County Circumferential Highway, Section 3

Preliminary engineering and PS&E for structural design of Section 3 of the Chittenden County Circumferential Highway in the Town of Colchester, Vermont. As structural design subconsultant, our engineering services on this project included design of three grade separation structures at new interchanges. The project involved design of bridge structures with high abutments on poor subsurface strata. Foundation types included both cast-in-place concrete on pile foundations and the use of a mechanically stabilized earth system. The estimated construction cost of the structures in this project is approximately $3 million.

New York State Thruway, Niagara Section

Plans, specifications and estimate for the reconstruction of the New York State Thruway, Niagara Section in the City of Buffalo, New York. This $25 million urban expressway projects includes reconstruction of 2.8 miles of roadway, rehabilitation of six structures, drainage design, ramp and geometric design, and safety improvements to barriers and lighting. Due to its close proximity to downtown Buffalo and the Niagara River, this project required several complex maintenance and protection of traffic schemes to provide the necessary work zones on this confined urban right-of-way. Constructability review in-house and with the Thruway Authority resulted in the development of a sequence of construction that will facilitate the construction of this segment and adjacent segments simultaneously and still maintain the overall safety and integrity of the heavy traffic volumes on this major expressway.

Rensselaer Port Access Connector Roadway, City of Rensselaer, New York

This project included the preparation of the preliminary (Design Report/Environmental Assessment) and final (PS&E) design of a proposed connector roadway servicing the Rensselaer Port area in the City of Rennselaer for the New York State Department of Transportation. This project included the construction of approximately one (1) mile of roadway and two (2) structures. The first structure was a 300 foot two span curved girder bridge spanning a Conrail mainline track. The second structure was a 90 foot multi-girder single span bridge crossing a spur line which services the Port of Rensselaer on the Hudson River.

Several alignment revisions were necessary during preliminary design due to design constraints within the project area.

One of the design constraints was an Army Corp regulated wetland. Several alignment revisions were made to minimize the impact on this wetland area. An Army Corp 404 permit was also developed for involvement with this wetland. The preferred alignment was also adjacent to a closed landfill containing industrial wastes. A chemical boring and testing operation, developed and inspected by CHA, revealed the presence of toxic wastes within the embankment limits of the proposed roadway. CHA coordinated the removal of the wastes to a secure side and also reviewed a field health and safety plan developed by the Contractor for work within the vicinity of the closed landfill.

Another design constraint was the narrow right-of-way at the northern terminus of the project. Finalizing the alignment in the area required several meetings with various utility companies and adjacent property owners to develop an acceptable design.

The project also involved meetings with Conrail to discuss railroad operations and railroad requirements.

Exit 26/Interstate 890 Study

The Exit 26 Study consists of an evaluation of existing and future transportation needs in the Schenectady/Scotia, New York area in the vicinity of the New York State Thruway Exit 26. An extensive data collection program was required which included: conducting peak hour and daily traffic counts, travel time surveys, inventory of existing traffic controls, postcard/mailback and roadside interview origin/destination surveys. A key feature of the Origin/Destination Study conducted for this project was to collect information on the number of through trucks within the City of Amsterdam that were exiting the Thruway at Exit 27 and using NY Route 67 as a short cut to Interstate 87 and points North. The project included transportation network modeling using the "T-MODEL" system to project future traffic volumes, analysis of existing and future traffic volumes to determine level, of service, delay and travel speeds. This study also included the evaluation of short and long term transportation solutions in terms of improved traffic flow benefit/cost analysis and accident reduction. Potential short term solutions included intersection approach widening and traffic signal improvements including phasing, timing and interconnection. Potential long term solutions included the construction of a new bridge over the Mohawk River connecting the NYS Thruway at Exit 26 and Interstate 890 with NYS Route 5. The evaluation of this alternative include identifying traffic diversions that would be created by the bridge. The technical evaluation was completed in June 1987.

Boght Road Area Generic Environmental Impact Statement

The purpose of the Boght Road Area GEIS was to evaluate the environmental impacts of pending development in a 4,100 acre area within the Northern Section of the Town of Colonie. Transportation impacts were a key feature evaluated in the GEIS which included developing a model to forecast future traffic flows. Several roadway improvement scenarios were evaluated including providing an additional interchange with NY Route 7, a 4 lane limited access facility in this area. The total construction value of the improvements recommended was estimated at $11 million. The Town is currently collecting mitigation fees from developers within the study area and is in the process of developing a capital improvement plan.

Krumkill Area Planning Study

The Krumkill area within Albany County, New York which includes portions of the Towns of Guilderland, New Scotland and Bethlehem, is a suburb of the City of Albany which is expected to experience significant development in the near future. Forecasts developed by the Town indicated between 2,000 and 6,000 new residential dwelling units are proposed for the Krumkill areas by 1997. This study was prepared to evaluate the capacity and safety needs of the roadways within the Krumkill area. The micro-computer transportation model "T-MODEL" was used to project the increase in traffic flows due to the anticipated development. The Final Report of this study, completed in September 1988, recommended the implementation of a package of roadway improvements including intersection improvements and "By-Pass" roadways. The estimated construction cost of the recommended improvements is $8.5 million. Construction has recently been completed on two of the major recommendations in the Krumkill Study.

Route 7 Wetland Delineation and Mitigation, Norwalk, Connecticut

Clough, Harbour & Associates worked closely with the U.S. Army Corps of Engineers and the Connecticut Department of Environmental Protection in wetland delineation and the development of mitigation plans associated with the construction of Route 7 in Norwalk, Connecticut. Responsibilities included the delineation, classification and protection of several wetlands which were both contiguous with, and tributary to the Norwalk and Silvermine Rivers. The delineation work was accepted by the U.S. Army Corps of Engineers and instrumental in obtaining the required wetlands permits from the U.S. Army Corps of Engineers and the Connecticut Department of Environmental Protection. CHA was also responsible for the identification of areas to be disturbed by the project, review and comment on mitigation plans prepared by environmental consultants, coordination with the Army Corps and Department of Environmental Protection, and monitoring/inspection of wetland mitigation activities. The project involved the successful creation of approximately 20 acres of wetland which required in excess of two years for completion. CHA was also responsible for the planning and implementation of on-site sedimentation, erosion and water pollution controls. Other duties performed in this capacity included the creation of a water quality monitoring program which the client used on all highway construction projects.

INTERCHANGE 8/I-90 CONNECTION to ROUTE 4

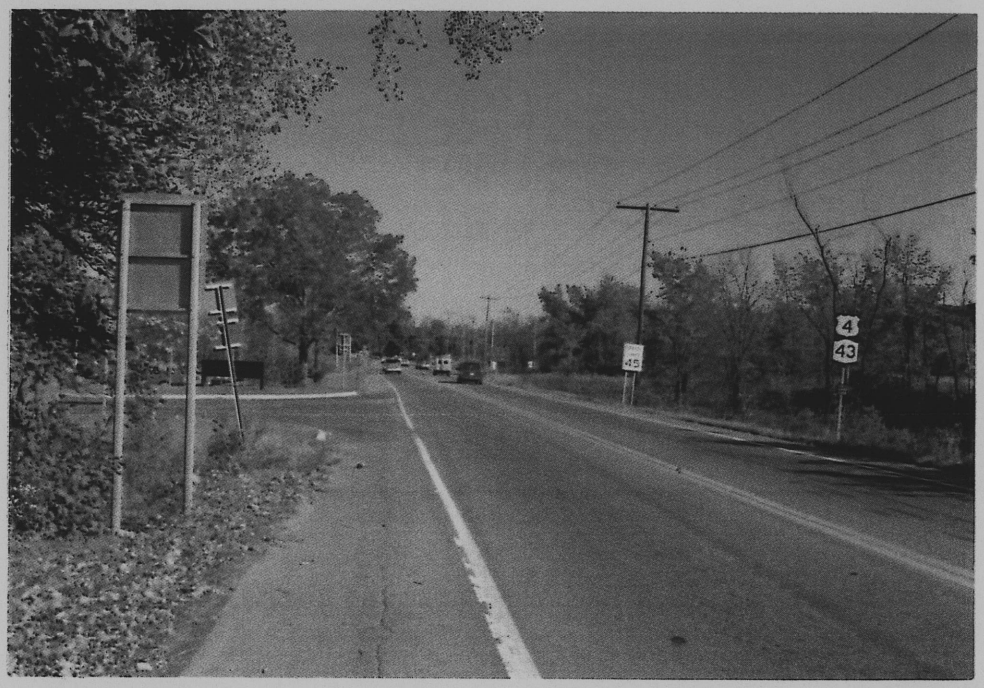
Preliminary Design Phases I-IV/Environmental Impact Statement

Rensselaer County, New York

Interstate 90 (I-90) is a major link connecting Albany to the Berkshire Section of the New York State Thruway. The Interchange 8/I-90 connection to Route 4 would provide for a multi-directional interchange and direct highway connection to improve access between the Interstate and the study area.

Clough, Harbour & Associates provided professional services which included field surveying, preliminary alternative designs, environmental studies and analyses, and development of the Environmental Impact Statement with Section 4(f) involvement. Environmental studies and analyses performed by *CHA* included:

Land Use
Social/Economic
Air Quality
Noise
Water Body Modification
Water Quality
Flood Plain
Wetland (inc. delineation)
Vegetation/Wildlife
Historical/Archaeological
Hazardous Materials
Visual Resources
Energy



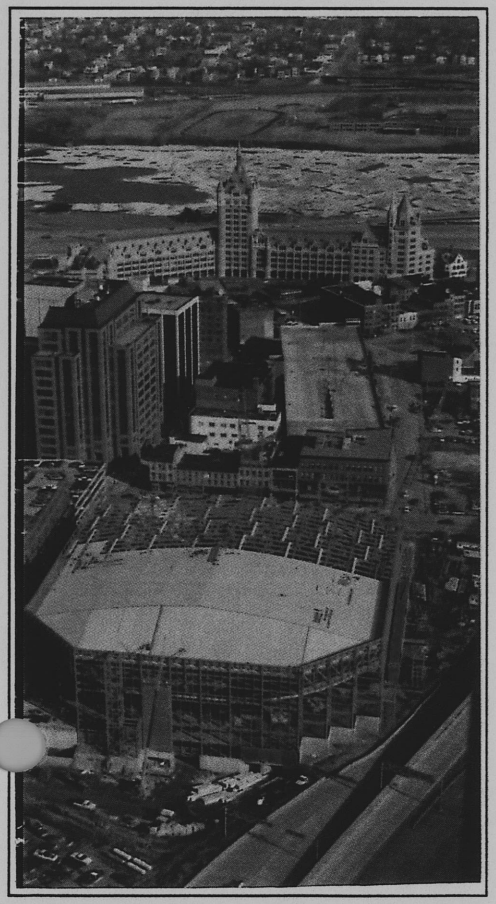
Horizontal & Vertical Geometry - Intergraph Inroads
Air Quality Analysis - NYSDOT Intersection Midblock Model
Noise Analysis - Stamina 2.0/Optima
Hydrologic/Hydraulic Analyses - TR55, HECII
Wetland Delineation - Section 404 Clean Water Act

CHA

Albany County Civic Center
Environmental Impact Statement
Albany, New York

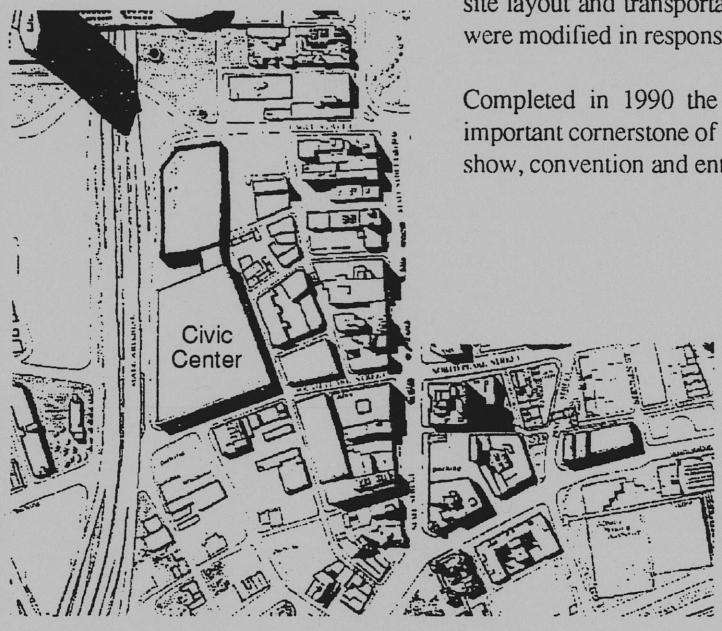
Clough, Harbour & Associates was retained by Albany County to prepare an environmental impact statement for the 15,000 seat multi-purpose Civic Center located in the Capital City of New York State. The 50 million dollar complex also included a 1000 car parking garage, transportation center, retail space and an elevated enclosed pedestrian walkways connecting the Civic Center with the Empire State Plaza and adjoining businesses.

Located within the heart of downtown Albany's Central Business District, Clough, Harbour & Associates' urban planners were faced with the complex task of determining the potential impacts the Civic Center would have on infracture, community services, historic character, transportation network, economic structure, and visual quality of the City's skyline and streetscape.



One of the most challenging aspects in preparing the environmental impact statement was the analysis of alternative sites, scale and design. The analysis presented and exhaustive study of the socio-economic and environmental impacts of these alternatives.

Over a period of three years, Clough, Harbour & Associates' urban planners prepared and presented the environmental impact statement documents at numerous public informational meetings throughout Albany County. Important issues were raised by the public and many aspects of the Civic Center's architectural design, site layout and transportation improvements which were modified in response to these public concerns.



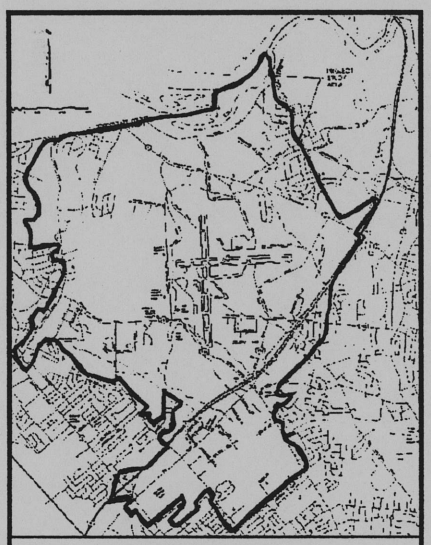
Completed in 1990 the Civic Center is now an important cornerstone of the Capital Districts trade-show, convention and entertainment economy.

CHA

Airport Area
Generic Environmental Impact Statement
Town of Colonie, New York

The Airport Area generic Environmental Impact Statement (GEIS) was a complex undertaking funded by the County of Albany, town of Colonie and Village of Colonie to assess the cumulative impacts of proposed development within 8,500 acres of land surrounding Albany County Airport. **Clough, Harbour & Associates** was retained to prepare the GEIS which included the projection of development over a 15 year planning period along with the identification of potential impacts and mitigation measures development would have on the areas infracture and community services.

The study area was uniquely diverse in the types of land uses that had developed



Airport Area

since the early 1960's. The Wolf Road corridor which includes over 3 million square feet of commercial and office space has emerged as a regional economic and employment center. This is in sharp contrast to much of the land that still remains in agricultural use. Identifying a growth scenario that would balance the need to project environmentally sensitive areas while allowing for economic growth was the most difficult challenge that confronted Clough, Harbour & Associates' professional planners. Clough, Harbour & Associates collected data from Town and Village Planning Boards and regional planning agencies to identify potential development levels at the end of the planning period. Based on this analysis, potential environmental and socioeconomic impacts were identified. Mitigation proposed included the assessment of mitigation fees for new development to offset additional demand on existing transportation, water supply, municipal and recreation facilities. This project was completed over an 18 month period and will result in the preparation of long-term capital improvement programming for the Airport Area.

CHA

Village Lake Associates

Harrisville, New Hampshire

Wetland Services

Project Description

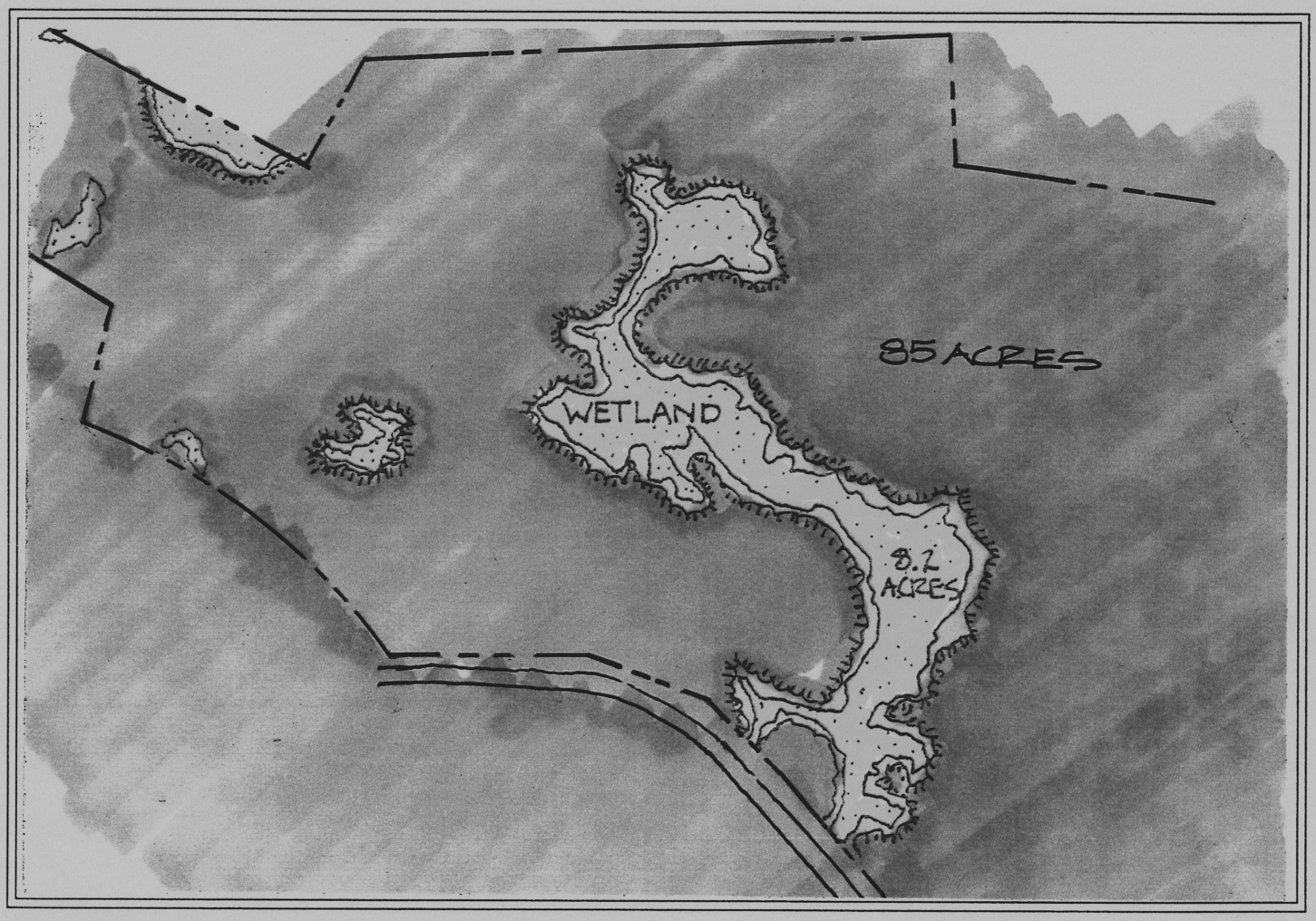
Clough, Harbour & Associates was responsible for the delineation of a 110 acre private residential development adjacent to Harrisville Pond, a public water supply for local residents. The property was located on a side slope of the pond and included numerous terraces. Based upon soil and groundwater characteristics, these terraces were determined to be wetlands pursuant to Federal and local regulations. CHA submitted a surveyed delineation map to the Town for review during the subdivision approval process.

CHA

Carl B. Thomas Construction Company

Keene, New Hampshire

Wetlands Delineation



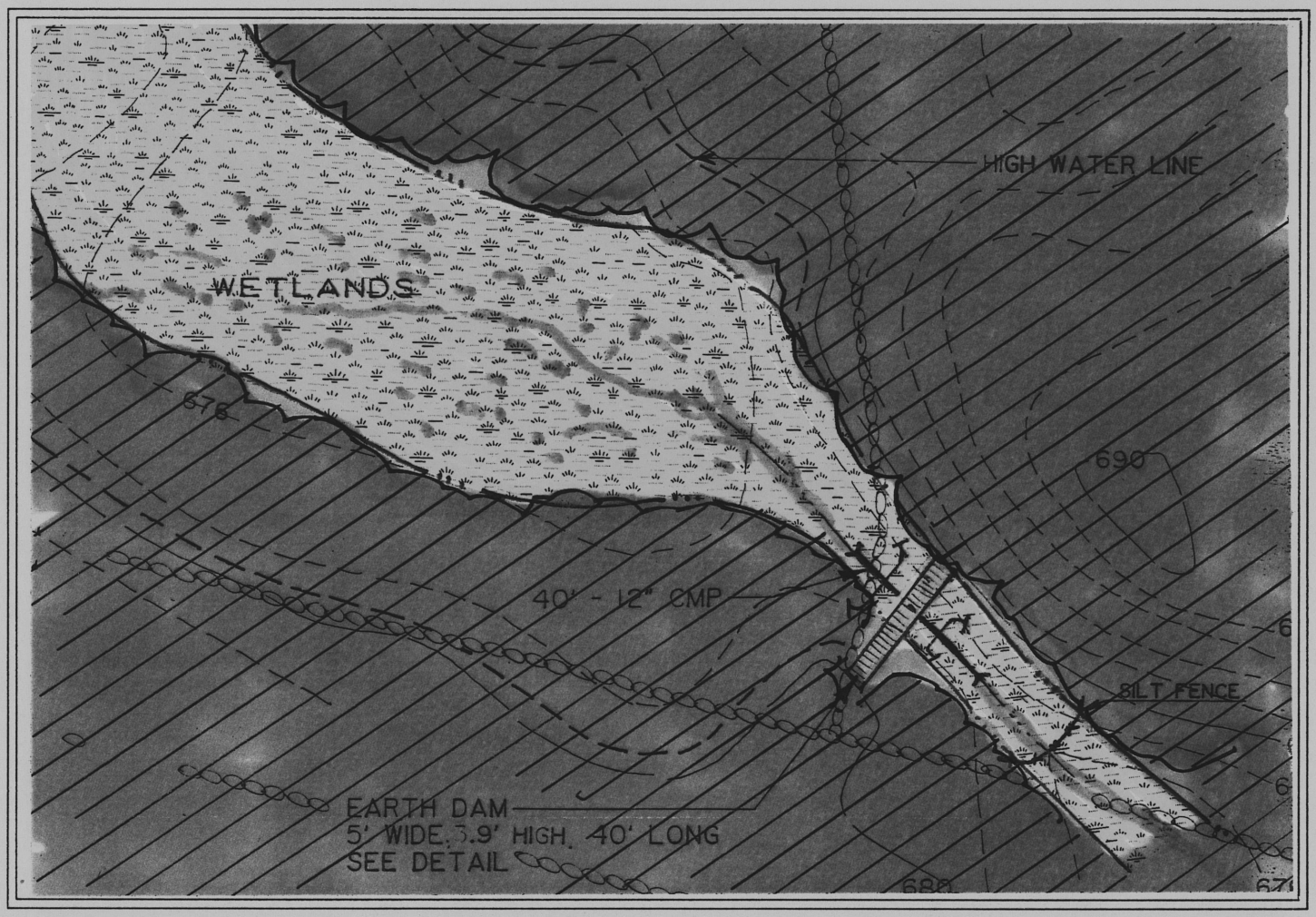
Project Description

Completion of this project included flagging of wetlands edges based on soils, hydrology and vegetation over an 85 acre site by a qualified wetlands biologist. Wetlands edges were surveyed and tied into existing boundary monumentation. A report was generated outlining the biologist's findings including the extent and quality of the wetlands, their potential impact on the proposed industrial project and potential permitting issues related to development in proximity to them.

Stow Mills

Chesterfield, New Hampshire

Wetlands Delineation & Drainage Design

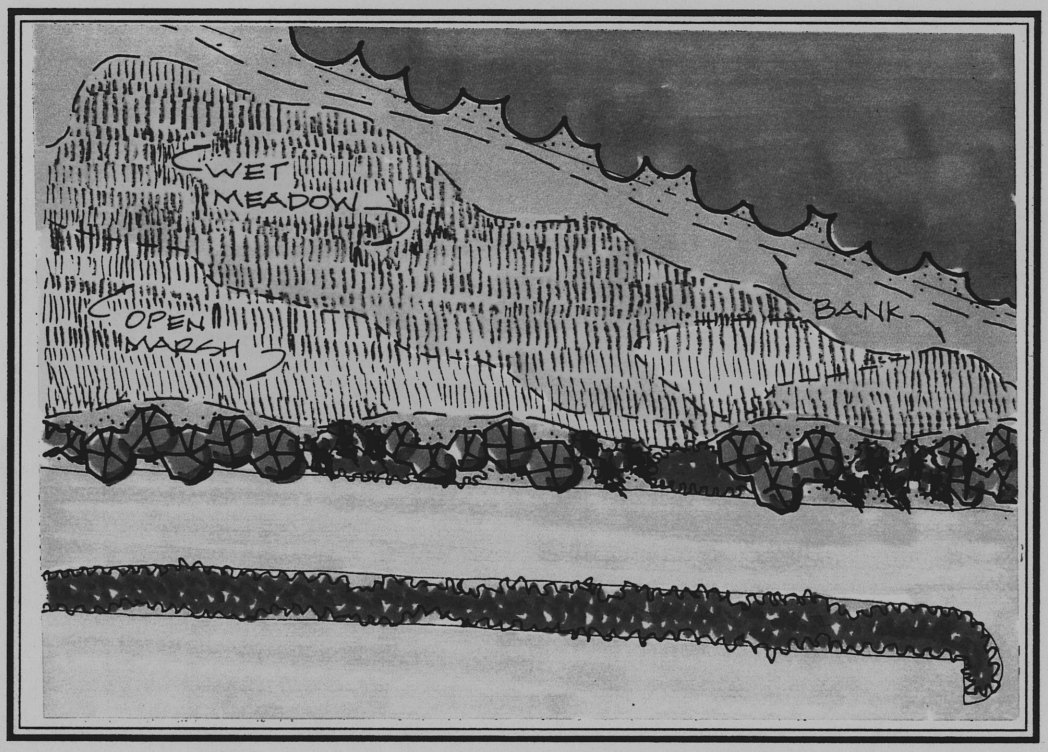


Project Description

As part of the approval process for a 64,000 Sq. Ft. expansion of the existing industrial facility a Wetlands Dredge and Fill Permit application was submitted to the State of New Hampshire Wetlands Board and was subsequently approved. Preparation of the permit documents included delineation of wetlands under current State of New Hampshire regulations and a report on the relative quality of the existing wetlands. The design concept included using the existing storage capacity of the wetlands augmented by outlet control to provide stormwater detention. Project staff submitted runoff calculations and outlet control design to the Wetlands Board for review as part of the permitting process.

Latham Farms

Wetlands Creation



Project Description

As part of the approval process (Section 404 of the Clean Water Act) it was necessary to provide wetland creation for areas of wetland that could not be avoided.

The project represented the disturbance of approximately 0.73 acres of deciduous forest swamp (PFOIY) and approximately 1.20 acres of emergent swamp (PEMIY). The plan proposed the creation of 1.94 acres of wetlands, in order to promote "in-kind, in-place" replacement of the wetlands where possible. A general replacement of wetland function for function was implemented, the creation plans represented an extension of existing wetlands rather than creation of new wetlands to improve the success rate.

The **Clough, Harbour & Associates'** team of biologists, geologists, hydrogeologists, soil scientists, engineers and landscape architects were responsible for the design and preparation of these plans.

CHA

STATEMENT OF QUALIFICATIONS IN THE ECONOMIC ANALYSIS OF TRANSPORTATION PROJECTS

RKG Associates, Inc.

Economic, Planning and Real Estate Consultants

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RKG

STATEMENT OF QUALIFICATIONS IN THE ECONOMIC ANALYSIS OF TRANSPORTATION PROJECTS

RKG Associates, Inc. has provided a broad range of economic consulting services to highway, airport, port and rail transportation projects throughout the United States. Our firm typically serves in the role of a subcontractor to an engineering firm hired to evaluate the feasibility of alternate options or in conjunction with the preparation of an environmental impact statement. RKG Associates work has included analyzing the economic, fiscal and social impacts of alternative proposed highway corridors, evaluating the market potential for converted military airports, and evaluating the financial and market support for an expanded deep water port.

The projects below describe our experience with these types of projects.

Highway Projects

- **Nashua Circumferential Highway** - Prepared a socioeconomic analysis of 32 proposed corridor alignments for this proposed 25 mile bypass around Nashua, New Hampshire. Our client: Parsons DeLeuw, Inc.

- **Route 6 Connector** - Currently evaluating the development impacts, both primary and secondary, on eight communities as a result of alternate alignments to improve the Route 6 corridor from Providence, Rhode Island to Hartford, Connecticut. Our client: Parsons DeLeuw, Inc.

- **Lewiston - Auburn Interchange Study** - Evaluated the development impacts of four proposed interchanges off the Maine Turnpike. Our client: Parsons DeLeuw, Inc.

- **Bath-Lisbon Bypass** - Evaluated the socioeconomic impacts of a proposed bypass around this New Hampshire community. Our client: HMM Associates, Inc.

- **North Conway Bypass** - Evaluated the socioeconomic impacts of alternate bypass proposals around the resort community of North Conway, New Hampshire. Our client: HMM Associates, Inc.

RKG

- **Route 16 Widening** - Prepared real estate acquisition appraisals in Rochester, New Hampshire. Our client: The New Hampshire Department of Transportation.

- **Route 3A Corridor Upgrade** - Evaluated the development impacts of a program to reduce curb cuts and improve traffic flow through a highly congested urban corridor in Weymouth, Massachusetts. Our client: Vanasse Hangen & Brustlin Associates.

- **Franklin-Laconia Bypass** - Evaluated the economic impacts and cost/benefit ratio of the proposed Franklin-Laconia Bypass in New Hampshire. This bypass was proposed as an alternative to the existing Route 3 corridor. Our client: The New Hampshire Department of Transportation.

Airport Projects

- **Pease International Airport** - Prepared a market study and financial forecast for both capital and operating expenses for this former military base in New Hampshire which has been successfully converted to a civilian airport. Our client: Bechtel Inc.

- **Lawrence Municipal Airport** - Prepared an appraisal of this municipal airport and adjacent land. Our client: The City of Lawrence, Massachusetts.

- **Chanute Air Force Base** - Currently working on the financial planning and analysis to assess the feasibility of converting a portion of this former military base in Illinois to a general aviation facility. Our client: Johnson Controls, an airport management company.

- **Eaker Air Force Base** - Prepared an economic and market analysis of the feasibility of converting this former military base in Arkansas into a civilian airport. Our client: The Blytheville-Gosnell Development Authority.

- **Castle Air Force Base** - Currently working on the financial planning and feasibility analysis of converting this former military base to a civilian general aviation airport. This facility is in Merced, California. Our client: Wadell Engineering Corporation.

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Light Rail Projects

- **Niagara Frontier Transit System** - Prepared an economic impact analysis of the 6 mile light rail system in Buffalo, New York. Our client: The Niagara Frontier Transit Authority.

Port Related Projects

- **Port of Portsmouth** - Prepared a market study and financial analysis for the proposed expansion of the Port of Portsmouth, New Hampshire. Our client: Kimball Chase Inc.

- **New Bedford Massachusetts Harbor Master Plan** - Worked with an engineering firm on defining compatible land uses on this marine related waterfront area. Our client: HMM Associates, Inc.

RKG

REPRESENTATIVE CLIENTS

Lending Institutions

- Bank of Boston
- Bank of Vermont
- BayBank
- Bonham
- Casco Northern
- First NH Banks
- First National Bank of Portsmouth
- Fleet Bank
- Hampton Cooperative
- Key Banks
- Marine Midland (N.Y.)
- Mellon Bank (PA.)
- Mid Maine Bank
- World Bank

Professional Service Firms

- Bechtel Civil, Inc.
- C. E. Maguire
- Camp, Dresser & McGee
- Childs, Bertman, Tseckares, & Casandino
- CityDesign Collaborative
- Halliburton NUS
- Frederic R. Harris
- HMM, Inc.
- Hoyle Tanner Companies
- JSA, Inc.
- Kimball Chase Company
- Parsons DeLeuw
- Sasaki Associates
- Stahl Associates
- The Architects Collaborative
- Vanasse Hangen & Associates
- Wallace Floyd & Associates

Legal Firms

- Bingham, Dana & Gould (Boston)
- Boutin & Solomon
- Burns, Bryant, Hinchey, Cox & Schulte
- Choate, Hall & Stewart
- Devine, Millimet, Stahl & Branch
- Donovan & Leisure (N.Y.)
- Mudge Rose (N.Y.)
- Palmer & Dodge
- Pierce Atwood & Scribner (Portland)
- Sheehan, Phinney, Bass & Green
- Wiggin & Nourie
- Verrill & Dana

Public Sector - State

- New Hampshire Port Authority
- Office of State Planning, NH
- Vermont Department of State Buildings
- Department of Environmental Management, MA
- Division of Capital Planning & Operations, MA
- Middlesex County Utility Authority, NJ
- Connecticut Department of Transportation
- Massachusetts Land Bank
- New Hampshire Department of Transportation
- Illinois Department of Transportation

Public Sector - Federal

- Federal Deposit Insurance Corporation
- National Park Service
- RECOLL Management

Local Government

- Ann Arbor, MI
- Atkinson, NH
- Bedford, NH
- Berlin, NH
- Brookline, MA
- Cambridge, MA
- Chicopee, MA
- Concord, NH
- Dunbarton, NH
- Laconia, NH
- Lowell, MA
- Lynn, MA
- Manchester, NH
- Medford, MA
- Montery County, CA
- Nashua, NH
- Newark, NJ
- New Haven, CT
- Salem, NH
- Sunapee, NH
- Weymouth, MA
- Worcester, MA

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REPRESENTATIVE CLIENTS (continued)

Development Authorities

Pease Development Authority, NH
Blytheville Gosnell Development Authority, AR
Urban Development Corporation, NY
Westmass Development Corporation, MA
Manchester Housing Authority, NH
Boston Redevelopment Authority, MA
Grissom Community Redevelopment Authority, IN
River City Company, TN

Builders/Developers

New England Development Company
CDM Development Co.
Channel Builders
Eckman Construction Co.
Hodan Properties
Juster Development Company
Macomber Development Company
The Tamposi Company
The Finch Group, Inc.
The Norwood Group
The Robbins Group
The Spinelli Company
Weston Financial

Non-Profit Organizations

Business & Industry Association of NH
Martha's Vineyard Conservation Commission
Nantucket Land Council
New Hampshire Housing Finance Authority
Society for the Protection of NH Forests
Trust for Public Land
Whale, Inc.

Institutional Clients

Blue Cross/Blue Shield of N.H.
Concord Hospital
Phillips Exeter Academy
Portsmouth Hospital Foundation
Rensselaer Polytechnic Institute
St. Vincent's Hospital
The Fallon Clinics
The New England Center at UNH

Other Private Corporations

D. D. Bean and Co.
Data General
Great Northern Paper Co.
Hitchiner Manufacturing Co.
Legal Seafoods
Liberty Mutual
McDonald's Corporation
Shaw's
Sun Life of Canada
The Henley Group
Timberland Shoe
Yankee Publishing Corp.
Wheelabrator Technologies
Wentworth By The Sea

RKG

RICHARD K. GSOTTSCHNEIDER, CRE

1981-Present President, RKG Associates, Inc. His expertise includes the areas of market research and real estate development feasibility, real property appraisal, regional economics, economic impact studies, economic development, and project financing. Over the past fifteen years he has performed or supervised over 500 projects in these related categories. He has served as an expert witness and mediator on real estate related issues in New Hampshire, Rhode Island, Maine, Vermont, Massachusetts, and New York. He also serves as project manager for major planning projects with multi-disciplinary teams, and is President of a real estate asset management company. He recently completed a three-year term as a director of a local bank.

1978-1981 Market Analyst, Economics Research Associates, Boston, Massachusetts. Advisor to the public and private sector in the areas of real estate development, economic development and urban development and project financing.

1972-1978 Financial and Management Consultant, Touche Ross and Company, Washington, D.C.

1970-1972 1st Lieutenant in United States Army.

EDUCATION

B.S. Resource Economics, University of New Hampshire 1967.
M.S. Resource Economics, University of New Hampshire 1969
Real Estate Appraisal Principles, Basic Valuation Procedures, Capitalization Theory A and B, and Standards of Professional Practice, offered by The Appraisal Institute, Chicago, Illinois

PROFESSIONAL AFFILIATIONS

American Society of Real Estate Counselors (CRE)
State Certified General Appraiser in NH, ME and MA
National Association of Installation Developers
National Association of REALTORS
The Urban Land Institute
Council on Urban Economic Development
Contributing Author, The Real Estate Handbook, 2nd Edition, Dow Jones Irwin, 1989.
Contributing Author, Real Estate Analyses, Dow Jones Irwin, 1990.

RKG

JIMMY E. HICKS

1986-Present **Vice-President for Planning and Principal, RKG Associates, Inc.** Expertise includes the areas of municipal planning, fiscal impact analysis, economic impact analysis, preparation of environmental impact statements, capital improvements budgeting and the preparation of land use ordinances and regulations. He has also served as an expert witness in a number of court cases dealing with land use planning and development.

1983-1986 **Executive Director, Strafford Regional Planning Commission** Responsible for the preparation of zoning ordinances, land use regulations, master plans and impact studies for the Commission, which is composed of 16 member cities and towns and headquartered in Dover, New Hampshire.

1978-1983 **Principal Planner, New Hampshire Office of State Planning.** Responsible for statewide economic development and land use policy formulation.

1975-1978 **Special Assistant, The Council of State Planning Agencies** Responsible for providing land use planning, community development and economic development assistance to state governments in affiliation with the National Governor's Association.

EDUCATION

B.A. Political Science and Economics, Old Dominion University, 1973.

M.S. Urban and Regional Planning, Virginia Polytechnic Institute and State University, 1975.

PROFESSIONAL AFFILIATIONS

American Planning Association
Urban Land Institute
N.H. Planners' Association, President 1985-1986
Maine Association of Planners
Adjunct Instructor, University of New Hampshire
Adjunct Professor, Antioch/New England Graduate School
Board of Advisors, Department of Urban and Regional Planning, College of Architecture, Virginia Polytechnic Institute and State University

1986 - Present: **Vice-President and Principal, RKG Associates, Inc.** Responsibilities include management of the firm's economic and financial oriented consulting services, including the appraisal and research functions. Expertise includes the areas of financial analysis and forecasting, real property appraisal, strategic planning, and marketing. Serves as chief financial officer, overseeing the firm's administrative and accounting activities..

1985 - 1987: **Principal, CS Associates, Durham, NH.** Provide assistance to individuals and companies in the area of strategic and business planning, entrepreneurial management, venture development and technology transfer. Developed and taught a national seminar on business planning using electronic spread sheets.

1983 - 1986: **State Director, New Hampshire Small Business Development Center.** Responsible for the creation and management of a State-wide business consulting program supported by state, federal and private-sector partnerships.

1979 - 1983: **Project Director, University Center for Technical Assistance Program, University of New Hampshire/Economic Development Administration.** Developed and managed public/private initiatives involving venture capital, regional economics, management assistance and information services. **Adjunct Professor**, University of New Hampshire 1985-1988.

EDUCATION

A.B. Civil Engineering and Economics,
Brown University, 1974.
M.B.A. Whittemore School of Business and Economics,
University of New Hampshire, 1979.

APPRAISAL COURSES

Standards in Professional Practice - Parts A&B, Basic Valuation Procedures, Capitalization Theory & Techniques - Parts A&B, Appraisal Regulations of the Federal Banking Agencies, Farm & Land Appraisal, Writing the Narrative Appraisal Report, Environmental Site Assessment.

PROFESSIONAL AFFILIATIONS

National Association of REALTORS
Licensed Real Estate Broker in NH - License #7216
Certified General Appraiser
Maine - License #CG491
New Hampshire - License #NHCG291
Rhode Island - License #A439G
Urban Land Institute
Government Finance Officers Association

RKG

GARY L. MONGEON

1986-Present Economist and Senior Project Manager, RKG Associates, Inc. Expertise includes economic analysis, market research, financial feasibility analysis, preparation of economic development marketing plans and real property appraisal. He has also been involved in the preparation of economic and fiscal impact analyses of proposed real estate projects for municipal governments. Experienced in all aspects of real estate market research, including residential, retail, office, industrial, golf and hotel properties. Has extensive background in preparing economic impact analyses of major transportation projects. Appraisal experience includes industrial/warehouse facilities, shopping centers, mill buildings, office buildings, golf courses and hotel properties.

1981-1986 Executive Vice President, Greater Rochester N. H. Chamber of Commerce. Managed involvement in downtown promotional campaign and industrial development project for this 300 member business association promoting a seven community area in Southeastern New Hampshire.

1980-1981 Senior Planner, Economic Development, Merrimack Valley Planning Commission, Haverhill, MA. Conducted industrial and retail market research for a 15 community region in Northeastern Massachusetts.

1977-1980 Economic Development/Regional Planner, Strafford Regional Planning Commission, Dover, N.H. Prepared and implemented a regional economic development program for a 16 community region in Southeastern New Hampshire.

1976 Staff Associate with the Office of former United States Senator John Durkin, Washington, D. C.

EDUCATION B.A. Economics and Political Science, University of New Hampshire, 1976.

PROFESSIONAL AFFILIATIONS

New England Economic Project
National Golf Foundation
New Hampshire Planners Association

RKG

MICHAEL N. CASINO

1989-Present Project Manager, RKG Associates, Inc. Expertise includes the areas of municipal planning, master plans, capital improvement programs, zoning ordinances, land use regulations and environmental assessment.

1987-1989 Senior Planner, Dover, New Hampshire. Responsible for review of development proposals, environmental analysis, public participation, preparation of revised master plans, wetland regulations, and impact fee ordinances. Also participated in the development of a city-wide geographic information system.

1982-1987 Assistant Director, Strafford Regional Planning Commission, Dover, New Hampshire. Provided planning assistance to sixteen municipalities in southeastern New Hampshire. Responsible for the preparation of a wide range of land use regulations as well as the review of various development proposals.

1981 Planning Assistant, Anderson-Nichols and Co., Inc., Concord, New Hampshire.

EDUCATION

A.A. Graphic Arts and Advertising Technology, New York City Community College, 1977.
B.S. Community Development, University of New Hampshire, 1982.

PROFESSIONAL AFFILIATIONS

American Planning Association
Strafford River Conservancy, Treasurer
Wilderness Society

RKG

DAVID T. MELANSON

1990-Present	Senior Appraiser, RKG Associates, Inc. Co-manager of the appraisal and research department. Expertise includes valuations, market studies, and feasibility analyses. Projects include apartment and condominium complexes, subdivisions, a 95 room luxury hotel, nightclub/restaurant, urban and rural malls, fast food outlets, branch bank and office complexes, urban mixed use buildings, industrial parks, mill complexes, industrial and R&D buildings, an operating landfill, takings and easements for Right-of-Way condemnation, and a 166 unit residential project both before and after the discovery of on-site hazardous waste.
1987-1989	Appraiser, Crafts Appraisal Associates, Bedford, N.H. Responsible for appraisals and feasibility studies of a broad array of properties. Extensive work on appraisals for litigation. Properties analyzed include an 84 acre site for a super-regional mall, a 271 room White Mountain resort, a 1,000 seat church with attached school complex, the development rights of a 244 acre farm, single family subdivisions and condominium projects up to 436 approved units and rural/residential land up to 262 acres.
1985-1987	A.V.P. Commercial Real Estate, First Federal Bank, Nashua, N.H. Underwrote, closed and managed construction loans and commercial real estate loans up to $3,000,000. Commissioned and reviewed appraisals.
1984-1985	Assistant Credit Manager, Snap-On Tools, Seabrook, N.H.
1984	Financial Management Analyst, G.E.C.C., Stamford, CT.
EDUCATION	B.A. Economics, University of New Hampshire, 1983. Summa Cum Laude, Phi Beta Kappa
APPRAISAL COURSES	Basic Valuation Procedures, Capitalization Theory and Techniques Parts A & B, Standards of Professional Practice, Case Studies in Real Estate Valuation, Writing a Non-Residential Demonstration Appraisal, Preparation for General Appraiser Certification, Fundamentals of Real Estate, Fundamentals of Appraising Residential Property, FHLBB Regulation R41B, FHLBB Regulation R41C.
PROFESSIONAL AFFILIATIONS	MAI Candidate, Appraisal Institute State of NH General Certification - Certificate #NHCG-85

RKG

JEFFREY S. DONOHOE

1989-Present Project Manager, RKG Associates, Inc. Expertise includes real estate analysis, market analysis, feasibility studies, redevelopment planning and real property appraisal. Performed an analysis of land and buildings for two Air Force base reuse projects. Appraisal work consists of commercial and industrial properties as well as major subdivisions.

1988-1989 Management Consultant, Concord, NH. Self employed management consultant specializing in financial analysis, business planning, loan proposals, and market research.

1987-1988 General Manager and Accounting Manager, Dealer Services, Manchester, NH. Managed daily production, financial operations and long-term planning of New Hampshire's leading automotive aftermarket company.

1984-1987 Management Consultant, New Hampshire Small Business Development Center, Manchester, NH. Provided management consulting services for small business owners in areas such as business planning, budgeting, forecasting, and analysis of financial statements.

1983-1984 Financial Marketing Analyst, Signal Capital Corporation, Hampton, NH. Involved extensively in both credit and marketing functions. Responsible for the evaluation and recommendation for credit approvals. Designed and implemented the telemarketing program, as well as research to determine new markets for the company.

1981-1983 Associate Manager, Beneficial Finance, Manchester, NH. Responsible for credit decision making, delinquency control, processing and closing of personal and mortgage loans.

EDUCATION B.S. Administration, Whittemore School of Business and Economics, University of New Hampshire, 1981.
M.B.A. Bentley College, Waltham, Massachusetts, 1984.

Victoria Bunker, PhD

Consultant in New England Archeology
and Cultural Resources Management

RR 1, Box 195E • Africa Road • Alton, NH 03809 • (603) 776-4306

RECEIVED
AUG 18 1993
CLOUGH, HARBOUR
& ASSOCIATES

August 13, 1993

Ray Gardeski
Clough Harbour and Associates
3 Winners Circle
Albany, NY 12205

Dear Mr. Gardeski:

Thank you for inviting us to join your team for the Dover-Spaulding-Rochester project (11862), Exit 10-Spaulding Turnpike.

As requested, I have enclosed Victoria Bunker's resume, a company profile and a list of our recent highway projects. As you may note, Dr. Bunker's firm has completed archeological studies for other segments of the Spaulding Turnpike.

Please call if you have any question or need further information.

Sincerely,

Jane S. Potter

Jane S. Potter
for Victoria Bunker, PhD.

Enclosures

Victoria Bunker, PhD

Consultant in New England Archeology
and Cultural Resources Management

RR 1, Box 195E • Africa Road • Alton, NH 03809 • (603) 776-4306

RESUME

EDUCATION

Doctor of Philosophy: Boston University, 1983
Center for Materials Research in Archeology and Ethnology:
Massachusetts Institute of Technology, 1977-1980
Master of Arts: Tufts University, 1976
Bachelor of Arts: University of New Hampshire, 1974

PROFESSIONAL EXPERIENCE

ARCHEOLOGICAL CONSULTANT, CULTURAL RESOURCES MANAGEMENT
1981 - present
Operate woman-owned business to conduct cultural resources reviews and impact evaluations for archeological resources, conduct mitigation and determination of eligibility for projects in New Hampshire, Maine, Massachusetts and Vermont.

ARCHEOLOGICAL FIELD SUPERVISOR, TIMELINES INC.
1986-1987
Archeological field excavation and analysis of regional prehistoric sites including the Boylston Street Fishweir, Boston, involving recovery of water saturated remains at a coastal urban site.

PREHISTORIC SITES ARCHEOLOGIST, NEW HAMPSHIRE HISTORICAL SOCIETY AND HISTORIC PRESERVATION OFFICE
1982-1986
Directed research on prehistoric archeological sites for statewide survey and planning, developed research design, implemented field projects, trained volunteers and students in all aspects of field and laboratory analysis, conducted public education seminars, workshops and lectures.

NH COORDINATOR, BOSTON UNIVERSITY, QUEBEC HYDRO II, NEW ENGLAND POWER CO.
1985-1986
Directed field personnel, implemented research design, interpreted resources along 200 mile powerline corridor in New Hampshire.

STAFF ARCHEOLOGIST, NH WATER SUPPLY AND POLLUTION CONTROL COMMISSION
1979-1981
Cultural resources review and impact evaluation for waste water treatment projects in New Hampshire.

PUBLICATIONS

1988 Two Woodland Components in Litchfield, New Hampshire. The New Hampshire Archeologist 29(1).

1987 New Hampshire Coastal Sites Survey, Summer 1986. The New Hampshire Archeologist 28(1) (with Harrington).

Review of Orphanides: Radioanalytical Techniques in Archeology, Pottery and Raw Clay Analysis. Man in the Northeast 34.

Archeology of the Structural Form in New England. Conference on New England Archeology Newsletter 6(2).

1986 Middle Woodland Ceramic Patterning in the Merrimack River Valley. Archeology of Eastern North America 14.

1985 Prehistoric Pottery of the Garvins Falls Site. The New Hampshire Archeologist 26(1).

The Lund Collection: Nashua, NH. The New Hampshire Archeologist 26(1).

Prehistoric Pottery of the Smyth Site. Occasional Publications in Northeast Anthropology 9.

Pan Indianism in New Hampshire: The Case of Senate Bill 37. Conference on New England Archeology Newsletter 5(2).

1984 Prehistoric Site Location in the Merrimack Valley of New Hampshire. The New Hampshire Archeologist 25.

1983 Prehistoric Archeology in the Merrimack River Valley. Man in the Northeast 25.

Environmental Setting of Merrimack River Valley Prehistoric Sites. Man in the Northeast 25 (with McDowell).

The Smolt Site: Seasonal Occupation in the Merrimack Valley. The New Hampshire Archeologist 24 (1).

1982 Environmental and Archeological Site Location: A Multivariate Test, Merrimack River Valley, New England. American Quaternary Association (with McDowell).

Middle Woodland Pottery of the Central Merrimack Valley in New Hampshire. The New Hampshire Archeologist.

Chert and Crystal Quartz During the Late Archaic. The New Hampshire Archeologist.

Ancient Lifeways at the Smyth Site. The New Hampshire Archeologist (with Foster and Nicholas).

Prehistoric Pottery at the Smyth Site. The New Hampshire Archeologist.

1980 The Smyth Site (NH38-4): Research in Progress. The New Hampshire Archeologist (with Foster).

1979 A New Approach to the Analysis of New England Pottery. Man in the Northeast.

PROFESSIONAL AFFILIATIONS

1989-present	New Hampshire Rivers Management Advisory Council. Historic and archeological resources representative.
1982-present	Man in the Northeast. Regional editor.
1983-1985	Conference on New England Archeology. Steering committee member and newsletter editor.
1985	Eastern States Archeological Federation. NH representative.
1982-1984	New Hampshire Archeological Society. President.
1978-1982	New Hampshire Archeological Society. Executive Board of Directors.
	Society for American Archeology.
	Northeastern Anthropological Association.

TEACHING EXPERIENCE

1987-1988	Assistant Professor, Department of Archeology, Boston University.
1987	Adjunct Professor, Department of Anthropology, Franklin Pierce College-Concord.
1986	Adjunct Professor, Department of Anthropology, University of New Hampshire-Manchester.
1984	Instructor, Field School in Archeology, Keene State College.
1983-1984	Instructor, Field School in Archeology, Plymouth State College.
1982	Lecturer, Department of Anthropology, Franklin Pierce College.
1981	Graduate Assistant, Field School in Archeology, U-Mass, Boston.

Victoria Bunker, PhD

Consultant in New England Archeology
and Cultural Resources Management

RR 1, Box 195E • Africa Road • Alton, NH 03809 • (603) 776-4306

COMPANY PROFILE

Victoria Bunker, PhD, is the Principal Archeologist for the Company. The Company is a sole-proprietorship, woman-owned business, specializing in New England archeology and cultural resources management. Services include archeological research and survey including site survey and reconnaissance, site examination and data recovery for Environmental Assessments and Impact Statements. Personnel are available to complete National Register nominations for sites, individual properties and historic districts, preservation planning projects, architectural history and landscape history.

Victoria Bunker, PhD, and colleagues have worked throughout New England since the 1970s on a variety of impact assessment projects for such clients as US Fish and Wildlife Service, New England Power Company, Central Maine Power Company, Tennessee Gas Company, Boston University, U-Mass Amherst, NH Department of Transportation, NH Division of Environmental Services, and private individuals, local governments, and engineering firms throughout Maine, New Hampshire, Vermont, Massachusetts and Rhode Island. We maintain excellent working relationships with State Historic Preservation Offices throughout New England.

Victoria Bunker, PhD, has worked in New England archeology since the late 1970s. She has formal academic training at the University of New Hampshire, Tufts University, Massachusetts Institute of Technology and Boston University. She has held teaching positions in the University of New Hampshire system, Franklin Pierce College, Boston University and Phillips Exeter Academy and has worked as a Research Associate at the University of Maine, Orono. She has directed avocational training programs, presented papers at local historic societies and professional conferences and has published in such local and regional journals as The New Hampshire Archeologist, Conference on New England Archeology Newsletter, Man in the Northeast and Archeology of Eastern North America. She has served as editor for regional journals and newsletters, and is a member of professional archeological organizations. She has recently been appointed to the Governor's NH Rivers Management Advisory Commission to represent historic interests in developing protection plans for NH rivers.

QUALIFICATIONS SHEET
NEW HAMPSHIRE HIGHWAY PROJECTS

YEAR	PROJECT	CLIENT
1992	Conway, Route 16-302 Bypass	HMM
	F.E.Everett Turnpike	NH DOT
	Bedford, Route 101	NH DOT
	Manchester Airport Access	Normandeau Assoc.
	Dalton-Lunenburg Bridge	NH DOT
	Hanover-Norwich Bridge	NH DOT
	Haverhill-Bath Bridge	NH DOT
1991	F.E.Everett Turnpike, Exit 11	NH DOT
	Meredith, Route 25	Storch Assoc.
	Linden Street Bridge, Exeter	NH DOT
	Rochester, Spaulding Turnpike	VHB
	Newington-Dover Spaulding Tnpk	Normandeau Assoc.
1990	Manchester-Salem, I-93	NH DOT
	Exeter-Hampton, 101/51	Normandeau Assoc.
	Nashua-Hudson Circumferential	Deleuw Cather
	Concord-Laconia, Route 106	NE Environmental
	Windham-Salem, Route 111	NE Environmental
	Gilmanton Iron Works	NH DOT
	Oyster River Bridge	NH DOT
	Bath-Lisbon	Smart Assoc.
	Concord NW Corridor	Smart Assoc.
	Hillsborough, Route 9	Smart Assoc.
1989	Concord-Spaulding, I-393	Sverdrup & Parcel
	Manchester-Bedford, I-293	NH DOT
	Milford-Nashua, Rte 101A ByPass	Maguire Group
1988	Nelson-Stoddard, Route 9	NH DOT
	Dublin-Harrisville, Route 101	NH DOT
1986	Conway, Route 16-302 ByPass	Normandeau Assoc.
	Effingham-Freedom, Route 25	NH DOT
	Cross Mills Bridge	NH DOT
	Nashua Expressway	Boston Affiliates
1982	Hillsborough, Route 202 Bridge	NH DOT

PRESERVATION COMPANY

RECEIVED
AUG 12 1993
CLOUGH, HARBOUR
& ASSOCIATES

10 August 1993

Ray Gardeski
Clough Harbour
III Winner Circle
P.O. Box 5269
Albany, NY 12205

Dear Ray:

Thank you for including us on your team for the Spaulding Turnpike, Exit 10 project. As our project list explains, we have been involved with the Spaulding Turnpike before at the Newington-Dover crossing and on the East-West Highway (Concord-Spaulding Turnpike project). Over the years our experience in the area has been extensive. We prepared the historic resources chapter of the Dover Master Plan, the Cultural Resources Survey and Historic District ordinance for the city of Somersworth, and nominated the Rochester Commercial/Industrial Historic District to the National Register of Historic Places. This familiarity with the Strafford County area should be helpful with the evaluation of the specific resources on this project.

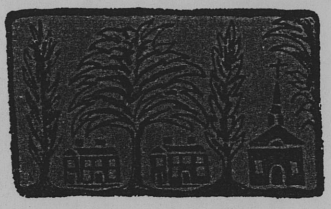
Please let me know if we can provide you with additional information.

Sincerely,

Lynne Emerson Monroe

LEM:tjh
encl.

Sunny Knoll
5 Hobbs Road
Kensington, N.H. 03833
603-778-1799



REPRESENTATIVE ENVIRONMENTAL REVIEW FOR TRANSPORTATION PROJECTS:

For each of these projects, Preservation Company prepared constraints maps and interim reports; resource evaluations and analyses of impacts; and compliance with 106 and 4(f) regulations for the Environmental Impact Statement. Prepared according to standards specified by a joint committee of FHWA, NHDOT and NHSHPO.

Route 393: Concord-Spaulding, NHDOT Project #10428

CLIENT: SVERDRUP Corporation - Donald Graham - 617/482-7880
38 Chauncy Street
Boston, MA 02111
The large project covers an area of 30 X 15 miles in the south/central area of the state between the cities of Concord and Portsmouth. The main route, NH Route 4, was historically the first New Hampshire turnpike. The area contains a variety of significant resources from prehistoric occupation to the present, offering unique opportunities for comparison. The detailed study of the upgrade of Route 4, the First New Hampshire Turnpike, was reviewed in the winter of 1992. Determinations of National Register Eligibility were produced for the entire project area, three towns, eight historic districts, and approximately 350 individual buildings.

Boston-Portland Railroad Passenger Study

CLIENT: Vanasse Hangen Brustlin, Inc. - Dr. Lisa Standley - 617/924 1770
101 Walnut Street
P.O. Box 9151
Watertown, MA 02272
The project involved preparing an area form for the entire railroad corridor in New Hampshire, and evaluating the significance of the Western Division of the Boston & Maine, including both rural and urban railroad facilities.

Route 101A: Milford-Nashua, NHDOT Project #F-010-1(24), 10136

CLIENT: Maguire Group Inc. - James Ryan - 617/890-0100
225 Foxborough Boulevard
Foxborough, MA 02035
Project area included approximately 100 square miles in the Merrimack Valley region and the Pennichuck water system. Determinations of National Register Eligibility were produced for fifteen historic districts, including the Nashua Municipal Airport, and approximately one hundred individual buildings.

Nashua-Hudson Circumferential Highway

CLIENT: Parsons De Leuw, Inc. - Bob DeSanto - 203/282-4400
290 Roberts Street
E. Hartford, CT 06118
Preservation Company was hired to conduct an intensive survey and complete the evaluation of historic resources. Determinations of National Register Eligibility were produced for four towns, seven historic districts, including the Pennichuck Water Works and Benson's Wild Animal Farm, and approximately one hundred individual buildings.

REPRESENTATIVE PROJECTS: (continued)

Terminal Relocation, Manchester Airport
CLIENT: Hoyle, Tanner & Associates, Inc. - Karen J. Frink - 603/669-5555
Five Commerce Park North
Bedford, NH 03102
The study involved preparation of the context for the evolution of aviation in New Hampshire and will be used to evaluate airport resources for future planning and compliance. Determinations of National Register Eligibility were produced for approximately sixty-five buildings at the airport and one historic district.

Route 16 Bypass: Conway, NHDOT Project #10339 (Phase I)
CLIENT: Normandeau Associates, Inc. - William Barry - 603/472-5191
25 Nashua Road
Bedford, NH 03102
Project area covered twenty miles surrounding the sensitive intervale of the Saco River between the towns of Albany and Bartlett. The reconnaissance study revealed the possibility of numerous prehistoric sites and hundreds of historic properties potentially eligible for the National Register of Historic Places.

Route 16 Bypass: Conway, NHDOT Project #11339 (Phase II)
CLIENT: HMM ASSOCIATES, INC. - Bob Klimm - 603/ 647-1010
Three Executive Park Drive
Bedford, NH 03102
This project involved an intensive level study of historic resources to assess National Register eligibility. Determinations of National Register Eligibility were produced for approximately 250 individual buildings and four historic districts.

NH Routes 101/51: Epping-Hampton, NHDOT Project #11324
CLIENT: Normandeau Associates, Inc. - Craig Wood - 603/472-5191
25 Nashua Road
Bedford, NH 03102
Project area spans the fifteen mile stretch of NH Route 101/51 between Hampton center and the Raymond border. Determinations of National Register Eligibility were produced for the overall project, seven towns, three historic districts, and approximately seventy-five individual buildings. The area is particularly sensitive because it involves significant resources from prehistoric occupation and the earliest period of European settlement. Ability to meet deadlines was of particular importance on this controversial project. The project's major success was achieved through an unusual compromise mitigation in the purchase of the historic 18th century Conner farm that also preserved significant wetlands and habitat.

Route 302: Bath-Lisbon, NHDOT Project #10425
CLIENT: The Smart Associates, Inc. - Doug Woodward - 203/224-7550
72 North Main Street
Concord, NH 03301
The project area involves historic Route 302 in the Ammonoosuc River Valley including the sensitive village centers of Upper and Lower Bath, and Lisbon. Determinations of National Register Eligibility were produced for three towns, eight historic districts, and approximately 150 individual buildings.

REPRESENTATIVE PROJECTS: (continued)

Route 111: Windham-Salem, NHDOT Project #F-038-1 (5) 10075
CLIENT: New England Environmental Associates, Inc. - Peter Schauer - 603/224-4773
P.O. Box 2394
Concord, NH 03302
Project area involved a historic route through the towns of Windham and Salem in the western part of Rockingham County. Determinations of National Register Eligibility were produced for two towns, four historic districts and approximately ninety individual buildings. Searles Castle is of particular interest to architectural historians.

Route 106: Concord-Laconia, NHDOT Project #RS-212 (4), 10672
CLIENT: New England Environmental Associates, Inc. - Peter Schauer - 603/224-4773
P.O. Box 2394
Concord, NH 03302
The study area is confined to the upgrade of NH Route 106, which passes through the historic village centers of Belmont, Loudon and residential neighborhoods in the city of Laconia. Determinations of National Register Eligibility were produced for six towns, nine historic districts and over two hundred individual buildings.

Quebec-Hydro II powerline corridor, New Hampshire section.
CLIENT: New England Power Company, Sub-Consultants to Boston University School of Public Archeology
The project concentrated on a 200 mile corridor from the town of Monroe on the Vermont border in the north to the town of Pelham on the Massachusetts border in the south. Studying the cross-section which ran the length of the state offered a unique opportunity to understand and compare a cross-section of resources from the Connecticut River valley at the north to the Merrimack Valley in the south.

Spaulding Turnpike: Newington-Dover, NHDOT Project #11238
CLIENT: Normandeau Associates, Inc. - Lee Carboneau - 603/472-5191
25 Nashua Road
Bedford, NH 03102
The project involves the upgrade of the crossing from Newington to Dover at Dover Point. This location is the site of known prehistoric activity and the first attempt at settlement in New Hampshire. Determinations of National Register Eligibility were produced for approximately the overall project, two towns, and approximately thirty individual buildings.

ENVIRONMENTAL REVIEW STUDIES

Nashua-Hudson Circumferential Highway
Manchester Airport, Terminal Relocation
Airport Access Study, Manchester, NH
Hydro-Quebec Powerline Corridor, NH
Route 16 By-Pass: Conway
Route 16 By-Pass: Conway, Phase II
NH Routes 101/51: Epping-Hampton
Route 101A By-Pass: Milford-Nashua
Route 106: Concord-Laconia
Route 111: Windham-Salem
Route 393: Concord-Spaulding Turnpike
Route 302: Bath-Lisbon
Spaulding Turnipike: Newington-Dover
Second River Crossing, Nashua, NH
(sub for Boston Affiliates)
Bridge Relocation, Bristol, NH
Lower Village Historic District, Claremont, NH
Access Across Ashuelot River, Winchester, NH
Route 101 By-Pass, Dublin/Harrisville
(sub for Bunker)
Jug End Rural Historic District, Egremont, MA:
Historic Resources Study and EIR
(sub for Boston Affiliates)
Sewer Relocation, Quincy, Massachusetts

DETERMINATIONS OF NATIONAL REGISTER ELIGIBILITY for NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

Nashua Municipal Airport, Nashua, NH
The Jedediah Brown House, Raymond, NH
The Conner Tenant House, Exeter, NH
Depot Road Historic District, Rochester, NH
The Daniel Ladd House, Deerfield, NH
The Deacon Ebenezer Prescott House,
Raymond, NH
The Jedediah Brown House, Raymond, NH
The Alfred Roby House, Bedford, NH
The Bijolle House, Littleton, NH
East Jaffrey Historic District, Jaffrey, NH
Gilmanton Iron Works Historic District,
Gilmanton Iron Works, NH
Carroll Road Agricultural District, Whitefield,
NH
Union Street Neighborhood District, Whitefield
Glen Village District, Bartlett, NH

HISTORIC AMERICAN ENGINEERING SURVEY (HAER) DOCUMENTATION

Bridge No. 089/034 (Route 4 over the Mascoma
River), Caanan, NH
Bridge No. 091/030 (Blackwater Road over the
Mascoma River), Canaan, NH
Brown's Bridge, Raymond, NH
Route 108, Oyster River Bridge, Durham, NH
Main Street Bridge, Lancaster, NH
Branch River Bridge, Keene, NH

TAX CREDIT CERTIFICATIONS and NATIONAL REGISTER NOMINATIONS

The Amesbury Hat Factory (Video Tape),
Amesbury, MA - for Boston Affiliates
Hamilton Mill #6, Lowell, MA
205 Newbury Street, Boston, MA
The Jordan School, Lewiston, ME
The Jonathan Colcord House, Newfields, NH
The Green Street School, Somersworth, NH
The Hayes Homestead, Rochester, NH
The Richard Hayes House, Rochester, NH
The Hewitt House, Enfield, NH
The Luther Locke House, Nashua, NH
Millville School, Concord, NH
The Moses/Kent House, Exeter, NH
The Jacob Noyes Block, Suncook, NH
The William Parker Straw Mansion, Manchester,
NH
The Pembroke Mill, Suncook, NH
The Pinkham House, Rochester, NH
The Governor Prescott House, Epping, NH
The Chester Hotel, Atlantic City, NJ
The Electric Company, Atlantic City, NJ
The Emmanuel Apartments, Atlantic City, NJ
The Spruce Hotel, Atlantic City, NJ
The Adams Memorial Building, Derry, NH
The Major John Gilman House, Exeter, NH
The Greeley House, East Kingston, NH
(with Hiatt, RPC)
The Deacon Jabez & Samuel Lane House,
Stratham, NH (with Kuranda, RPC)
The Kennison Tavern, Stratham, NH
(with Kuranda, RPC)
The Sanborn Seminary, Kingston, NH
The H. Watson Academy, Epping, NH
(with Kuranda, RPC)

HISTORIC DISTRICT NOMINATIONS

Abenaki Indian Shop and Camp, Conway, NH
Exeter Downtown Historic District, Exeter, NH (with Bennett, RPC)
Durham Historic District, Durham, NH(with Hiatt, RPC)
Rochester Downtown Historic District, Rochester, NH (with Brevoort, RPC)
South Hampton Multiple Resources, South Hampton, NH

COMMUNITY PRESERVATION
HISTORIC RESOURCES SURVEYS AND COMMUNITY MASTER PLANS

Ashland, New Hampshire
Atkinson, New Hampshire
Chester, New Hampshire
Concord, New Hampshire
Derry, New Hampshire
Dover, New Hampshire
Greenland, New Hampshire
Hampstead, New Hampshire
Jaffrey, New Hampshire
Lee, New Hampshire
Newington, New Hampshire
Sanbornton, New Hampshire
South Hampton, New Hampshire

HISTORIC DISTRICT ORDINANCES, REGULATIONS & GUIDELINES

Chester, New Hampshire
Derry, New Hampshire
Dover, New Hampshire
Exeter, New Hampshire
Somersworth, New Hampshire

Resume: Lynne Emerson Monroe

EDUCATION

Bachelor of Fine Arts: University of Pennsylvania. 1971.
Advanced Studies in Historic Preservation: Boston University. 1979-1980.

PROFESSIONAL EXPERIENCE

PRESIDENT, PRESERVATION COMPANY
October 1983 - Present

Founded the consulting firm to offer a full range of planning services to public and private clients including developers, individual property owners, municipalities and state agencies. Preservation Company is a certified Minority/Woman-owned business. A listing of projects is included.

DIRECTOR, NEW HAMPSHIRE ASSOCIATION OF HISTORIC DISTRICT COMMISSIONS
April 1983 - 1985

Organized New Hampshire's 44 Historic District Commissions and formed the framework for their association. Wrote, received and administered N.P.S. grant, wrote By-Laws, Articles of Incorporation, 501c3 application, non-profit bulk mail application, etc. Organized quarterly meetings and workshops, and provided technical assistance to members. Wrote standards for New Hampshire's Certified Local Government program, and conducted statewide inventory of preservation activity in individual towns.

STRAFFORD-ROCKINGHAM REGIONAL COUNCIL (Re-organized as the Rockingham Planning Commission, June 1982)
DIRECTOR, HISTORIC PRESERVATION ASSISTANCE PROJECT
December 1978 - April 1980

Hired, trained and supervised staff of eight under an 18-month, $150,000 grant program. Administered grant, developed work program, and promoted the project to provide professional assistance in historic preservation for 43 cities and towns in the Seacoast Region of New Hampshire.

DIRECTOR, HISTORIC PRESERVATION PROGRAM
April 1980 - September 1983

Raised over $250,000 in grants and private dollars to expand on the work of the Assistance Project. Augmented efforts by hiring consultants and interns as available and training community volunteers. Developed, published and promoted methodologies for volunteer survey and planning efforts throughout the state. The Historic Preservation Program won the New Hampshire Planners Association's Award for Excellence and Creativity in Planning, 1983.

Resume: Lynne Emerson Monroe

PROJECTS LIST

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Resume: Lynne Emerson Monroe

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Sanbornton, New Hampshire
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HISTORIC DISTRICT ORDINANCES, REGULATIONS & GUIDELINES

Chester, New Hampshire
Derry, New Hampshire
Dover, New Hampshire
Exeter, New Hampshire
Somersworth, New Hampshire

PUBLICATIONS

PRESERVING COMMUNITY CHARACTER: Ways to Reconcile Change with the Character of a Place. (with Ray and Baldwin) 1988.
COMMON BOND: The Historic Preservation Newspaper for New Hampshire. Circulation: 5,500. 1984.
COMMON BOND: The Historic Preservation Newsletter of the Rockingham Planning Commission. Circulation: 600. 1981-1983.
The Cultural Resources Survey: A Citizen's Guide. June 1981.
Historic Preservation and Master Planning: A Manual for Local Officials. September 1982.
The First Stage Survey: A Model for Organization. April 1983.
Historic Districts in New Hampshire: A Manual for Practice. (with Baldwin et.al.) April 1980.
Historic Preservation: A Strategy for Revitalization in Rochester, New Hampshire. September 1982.

LECTURER

University of New Hampshire. March 1983; June 1981; February 1982; April 1983. Regular guest speaker for two classes, Fall and Spring 1985, 1986, 1987, 1988.
Franklin Pierce Law Center. 1980, 1981, 1982.
Boston University. June 1980.
Boston Architectural Center. June 1982; October 1983.
Participating Humanist and Lecturer for New Hampshire Council on the Humanities Projects: "Architectural Heritage Education," and "The Mill on Main Street."
Speaker, National Trust for Historic Preservation, Annual Conference, Baltimore, 1984, "Historic Districts in Small Towns," and 1988, "Master Planning in Small Towns."

PROFESSIONAL AFFILIATIONS

Treasurer, NATIONAL ALLIANCE OF PRESERVATION COMMISSIONS
Board of Directors, INHERIT NEW HAMPSHIRE
Steering Committee, Downtown Revitalization of Exeter, New Hampshire
Chairman, PRESERVATION NOW!
Board of Directors, ASSOCIATION OF HISTORICAL SOCIETIES OF NEW HAMPSHIRE
Board of Directors, Steering Committee, TASK FORCE ON HISTORIC PRESERVATION IN NEW HAMPSHIRE

Staff Biographic Data

ELIZABETH HOSTUTLER, Senior Historian, has a Master of Arts in Preservation Studies from Boston University, and a Bachelor of Arts in History, magna cum laude, from Gordon College in Massachusetts. She has worked on historic building surveys in New Hampshire, Maine and Massachusetts, evaluating historic resources as diverse as bridges, amusement parks, zoos, railroads, chicken farms and summer estates. She has worked with Preservation Company for two and one half years on eight major projects, writing townwide area forms and determinations of eligibility for individual building and structures and historic districts. In addition to her work with Preservation Company, Ms. Hostutler serves as President of Portsmouth Advocates, Inc., an all-volunteer citizens organization dedicated to preserving the unique historic heritage of Portsmouth, New Hampshire.

KARI ANN FEDERER, Senior Historian, has an Master of Arts in Preservation Studies from Boston University and a Bachelor of Arts in Anthropology with a concentration in archaeology from the University of Massachusetts at Amherst (Phi Beta Kappa, Phi Kappa Phi, Commonwealth Scholar). She has been a member of several historical archaeological excavation teams and worked with several historic museums including Historic Deerfield, Strawbery Banke Museum, and the Old York Historical Society. Ms. Federer has worked for Preservation Company for two and a half years, serving as senior historian on five major projects, directing fieldwork and historical research and preparing townwide area forms and determinations of eligibility for individual structures and historic districts. A resident of York, Maine, Ms. Federer has directed a townwide historic resources survey of Eliot, Maine, and is a member of the York Historic District Commission.

TERESA J. KIRKER HILL, Production and Computer Services Manager, has Bachelor of Science degree from Union College in Schenectady, New York, where she graduated magna cum laude. After graduate studies at the University of New Hampshire, she worked for several years with computers in various fields in New Hampshire and New York State, including teaching, programming, graphic design, and interior design, before coming to Preservation Company in 1989. In addition to working as a survey research assistant, Ms. Hill is a computer expert who designed the first computerized historic resources survey in the state of New Hampshire. These forms for determination of eligibility include both computerized individual and area forms, and information databases for each historic district and project area. She oversees all production for Preservation Company, including computerized forms, photography, and mapping. She also coordinates with engineering firms and the Department of Transportation on the production of maps for both agency reviews and public hearings.

RAYMOND J. RUMANOWSKI, P.E., PARTNER

Position

Project Manager

Education

Rensselaer Polytechnic Institute/B.S. in Civil Engineering/1973

Experience

Mr. Rumanowski joined Clough, Harbour & Associates in 1979 after five years of service with the New York State Department of Transportation.

Mr. Rumanowski has 20 years of engineering and management in environmental studies, design and construction of highways and facilities for state transportation departments. He has extensive experience in managing and designing complex engineering projects. He is also current on environmental regulations and processing and knowledgeable of U.S. Army Corps of Engineers regulations and permitting wetlands identification and mitigation, noise and air quality studies, flood plain regulations, Section 4(f)/106 documentation, as well as FHWA/NEPA processing. Mr. Rumanowski will be responsible for technical supervision of the project, preparation of plans and reports, budget and scheduling activities, and public participation activities.

Among his recent projects are:

- Interchange 8/I-90 connection to Route 4, North Greenbush, New York, environmental impact statement preparation. Mr. Rumanowski was involved in the highway design and document preparation of this project involving development and evaluation of a multi-directional interchange and arterial to provide access between I-90 and the local roadway network. Mr. Rumanowski assisted in the completion of this EIS with Section 4(f) statement. The project required the preliminary development and evaluation of seven separate "build" alternatives prior to selection of the preferred alternative. As a result of FHWA involvement, the report was prepared in strict conformance with FHWA Technical Advisory T6640.8A.

- I-90/I-87/Thruway Interchange 24, Albany, New York. Project manager for environmental studies and design for over $50 million of reconstruction including 18 new structures, reconfiguration of an existing cloverleaf interchange of I-87 and I-90 to a directional interchange, construction of a new 13 lane toll plaza, construction of new auxiliary lanes, and modifications to 5 existing interchanges. The project required 35 complicated construction sequencing stages to safely convey over 120,000 vehicles/day through the construction zones.

- o I-890/Thruway Interchange 26 and Mohawk River Bridge Crossing, Towns of Rotterdam & Glenville, New York. Project manager for environmental studies and design for a new river crossing which would relieve congestion on Mohawk River Bridges in Schenectady and in the Village of Scotia. The planned $40 million construction involves a new 700 foot river span and two new trumpet interchanges. Extensive environmental studies and EIS preparation are required. A fast track schedule is required to achieve maximum federal funding.

- o I-190/Niagara Thruway, Buffalo, New York. Project director for total reconstruction of 2.8 miles of the Niagara Thruway including replacement and rehabilitation of 6 bridges (design phases V-VI). Elaborate construction sequencing was developed to allow reconstruction of the travel lanes under traffic. Estimated construction cost is $25 million.

- o Constructability Review for the NYS Thruway Suffern Interchange. Project engineer responsible for the constructability review of construction sequencing/maintenance and protection of traffic for this $130 million reconstruction project.

- o Route 74, Severance to Paradox, Essex County, New York. Project manager/project engineer for environmental studies and design for the realignment of 5.5 miles of state highway in the Adirondack Park.

- o Bennington Bypass, Bennington, Vermont. Project manager for the final design of 3.8 miles of bypass roadway connecting NY Route 7 and US Route 7 north and west of Bennington, Vermont. Project value - $20 million.

- o Chittenden County Circumferential Highway; Section 2, Preliminary and Final Design. Mr. Rumanowski was involved in supervision, direction and coordination of CHA staff, as well as client liaison with the Agency and various other consultants, agencies and contractors. The project involved complex designs for soil stabilization and consolidation, multiple span structures, a multi-directional interchange and sequenced construction.

Professional Registration and Activities

Registered Professional Engineer in the States of New Hampshire, Connecticut, New York, Vermont, Massachusetts, Maine, Pennsylvania, Rhode Island, and Florida

Institute of Transportation Engineers

RAYMOND M. GARDESKI, P.E., PARTNER

Position

Principal-in-Charge

Education

Pennsylvania State University/M.C.E./1970
Union College, Schenectady, New York/B.C.E./1962
Orange County Community College, Middletown, New York/A.A.S./1960

Experience

Mr. Gardeski is responsible for the management of the Transportation Division overseeing a staff of approximately 50. Primary transportation engineering services are transportation, environmental impact assessments, highway design, structure inspection and design, traffic studies and design, airport planning and design, railway studies and design, and construction liaison/shop drawing review. His experience has included the supervision of preliminary and final design for numerous highway/bridge projects and traffic engineering studies and design for both state and local transportation agencies.

Prior to joining Clough, Harbour & Associates, Mr. Gardeski was the Chief Operational Officer for the firm of Century Engineering, a 175- person multi-discipline consulting engineering firm located near Baltimore, Maryland. In addition to his corporate management responsibilities, he served as the firm's Chief Transportation/Traffic Engineer. He also worked for the New York State Department of Transportation for 27 years, serving in various highway design and traffic engineering positions. He has held positions of Project Engineer-Highway Design, Region 8, Regional Traffic Engineer, Region 8, Regional Design Engineer, Region 1 and Director, Traffic and Safety Division.

Mr. Gardeski has extensive experience in preliminary design and environmental impact document preparation for transportation facilities having been involved with numerous highway projects in environmentally sensitive areas while in charge of transportation design for the NYSDOT. He is acutely aware of the issues involved in constructing a highway in a pristine, mountainous environment and successfully developed many citizen participation programs for controversial projects. He has conducted numerous public information meetings and public hearings. His experience in both traffic engineering and highway design affords him the ability to balance the projects transportation needs with environmental and local citizen concerns.

RAYMOND M. GARDESKI, P.E., PARTNER

Mr. Gardeski served as design engineer and manager for reconstruction of the interchange between I-90 and I-87 and the New York State Thruway in Albany County, New York. The project involved preparation of an environmental impact statement, public hearings, and final design, for the major rebuilding of a high volume interchange and required extensive maintenance of traffic sequencing and a transportation systems management plan. Design of the new interchange included changing of loop ramps to direct connections, construction of new ramps, twenty highway structures, and major expansion of the toll plaza at the New York State Thruway.

Mr. Gardeski supervised and managed the design and environmental studies for the reconstruction of a 5.5 mile section of the Rte. 74 in the Adirondack Park of New York State. This project traversed some of the most scenic mountainous terrain in the State running adjacent to both Paradox Lake and Eagle Lake. This project required extensive involvement with environmental protection groups, camp owners association, logging industry, and regulatory agencies. Areas of environmental concern were visual impacts, wildlife habitat, water and air quality, wetlands, ecological, stormwater management and sedimentation/erosion control.

Mr. Gardeski supervised and managed the design of a 3.5-mile urban- controlled access facility, Alternate Route 7, in Albany County, New York. The project involved preparation of the environmental impact statement, extensive community participation, preliminary and final highway and bridge design, and construction liaison. This $50 million expressway project required innovative environmental abatement techniques at adjacent schools and neighborhoods. Construction at existing major interstate routes (I-787, I-87) required extensive traffic management during construction.

Mr. Gardeski was design engineer and manager for the design of a four- lane, rural interstate route, I-88, in Schenectady County, New York. This project involved an environmental impact statement, preliminary and final design, and construction liaison. The alignment was selected and designed to complement existing land forms and optimize the natural scenic vistas. A major interchange was designed involving highway relocations, railroad/highway grade separations, and a major toll plaza of the New York State Thruway.

Mr. Gardeski was design engineer and manager for reconstruction of additional lanes in the median of the New York State Thruway from the I-88 interchange in Schenectady County, New York to I-90, Exit 24 interchange in Albany County, New York. This project involved environmental document preparation, wetland mitigation, noise abatement studies, stormwater management and sedimentation/erosion control, preliminary and final design, transportation system management, and maintenance of traffic during construction.

RAYMOND M. GARDESKI, P.E., PARTNER

Mr. Gardeski served as Principal-in-Charge for I-93 NB & SB over Stonehenge Road, Londonderry, New Hampshire for the New Hampshire Dept. of Transportation. This project involved structural design for the replacement of two parallel I-93 structures over Stonehenge Road in Londonderry, New Hampshire. The replacement structures consist of precast, prestressed concrete I-beams on tall abutments with spread footings. The design required the provisions be made for anticipated future widening, as well as the need to maintain full traffic at all times.

Mr. Gardeski serves on a number of national highway and traffic engineering research panels involving traffic engineering during construction and highway design standards as they impact highway safety.

Professional Registration and Activities

Registered Professional Engineer in the States of Vermont, New Hampshire, New York, Connecticut, Maine, Pennsylvania, California, Maryland, Delaware, North Carolina, Kentucky and Massachusetts.

Member, American Society of Civil Engineers
Member, American Society of Highway Engineers
Member, National Society of Professional Engineers
Fellow, Institute of Transportation Engineers
Chairman, NCHRP Project Panel 341, Procedure for Determining Work Zone Speed Limits
Member, NCHRP Project Panel G17-9, Effect of Highway Standards and Safety

8/26/93

ROGER T. MONSELL, PLS

CHA

Position

Senior Project Land Surveyor

Education

Middlesex County College/Civil Engineering/1974
Rutgers University/1967
Union College/Engineering Science/1966

Experience

Mr. Monsell has acquired a broad range of managerial and technical experience. He has served as a Corporate Regional Manager, Vice President and Project Manager and Project Surveyor. Some of the highlights in his experience include:

- Baystate Medical Center, Springfield, Massachusetts. Project Principal for detailed topographic and utility survey of this 30 acre site.

- Town of Washington, New Hampshire. Project Principal for preliminary right-of-way and engineering surveys for 1.5 mile rural access highway to a lakefront community.

- U.S. Park Service, Martinsburg, West Virginia. Principal-in-Charge for corridor surveys of Appalachian Trail, Rutland to White River, Vermont.

- Tenneco, Inc., Boston, Massachusetts. Project Principal for Maine to Pennsylvania gas transmission line (Mass and NH section) surveys and title for right-of-way.

- Vanasse Hangen, Boston, Massachusetts. Project Principal for field survey and redesign of approximately 5000 linear feet of downtown streets and intersections in Springfield, Massachusetts.

- Fluor-Daniels, Inc., Houston, Texas. Project Principal for Global Positioning System (GPS) control for 175-mile underground transmission line through Vermont, New Hampshire and Massachusetts.

- Vanesse Hangen Brustlin, Bedford, New Hampshire. Project Surveyor for preliminary surveys of proposed 140,000 square foot commercial development in Hinsdale, New Hampshire.

- U.S. Park Service, Boston, Massachusetts. Principal Surveyor for the preparation of topographical surveys and acquisition plans for 15 miles of canalways in Lowell, Massachusetts.

- Town of Erving, Massachusetts. Project Principal for Erving highway layouts and monumentation.

- Massachusetts Dept. of Public Works, Boston, Massachusetts. Project Principal for highway surveys for an open-end contract for Districts 1 and 2.

- Seafield Pines Hospital, Keene, New Hampshire. Project Surveyor for property and topographic surveys, construction layout and mapping of 450 unit second home community.

- Historical Society of Cheshire County, Keene, New Hampshire. Land Surveyor responsible for boundary and topographical surveys for Wyman Tavern historical site.

Professional Registration and Activities

Registered Professional Land Surveyor in the States of New York, New Hampshire, Massachusetts, New Jersey and Vermont
Licensed Professional Planner in the State of New Jersey

Member of:

New Hampshire Land Surveyors Associates
American Congress on Surveying and Mapping
National Society of Professional Surveyors
Massachusetts Association of Land Surveyors and Civil Engineers
Connecticut Valley Association of Civil Engineers and Land Surveyors Vermont Society of Surveyors
New Jersey Society of Professional Planners
Planning Board, Chesterfield, New Hampshire
Planning Board Chairman, Chesterfield, New Hampshire
Southwest New Hampshire Regional Planning Commissioner and Board of Directors
Urban Land Institute
American Planning Association
Monadnock Regional Highway Advisory Commission, Chesterfield Lake, Spofford
New Hampshire Association Board of Directors, President

PETER M. CONWAY, R.L.A., ASLA

Position

Senior Project Environmental Planner & Landscape Architect

Education

Cornell University/B.S. Landscape Architecture/1976
State University of New York at Cobleskill/A.A.S./1973

Continuing Education:

Rensselaer Polytechnic Institute/M.S. in Urban and Environmental Studies
SEQR Expert Seminar, 1987, New York Land Institute
Dun & Bradstreet, 1989, Management Seminar
Management Continuing Education Courses, 1987, Rensselaer Polytechnic Institute
Project Management Seminar, 1989, Professional Services Management (PSMJ)
Golf Course Design, 1991, Harvard University, Geoffrey S. Cornish,
Robert Muir Graves

Experience

Mr. Conway has over 10 years experience in transportation/highway planning with concentrations visual analysis, environmental impact statements, permitting, wetland mitigation and landscape architectural design. He is directly responsible for the overall management of environmental planning and landscape architectural services for the firm.

Mr. Conway's involvement in transportation/highway planning includes clients such as the New York State Department of Transportation, New York State Thruway Authority, Connecticut Department of Public Works, Connecticut Department of Transportation, and Vermont Agency of Transportation.

Mr. Conway's most recent transportation related projects include:

- Visual analysis, wetland delineation and environmental impact analysis for New York State Rt. 24 to Paradax Lane. This 10 mile stretch of highway was located in the heart of the Adirondack Mountains and had a construction value of $20 million.

- Visual analysis, flood plain study, and environmental impact analysis for the New York State Corning bypass. This 15 mile length of highway involved two municipalities and had a construction value of $110 million.

- Preparation of an environmental impact statement for the I-90/I-87 interchange at Exit 24 of the New York State Thruway. This project was located in the environmentally sensitive Pine Bush Barrens of Upstate New York. The project was under construction for 5 years and has a construction value of $40 million.

- Preparation of wetland delineation and mitigation for Route 7 in Norwalk, Connecticut. Responsibilities working for the Connecticut Department of Transportation included the delineation, classification, and protection of wetlands contiguous to the Norwalk and Silvermine rivers. The projects also included the recreation of 20 acres of new wetlands.

Mr. Conway's most recent landscape architectural projects of note include the site design in support of Robert A.M. Stern Architects for the Normal Rockwell Museum in Stockbridge, Massachusetts, and landscape site development for the Olympic Training Center in Lake Placid, New York, and selection by New York State Office of General Services for wetland delineation throughout the state of New York under a multi-year term agreement.

Professional Registration and Activities

Registered Landscape Architect in the States of New York, Connecticut, Maine, Massachusetts and North Carolina

Member of:

American Society of Landscape Architects (ASLA)
Building and Zoning Board of Appeals, City of Albany, New York
American Planning Association

THOMAS P. KARIS, P.E.

Position

Senior Project Highway Engineer

Education

Clarkson University, Potsdam, New York
Bachelor of Science, Civil & Environmental Engineering, May 1986

Experience

Since joining Clough, Harbour & Associates in 1986, Mr. Karis has progressed through the ranks of engineer, project engineer, and project manager. Mr. Karis is responsible for the supervision of a staff of engineers and technical support personnel in the Transportation Division, project management of specific projects, and client interaction for transportation facility projects. Mr. Karis provides a diversified background in transportation facilities studies and design which include the following:

- Interchange 8/I-90 connection to Route 4 environmental impact statement preparation (NYSDOT). As project manager, Mr. Karis was responsible for the highway design and document preparation of this project involving development and evaluation of a multi-directional interchange and arterial to provide access between I-90 and the local roadway network. Mr. Karis actively participated in the investigative studies and coordinated the multi-disciplinary efforts of support staff, contributing to the completion of this EIS with Section 4(f) statement. The project required the preliminary development and evaluation of seven separate "build" alternatives prior to selection of the preferred alternative. As a result of FHWA involvement, the report was prepared in strict conformance with FHWA Technical Advisory T6640.8A.

- Chittenden County Circumferential Highway; Section 2, Preliminary and Final Design (VAOT). As project engineer/project manager of this multiple contract project in northern Vermont, Mr. Karis was initially involved as a project engineer. As the project duration lengthened, Mr. Karis' involvement expanded to project manager responsible for supervision, direction and coordination of CHA staff, as well as client liaison with the Agency and various other consultants, agencies and contractors. The project involved complex designs for soil stabilization and consolidation, multiple span structures, a multi-directional interchange and sequenced construction.

- Route 12F Interchange at I-81 environmental assessment and final design preparation (NYSDOT). As project manager/section manager, Mr. Karis directed the efforts of the transportation staff, support staff, and subconsultant working on this project. The project involved a diamond type interchange bridge replacement with ramp and approach reconstruction. The environmental assessment included a hazardous materials assessment with a bridge rehabilitation project report to evaluate two separate "build" alternatives which involved replacement versus rehabilitation.

- Route 442 from Route 9 to Route 22 environmental assessment and final design preparation (NYSDOT). As project manager/section manager, Mr. Karis directed the efforts of the transportation staff, support staff and subconsultants working on this project. The project involved the reconstruction of 4.0 miles of rural roadway with bridge rehabilitations. The environmental assessment addressed agricultural districts, Section 4(f) properties, wetlands and hazardous materials as areas of particular concern. The report evaluated two "build" scenarios which involved pavement rehabilitation versus full depth pavement reconstruction with geometric improvements.

- Schoolhouse Road from US Route 20 to McKown Road environmental assessment and final design preparation (ACDPW). As project manager/section manager, Mr. Karis directed the efforts of the transportation staff and support staff working on this project. The project involves the widening/reconstruction of approximately 0.75 miles of roadway with bridge replacement on adjacent alignment. The project included preparation of the project justification report and evaluation of various lane configuration alternatives in the environmental assessment.

- I-287/NYS Thruway/Route 17 Suffern Interchange constructability review (NYSDOT). As project manager, Mr. Karis coordinated and prepared the "fast track" constructability review of this project to ensure that the contract documents are sufficiently detailed so that the project can be bid rationally and built without significant contract change. The primary areas of review focused on maintenance and protection of traffic during construction, critical path construction scheduling, major utility relocations, railroad operations and track outages, staging and removal and remediation of contaminated soil and hazardous waste, staging of structural foundation construction, steel erection, and overall project accessibility.

Mr. Karis' final design experience covers a wide variety of projects for a client base ranging from private developers to State agencies as follows:

Vermont Agency of Transportation:

- Reconstruction of Vermont Route 116, Bristol, Vermont.
- Pavement Management Account Projects, Franklin and Orleans Counties, Vermont

New York State Department of Transportation:

- Replacement of Ayrault Road over the Barge Canal, Monroe County.
- Replacement of County Road 7 Bridge over the Moodenerkill Creek, Rensselaer County.
- Rehabilitation of Route 9 Bridge over the Ausable River, Clinton/ Essex County.
- Replacement of Route 9N over the Bartlett Brook, Essex County.

Municipalities:

- Reconstruction of Crescent Road (C.R. 92), Saratoga County, New York.
- Intersection Improvement at Moe Road and Crescent Road, Clifton Park, New York.
- Roadway Improvements to Louden Road, Wilton, New York.
- Reconstruction of Pawling Avenue, Troy, New York.
- Reconstruction of Schoolhouse Road, Albany, New York.

Private Development:

- Roadway Improvement to Columbia Turnpike, Rensselaer, New York.
- Roadway and Intersection Improvements to 126th Street, Troy, New York.
- Intersection Improvements to Middle Settlement Road, New Hartford, New York.
- Roadway and Intersection Improvements to Sand Creek Road at Wolf Road, Colonie, New York.
- Roadway Improvements to NYS Route 5A and Henderson Street, New Hartford, New York.

Professional Registration and Activities

Registered Professional Engineer in the States of New York, Vermont, Connecticut, New Hampshire, Massachusetts, Pennsylvania and Maine

Associate Member of American Society of Civil Engineers

PETER FAITH, P.E., PARTNER

Position

Senior Project Traffic Engineer

Education

Manhattan College/M.S. in Civil Engineering/1984
Pennsylvania State University/B.S. Transportation Engineering/1978
State University of New York at Delhi/A.A.S. in Civil Technology/1976

Continuing Education

Traffic Signal Design, Institute of Transportation Engineers, National Highway Institute, 1985
Highway Capacity Manual, Overview and Signalized Intersections, Institute of Transportation Engineers, 1986
Dale Carnegie Course in Effective Speaking and Human Relations, 1989
Leadership Saratoga, Saratoga Co. Chamber of Commerce, Class of 1992

Experience

Mr. Faith is responsible for the management of the Transportation Planning and Traffic Engineering Section within CHA's Transportation Service Group. He has experience in traffic analyses, transportation forecasting, transportation planning and design, including preparation of design plans, specifications and estimates for highway systems improvements.

The following is a partial listing of assignments and management responsibilities with CHA:

- Mr. Faith has worked extensively with numerous town and county officials to provide traffic engineering services on an on-call basis to review traffic impacts of proposed developments, and recommending traffic improvements and additional traffic control required by development projects. Mr. Faith has worked closely with Town Planning Boards, Zoning Boards, the NYSDOT, and other traffic consultants to determine appropriate methods to evaluate traffic impacts of development projects.

- Mr. Faith was the Project Manager for the Exit 26/Interstate 890 transportation study in Schenectady, New York. This study focussed on the evaluation of existing and future transportation needs along the corridors paralleling the Mohawk River and included study of a new bridge over the Mohawk River connecting to the New York State Thruway. He directed a full-scale origin/destination study as part of the project and incorporated the T-Model system in projecting future traffic volumes and levels of service.

- Mr. Faith directed the traffic impact analysis for the proposed Gleneagle Resort Complex, a development comprising 900 acres in the Adirondack Region in Lake Placid, New York. This study included a comprehensive analysis for the traffic corridors within the Village of Lake Placid and developed recommendations for required transportation improvements.

- Using the T-Model system as applicable, Mr. Faith has served as Project Manager for the transportation study performed as part of the environmental impact statement analyzing short-, intermediate, and long-term impacts and required improvements for major corridors and study areas in the Capital District area of New York State. These have included the 4,500-acre subregion for the Boght Road/ Columbia Street area in Colonie, the 8,500-acre subregion in Albany County with a focus on the Albany County Airport area and the Wolf Road commercial/retail corridor.

- Project Manager for determining the traffic impacts due to the construction of the Knickerbocker Arena in downtown Albany, New York with recommendations and cost estimates for numerous systems improvements within the immediate urban area. Mr. Faith has directed numerous projects involving the traffic impact analysis of large land development, such as regional shopping centers, office parks, etc., including supervision of field surveys, collecting traffic parking data, traffic projections, traffic analysis, site access designs, parking demand and analysis, and traffic signal design and design of intersection improvements.

- As Project Manager for the Krumkill area traffic study, conducted for the Albany County Department of Public Works, he was responsible for evaluating the capacity and safety needs of numerous roadways within the Krumkill area using microcomputer transportation models. The study analyzed the effectiveness of low-cost transportation systems management improvements and construction of new bypass roadways to accommodate projected traffic demands due to forecasted development of between 2,000 and 6,000 new residential dwelling units. Environmental concerns were a major consideration due to the unique rural and scenic setting of this study area.

- Mr. Faith is currently the Project Manager for the transportation study of a ten-mile long by one-mile wide transportation corridor in the Vestal/Endicott area just west of Binghamton, New York. This study includes the evaluation of alternative land uses, existing traffic analysis to forecast the future traffic, the development of bypass alternatives and the assessment of new crossings over the Susquehanna River. Environmental issues are a major focus in this study due to the amount of development along the corridor and the scenic, wetlands and flood plain issues within the scenic Susquehanna River Valley.

Professional Registration and Activities

Registered Professional Engineer in the States of Connecticut, New York, Vermont, New Hampshire, Pennsylvania and Maine
Member, Institute of Transportation Engineers

MARK W. OLSTAD, P.E., ASSOCIATE

CHA

Position

Senior Project Structural Engineer

Education

Rensselaer Polytechnic Institute, Troy, New York/B.S.C.E./1978

Continuing Education:

Attended NYSDOT Bridge Inspectors Training Seminar
Attended NYSDOT Special Inspection of Two and Three Girder Welded Bridge Superstructures Seminar
Attended Course on Inspecting, Rating & Upgrading Bridges at George Washington University

Experience

Since 1984, Mr. Olstad has been responsible for the management of the Bridge Section, whose primary services include bridges, locks, dams and other transportation related structural design, inspection and rehabilitation. As Operations Manager, Mr. Olstad has been directly involved with the following projects and has reviewed all plans, specifications, and estimates for constructability, adherence to design standards, technical aspects, and quality control:

o NYS Thruway Authority - Rehabilitation of 6 Bridges

Supervised the inspection, analysis, load rating, preparation of reports, and preparation of plans, specifications and estimates for the rehabilitation of 6 bridges on the Niagara section of the NYS Thruway over local streets. These bridges are part of a 2.8 mile section of roadway planned for reconstruction. Since this roadway is a major arterial carrying traffic to and from downtown Buffalo, maintenance and protection of traffic was critical on this project. Therefore, staged construction will be required and traffic will be maintained on half of each bridge while the adjacent half is being reconstructed.

o NYSDOT Bridge Replacement - Route 15A over NYS Thruway

Supervised the design and preparation of contract plans, specifications and estimates for the replacement of this bridge. The existing horizontal alignment was used and the vertical profile was raised. A project requirement was to maintain traffic on site at all times which necessitated staged construction. Temporary H-pile and lagging walls were designed to allow for excavation and construction of the new abutments while traffic was maintained close by. Special provisions were developed for removal and disposal of asbestos conduit embedded in the sidewalk slab of the existing bridge.

This structure is a two span, continuous, steel stringer bridge with haunched stringers at the center pier. The bridge is approximately 300 feet long and 46 feet wide.

o VAOT Bridge Design

Supervised the design and preparation of contract plans, specifications and estimates for the construction of 9 new bridges and 6 new culverts for the Chittenden County Circumferential Highway (VT Rt. 289). Four bridges crossed the Central Vermont RR (CVRR) and required coordination with CVRR to provide proper clearances. Site constraints required the design of temporary support of the RR embankment during excavation and driving of piles for a pier located close to the tracks. A five foot diameter pipe culvert was designed to be jacked under the CVRR. The other bridges that were designed carried or crossed other state routes or local roads and all were associated with an interchange at each location.

o NYSDOT - Rehabilitation of Rt. 9 over Ausable River

Supervised the inspection, analysis, load rating preparation of design report and preparation of contract plans, specifications and estimates for the rehabilitation of this bridge. The existing structure is a 3-pin steel arch, 232 feet long, with flanking concrete arch spans on the approaches. Two travel lanes and two pedestrian sidewalks are carried on the bridge. The possible detour routes for this project were deemed to be unacceptable, and therefore, traffic was maintained on one lane of the bridge and rehabilitation was planned to be performed in stages.

o Other Bridge Design and Rehabilitation Projects

Supervised the evaluation, design and preparation of contract plans, specifications and estimates for numerous bridge replacement and rehabilitation projects for such client as NYSDOT, VAOT and many New York Towns and Counties. Types of structures include steel stringers, prestressed concrete and timber prefabricated trusses. Size of structures range from short (25 foot) single span to 300 foot multi-span, continuous bridges, carrying a minimum of 2-10 foot lanes to 4-12 foot lanes and 8 foot shoulders.

o Bridge Inspection Programs

Supervised the field and office staff for inspection projects for both the NYS Thruway Authority and NYSDOT. Under these projects over 300 Thruway bridges have received biennial inspections and 285 bridges and 25 canal structures have received underwater inspections. Mr. Olstad has performed Quality Control reviews on all but a few of the final inspection reports generated in these projects.

Prior to joining Clough, Harbour & Associates, Mr. Olstad worked 6+ years for Hardesty & Hanover on bridge inspection and design projects. Two significant projects while with H&H were:

- o Performed type, size and location studies for nine separate structures for an interchange modification for I-264 where it crosses the Elizabeth River in Norfolk, VA. Several alignments were studied for feasibility and ease of construction for each structure.

- o Performed inspection through final plan, specification and estimate preparation for rehabilitation of four bridges carrying I-95 over local streets in the New Haven, Connecticut area. A requirement of this project was that three lanes of traffic in both directions were to be maintained at full design speed during all stages of construction. The rehabilitations were designed for three phases of construction.

Professional Registration and Activities

Registered Professional Engineer in the States of Vermont, Connecticut, New York, Pennsylvania, Maine, New Hampshire, New Jersey, Massachusetts and Rhode Island

Member, American Society of Civil Engineers

7/26/93

GARY W. ROBINSON, P.E., ASSOCIATE

CHA

Position

Project Transportation Engineer

Education

Cooper Union, New York, New York/B.S. Civil Engineering/1969

Experience

Mr. Robinson has more than 20 years of experience in a wide range of transportation projects, with special emphasis on rail facility and highway projects. On rail facility projects he has been responsible for the design of trackwork, platforms, bridges, stations, roadway access and parking for stations, and evaluation of rolling stock. His rail experience covers light rail, mass transit, and heavy rail facilities. Specific design projects include:

- Project Engineer for a feasibility study to construct a new LRT (Light Rail Transit) line in the Scarborough Corridor of suburban Toronto, Canada. The potential $80 million project evaluated track alignment, station location, maintenance facility requirements, and rolling stock.

- Project Manager for the design of a new $42 million rail station in Providence, Rhode Island including Union Station, a 400 car parking garage, and two miles of new tracks. This intermodal station was the second largest new station project within the Northeast Corridor and Improvement Project and is located over a depressed 5-track corridor with two 800-ft. center island platforms.

- Engineering Director for the $12 million rehabilitation and modernization of the Historic City Hall and Walnut/Locust subway stations in Philadelphia. The work involved new finishes; corridor and stairway widenings; platform extensions; new lighting and HVAC systems; underpinning the historic City Hall during construction; and new mezzanines.

- Project Manager for the final design of four contracts for the Delaware Expressway (I-95) in Philadelphia, including the $50 million relocation of the Frankford Elevated mass transit line and the $72 million 12-lane Penn's Landing vehicular tunnel. The Frankford El. relocation consisted of 1.5 miles of new track, a new elevated station at Spring Garden Street, and the expansion and modernization of the existing below ground station at Second Street.

- Project Manager for a $180 million section of the new subway system in Los Angeles. The project consisted of one mile of two track tunnel and two new stations (Fairfax/Santa Monica and Sunset Boulevards).

- Engineering Director for: a study to develop a $250 million rail line using an existing Conrail corridor along the westside of the Hudson River in New York; a new heavy rail maintenance facility in Stamford, Connecticut; extensive modernization of rail maintenance facilities for NYCTA at East New York; and rehabilitation of the Park Avenue tunnel leading to Grand Central Station in NYC for Metro-North.

- Project Manager and Project Highway Engineer for the reconstruction of Delaware Avenue in Center City, Philadelphia. The reconstruction of this six-lane arterial street included the relocation of Belt Line Railroad into the median of the street in addition to eight signalized intersections that included train-preempt actuation.

- Project Manager for the replacement of a major local street bridge (Girard and Belmont Avenues) over an electrified, eight-track segment of the Northeast Corridor in Philadelphia.

- Project Administrator for an $18 million Northeast Corridor Improvement Project in Kearny-Secaucus, New Jersey, consisting of the rehabilitation of the Portal Swing Bridge and six other bridges for the main line railroad.

- Project Director for the design of sections 500 and 600 of the Blue Route (I-476) in the western suburbs of Philadelphia. This $80 million project involved the design of a 4-lane divided expressway through a historic and environmentally sensitive area. Earth berming, stream relocation, wetland development areas, and extensive use of sound barriers were integral parts of the design to mitigate impacts on the environment.

Professional Registration and Activities

Registered Professional Engineer

Member of:

American Society of Highway Engineers
New York Railroad Club
American Society of Civil Engineers
Society of American Military Engineers

3/7/93

WESLEY S. ECKER, I.E.

Position

Project Transportation Engineer/Noise Analysis Specialist

Education

Rensselaer Polytechnic Institute/B.S. in Civil Engineering/1989

Experience

Since joining Clough, Harbour & Associates, Mr. Ecker has been involved in a variety of projects which have lead to a broad engineering background. One of his responsibilities has been the preparation of noise studies for environmental impact statements using the Stamina 2.0/Optima computer program. In the noise studies, Mr. Ecker has addressed the issues of existing noise levels, future noise levels, noise impacts, mitigation measures, and construction noise levels. Recently Mr. Ecker attended the Advanced Traffic Noise Modeling Short Course at Vanderbilt University. He has completed noise studies for various jobs including:

- NYSTA, Mohawk River Crossing North of Interchange 26, Schenectady County, NY. New interchange, bridge, and connector roadway involving multiple alternatives.

- NYSDOT, I-90/Interchange 8 Connector to Route 4, North Greenbush, NY. New interchange and connector roadway involving two different alternatives and noise barrier analysis.

- Albany County DPW, Schoolhouse Road (CR204), US Route 20 to McKown Road. Roadway widening and bridge replacement involving intersection reconfiguration.

- Albany County DPW, Johnston and Krumkill Road Improvements. Realignment and widening of 4.0 miles of roadway.

- Town of Schodack, Proposed Go-Kart Track. Scope of study and review of noise study to determine noise impacts resulting from a proposed go-kart track.

- Schenectady Chemicals, Inc., GEIS for Proposed 10 Year Development Plan. Noise study to determine noise impacts resulting from expansion of existing facility.

- Scott Paper/Finch Pruyn Co., Proposed Sludge Management Facility. Noise study to determine impacts resulting from landfill operations and truck traffic.

Mr. Ecker has also been responsible for the design of several highway projects including: preliminary design and preparation of the Design Report/Environmental Impact Statement for a new bridge over the Mohawk River north of Thruway Exit 26, Schenectady County, NY; reconstruction of a three mile section of the NYS Thruway in Buffalo, New York; approach reconstruction and realignment for several bridge rehabilitations in Albany, Greene, and Rensselaer Counties; and roadway widening and intersection improvements on NYS Route 67 in Malta, New York, Washington Ave. in Albany, New York, and NYS Route 2, NYS Route 7, US Route 9 and Sparrowbush Road in Colonie, New York.

Mr. Ecker's responsibilities on these projects have included vertical and horizontal alignment, grading and drainage, typical sections, intersection layout, maintenance and protection of traffic, guide rail design, and signing and striping. He has also prepared final plans, specifications, engineer's estimates, and project manuals for several of the projects he has worked on.

More recently, Mr. Ecker has been responsible for the design of several Pavement Management Account projects for the Vermont Agency of Transportation. These fast-track projects included the recommendation and design of pavement rehabilitation and safety improvements for over 30 miles of highway.

Professional Certification and Activities

Registered Intern Engineer in New York State
Associate Member, American Society of Civil Engineers

8/2/93

ROBERT H. HITCHCOCK, P.E.

Position

Project Hydraulic Engineer

Education

Union College/Bachelor of Science in Civil Engineering/1983

Experience

Mr. Hitchcock began his career as a Civil Design Engineer subsequent to working in the construction industry. Since returning to the civil engineering field, his experience has been in site planning, roadway and parking lot design, grading, stormwater management and wastewater disposal.

Prior to joining Clough, Harbour & Associates, Mr. Hitchcock was Project Manager for consulting engineering firms in New Hampshire and New York where he was responsible for site planning, subdivision design and wastewater disposal.

Projects which Mr. Hitchcock has been responsible for include:

- Stow Mills, Chesterfield, New Hampshire. Designed a water supply, storage and distribution system for a privately owned industrial park. Low yield wells necessitated the use of atmospheric storage, hydropnuematic storage, booster pumps and low volume fire pumps.

- Town of Marlborough, Marlborough, New Hampshire. Assisted in securing Community Development Block Grant funding for, and managed the design of, a 3,900 LF sewage collection system to serve a low to moderate income neighborhood.

- Town of Hinsdale, New Hampshire, Walmart Site. Assisted Town officials in reviewing plans and inspection of building for compliance with zoning, building, and fire protection regulations.

- Town of Guilderland, Guilderland, New York. Developed a Kentucky Pipe Water Distribution model for the Town as part of a distribution system upgrade. The model contained over 200 nodes, 3 elevated storage reservoirs and several pressure regulating valves.

- Chesterfield Heights Planned Unit Development, Chesterfield, New Hampshire. Project Engineer for development of 200 acre lot into 100 units of cluster housing and 20 acres of retail and office space. Responsibilities included design of 4,000 feet of town road, drainage design and permitting.

- Village of Loon Mountain - Pollard Brook Condominiums, Lincoln, New Hampshire. Design of 5200' of roads, grading, stormwater management, acceleration/deceleration lanes on the Kacamagus Highway and state permitting.

- Southwest Region Planning Commission, Keene, New Hampshire. Project Engineer for the Rindge, NH, CDBG application for funding infrastructure improvements consisting of sewer, water and site development improvements.

- Orthopedic Partners, Brattleboro, Vermont. Site planning, parking, grading, utilities and permitting for a medical office building.

- PRT Realty - Gread Meadows, Swanzey, New Hampshire. Design engineer for a 30 lot subdivision. Responsibilities included design of drainage plan, design of entrance from New Hampshire Route 12, permitting, test pits and perc tests.

- County Hill Homes of New England - Hillwood Adult Community, Swanzey, New Hampshire. Design engineer for this 100 unit modular home development. Responsibilities included design of drainage basins, a 30' high dam, 7,500' of sewer collection, 4,000 lf of force main transmission line, 7,500' of water distribution system, water metering, 8,000' of road plan and profile, permitting and planning board presentations.

- Leonardo Industries - Krif Road, Keene, New Hampshire. Site planning for a 25,000 sf industrial facility on a lot adjacent to wetlands. Design of grading, drainage, parking, utilities and permitting.

- Cedarcrest Foundation, Keene, New Hampshire. Site planning of infrastructure for a new home for handicapped children. Design included grading, storm drain and detention basin, connections to city water and sewer utilities, circulation and parking.

Professional Registration and Activities

Registered Professional Engineer in the States of New Hampshire, Vermont and New York
Licensed Designer of Subsurface Disposal Systems in the State of New Hampshire

Member of:

American Society of Civil Engineers
American Water Works Association
American Public Works Association
Chi Epsilon - Civil Engineering Honor Society

JOSEPH S. LUKOVITS

Position

Intergraph Systems Manager

Education

Hudson Valley Community College/A.A.S. Construction Technology/1981

Experience

Prior to joining Clough, Harbour & Associates, Mr. Lukovits worked for a consulting engineering firm in Clifton Park, New York, where he served as the assistant draftsman and survey technician. In August of 1983 he joined the NYSDOT, Region 1 in Albany, New York. He served as a drafting technician working on numerous bridge rehabilitations. In November of 1984 he transferred to the Intergraph drafting department. Mr. Lukovits worked on the preparation of highway and bridge plans on the Intergraph computer drafting and design system. He was also responsible for the preparation of construction, survey, R.O.W. plans for the R.O.W. Department which were done on Intergraph.

Upon joining Clough, Harbour & Associates, Mr. Lukovits was trained on the AUTOCAD system and was responsible for the management of the Transportation Department drafting staff. His experience included the supervision of drafting for numerous highway projects including projects for NYSDOT and Vermont Agency of Transportation.

Currently, Mr. Lukovits manages the Intergraph Interactive Graphics Design System (IGDS). His training includes attendance at courses for workstation managers and "Inroads" applications. Mr. Lukovit's Intergraph project association includes transportation facilities designs for NYSDOT and VAOT and industrial designs for Mobil Oil Corp.

6/1/92

THOMAS R. JOHNSON, I.E.

CHA

Position

Project Traffic Engineer

Education

Clarkson University/B.S. in Civil and Environmental Engineering/1986
Hudson Valley Community College/A.S. in Mathematics and Science/1984

Continuing Education

Microcomputer Applications in Urban Transportation, American Society of Civil Engineers, 1987
Intersection Design and Channelization Workshop, and Traffic Signal Workshop, the Traffic Institute, Northwestern University, 1989
Dale Carnegie Course in Effective Speaking and Human Relations, 1990
TModel 2 Training Workshop, Metro-Professional Solutions, 1990

Experience

Mr. Johnson has experience in conducting site specific traffic congestion impact studies, transportation corridor studies and the design of congestion management systems. This experience includes data collection, origin destination surveys, parking studies, travel forecasting, accident studies, computer modelling, analyzing transportation facilities and recommending improvements to these facilities.

Mr. Johnson has designed many traffic signal systems that include isolated systems and coordinated systems. The designs included rural and urban areas for Towns, Counties, and the States of New York and Vermont. Specifics include analyzing traffic signal warrants, calculating the design load for signal poles and footing moments, locating vehicle detectors, and developing phasing and timing plans. Additionally, Mr. Johnson has written signal specification, prepared project manuals, attended bid openings, recommended awarding project contracts, and reviewed shop drawing submittals.

Mr. Johnson's experience with corridor and large planning area studies include developing future traffic volumes for different growth scenarios through the use of the computer modelling program "TModel". Roadway improvements, by-pass roadways, and transportation systems management programs were identified and construction costs calculated for the highway network to service each growth scenario. Specific experience of these planning studies include:

- Project Engineer for the Krumkill Area Traffic study to evaluate the impact of 2,000-6,000 new residential dwelling units in Albany County. The study evaluated capacity deficiencies, accident histories, and bridge and pavement conditions of roadway within the Krumkill area. The micro-computer transportation model "T-Model" was used to project traffic forecasts related to the new residential units. The study analyzed the effectiveness of low-cost intersection improvements and the construction of new "By-Pass" roadways to accommodate the projected traffic demands. Estimated construction costs of recommended improvements totalled over $8 million.

- Project Engineer for the Boght Road Generic Environmental Impact Statement (GEIS) in the Town of Colonie, New York. For the GEIS, traffic impacts were identified for the development of office, retail, industrial, and residential land uses. The transportation model "T-Model" was used to develop future traffic forecasts used for capacity analysis. Recommended improvements included new roadways, widening existing roadways, traffic signals and were estimated at $11 million.

- Project Engineer for the preliminary design and development of Design Report/Environmental Impact Statement for a proposed interchange to Interstate 90 in North Greenbush, New York. He was responsible for the traffic portion of the study that included traffic forecasts, route diversion, and capacity analyses. Improvements were recommended for each of seven different alignments connecting the interstate to the local roadway network.

Professional Activities

Associate Member, Institute of Transportation Engineers
Engineer-in-Training Certificate, 1987

4/19/93

WENDY C. PARKER, I.E.

Position

Project Traffic Engineer/Air Quality Analyst

Education

Worcester Polytechnic Institute
B.S. in Civil Engineering/1990

Experience

Ms. Parker has analyzed air quality impacts for a variety of NYSDOT, County and private development projects using the procedures outlined in the NYSDOT Air Quality Analysis Procedures, PEG Transmittal #42 Supplemental #1 and #2. Ms. Parker has had experience using the EPA accepted Hot Spot Verification Methods for Level I analysis of intersections as well as the FHWA accepted Caline 3 Graphical Solution Procedures for Level I analysis of free-flow conditions. Ms. Parker also has experience with analysis using the EPA approved CAL3QHC dispersion model. Ms. Parker's experience has included the following:

- Schoolhouse Road (CR204). This Albany County project involves the reconstruction of 3500 feet of Schoolhouse Road. Ms. Parker is conducting Level I free flow analyses for two worst case receptor locations and Level I and Level II intersection analyses at one worst case receptor site for both the build and no build conditions. Ms. Parker's responsibilities include determining the worst case receptor locations, developing nodes for the Level II analysis, determining the critical analysis year, conducting computer simulation, and preparing the report.

- Johnston Road (CR203). Ms. Parker was actively involved with the air quality impacts associated with the reconstruction of 4.5 miles of Johnston Road in Albany County. Her responsibilities included determining the critical analysis year and worst case receptor locations, conducting computer simulation, and preparing the report. This project involved analyzing four intersection worst case receptors and five free-flow worst case receptors for Level I conditions.

- Bear Swamp Road (NY Route 442). Ms. Parker was involved with determining the air quality impacts associated with the reconstruction of 3.95 miles of Bear Swamp Road in Clinton County. This project involved the analysis of one intersection worst case receptor at the Bear Swamp Road/US Route 9 intersection for the build and no build conditions. Her responsibilities included determining the worst case receptor location, conducting computer simulation and preparing the report.

- Interstate 90, Exit 8. Ms. Parker was involved with determining the Level I air quality impacts associated with the construction of a new multi-directional interchange on Interstate 90 in the Town of North Greenbush, New York. Ms. Parker's involvement included Level I analysis at intersection worst case receptor locations and report preparation.

- Mohawk River Crossing. Ms. Parker was involved with determining the air quality impacts associated with the construction of a new interchange, bridge and connector roadway in Schenectady County. This project included the analysis of free flow and intersection receptors for three alternatives using CAL3QHC, Version 2.0 procedures and Mobile 4.1 tables to determine vehicular emission rates. Her responsibilities included determining traffic volume forecasts, critical analysis year, and worst case receptor locations and conducting computer simulation and preparing the report.

Ms. Parker also has experience in other aspects of transportation engineering including, but not limited to; reviewing traffic studies for local municipalities, developing traffic impact studies, designing NYSDOT traffic signal systems. Her responsibilities have included data collection, speed and delay studies, trip generations/distributions, traffic forecasting, level of service analyses using the Highway Capacity Manual Software, accident analysis, sight distance analysis, and final report preparation. Ms. Parker has also had experience developing plans, profiles and cost estimates for highway design projects.

Professional Registration and Activities

Engineer-in-Training Certificate - New York, 1991
Associate Member, Institute of Transportation Engineers
Associate Member, American Society of Civil Engineers
Director at Large, Women's Transportation Seminar

8/2/93

WILLIAM S. CADMUS, III

Position

Party Chief

Education

Keene State College/A.S. Degree Manufacturing Technology/1988

Experience

Mr. Cadmus has held the position as Design Drafter, Crew Chief and Assistant Surveyor. He performs field traverse and note reduction, site layout, computations, mapping and title research for boundary surveys, subdivisions, site plans, construction stakeout, topographic surveys and flood plain determinations.

He also manages the CADD work stations utilizing SOFTDESK (formerly D.C.A.) software supported by Lietz Total Stations and Electronic Field Books. Mr. Cadmus has worked on numerous projects in the New England area including:

- National Park Service, Department of the Interior - Appalachian National Scenic Trail, Woodstock, Vermont. Boundary survey of approximately ten miles of corridor boundaries, utilizing Global Positioning Survey (GPS) to establish an overall horizontal control network.

- National Park Service, Department of the Interior - Appalachian National Scenic Trail, Rutland, Vermont. Boundary survey of approximately ten miles of corridor boundaries, utilizing Global Positioning Survey (GPS) to establish an overall horizontal control network.

- National Park Service, Department of the Interior - Appalachian National Scenic Trail, Norwich, Vermont. Boundary survey of approximately ten miles of corridor boundaries, utilizing Global Positioning Survey (GPS) to establish an overall horizontal control network.

- National Park Service, Department of the Interior - Appalachian National Scenic Trail, Cornwall Bridge, Connecticut. Boundary survey of approximately ten miles of corridor boundaries, utilizing Global Positioning Survey (GPS) to establish an overall horizontal control network.

- National Park Service, Lowell, MA. A high intensity topographic mapping project for the Lowell Historic Preservation Commission along 6 miles of inner city canalways in Lowell, Massachusetts utilizing AUTOCAD and SOFTDESK software to compiles base maps for the design of a scenic trail system along the canals.

- Trust for Public Lands. A 12,000 acre survey for the New York Department of Environmental Conservation utilizing G.P.S. and a combination of field survey data and aerial mapping to establish boundary lines controlled by elevations along a 15-mile long reservoir.

- Town of Clifton Park, NY Water Authority. Base map compilation for the acquisition of privately held public water supply sites.

- National Radio Astronomy Observatory. Boundary survey including town line location determination and site layout for the "Very Long Baseline Array" antenna site in Hancock, New Hampshire.

- CJH Investments. Boundary survey including town line location determination for a perimeter survey of a 1700 acre multi-parceled site in southwest, New Hampshire.

- United States Postal Survey, Windsor, Connecticut - Boundary survey of the Keene, New Hampshire Post Office site and adjoining parcel.

- Engelberth Construction Co. ALTA/ACSM survey in Keene, New Hampshire of two separate multi-unit apartment complexes.

- Town of Charlestown, New Hampshire. Boundary survey of town pool lot in order to define property line for proposed fencing.

- Wal-Mart Stores. Site survey including boundary survey for proposed shopping center in Hinsdale, New Hampshire.

- Town of Brattleboro, Vermont. Site surveys for sections of four roads proposed for construction.

- Bruce Smith, Hancock, New Hampshire - Boundary surveys of parcels in Hancock, New Hampshire.

- Foster-Wheeler Corporation. Site survey for proposed Trash To Energy Plant in Keene, New Hampshire.

- Winchester School District. Site survey for expansions to town school buildings in Winchester, New Hampshire.

- Chesterfield School Districts, SAU 29. Boundary and site survey for boundary line adjustments and proposed expansions.

Professional Registrations and Activities

New Hampshire Land Surveyors Association, 1988 - Present, Associate Member

EDWARD J. O'HARA, R.L.A., ASLA

CHA

Position

Project Landscape Architect

Education

State University of New York at Delhi/A.A.S. Env. Science/1983
State University of New York - Environmental Science and Forestry at Syracuse/B.L.A. Landscape Architecture/1986

Continuing Education:

Wetlands Construction and Restoration; Western Michigan University/ Wetlands Training Institute; 1991

Experience

Mr. O'Hara's experience has been in the private sector with consulting engineering firms. His responsibilities with Clough, Harbour & Associates includes Landscape Architecture and Land Use Planning.

Prior to joining Clough, Harbour & Associates, Mr. O'Hara was involved in Landscape Architecture for a private consulting engineering firm in charge of land use studies, grading and drainage and landscaping. A particular concentration was a 40 acre waterfront development in the Town of Brookhaven, New York which included residential development and waterfront recreational activities.

Mr. O'Hara's recent responsibilities at Clough, Harbour & Associates includes landscape design for the Colonie Shopping Center Expansion, Olympic Training Center in Lake Placid, Hannaford Warehouse, the Marriott Hotel Expansion, Colonie, New York, Washington County Office Building and site design for Longkill Park II in the Town of Clifton Park, New York.

Mr. O'Hara's latest project of note has been the completion of the final site plans for a 700,000 sq. ft. shopping mall in Latham, New York.

In addition, Mr. O'Hara has been responsible for the planning of a 7 acre wetland mitigation area for a shopping mall in Plattsburgh, New York and final wetland mitigation plans of 3 acres for a shopping mall in Latham, New York.

Mr. O'Hara's academic concentration was in Urban Planning which also included an undergraduate thesis on "Aesthetic Qualities of Urban Parks" in London, England.

Professional Registration and Activities

Registered Landscape Architect in the State of New York
Member, American Society of Landscape Architects

STEVEN R. WILSON

Position

Project Biologist/Wetland Specialist

Education

State University of New York College of Environmental Science and Forestry, Syracuse, New York/Bachelor of Science, Forest Biology/1986

Berkshire Community College, Pittsfield, MA/A.A.S. Environmental Science/1984

Continuing Education

Rutgers University, Cook College, New Brunswick, NJ/New Jersey Dept. of Environmental Protection and Energy Permit Seminar Series - Freshwater Wetlands/1993

Rutgers University, Cook College, New Brunswick, NJ/Identification of Freshwater Wetland Vegetation/1992

Rutgers University, Cook College, New Brunswick, NJ/Methodology for Delineating Wetlands/1991

Experience

Mr. Wilson has been actively involved in wetland delineation, functional evaluation, disturbance permitting and mitigation design at both the state and federal regulatory level. Work has included coordination with various local, state and federal regulatory personnel to develop the most environmentally sensitive design alternative which achieves project goals.

Mr. Wilson has worked on a variety of commercial and industrial projects for both the public and private sectors. Keynote projects include Susquehanna River Bridge Crossing, Broome/Tioga Counties, New York, New York State Thruway Exit 26 Mohawk River Bridge Crossing, Schenectady County, New York, and the Canadian Pacific Regional Automobile Compound Facility, Saratoga County, New York. Work on these projects has included on-site wetland identification, permitting requirement evaluation and field coordination with regulatory personnel.

STEVEN R. WILSON

Clough, Harbour & Associates has assigned Mr. Wilson to the position of Biologist/Wetland Specialist. Mr. Wilson is responsible for all wetland delineations under both state and federal guidelines. He is also responsible for the preparation of wetland disturbance permit applications, and the development of mitigation plans as specified by regulatory requirements.

Professional Certifications and Activities

Methodology for Delineating Wetlands - Cook College, Rutgers University
Member, Association of State Wetland Managers
Member, American Planning Association

4/13/93

LEWIS GENE WEBBER, R.L.A., ASLA

CHA

Position

Project Landscape Architect

Education

University of Virginia/Master of Landscape Architecture/1985
St. Johns College/Bachelor of Arts in Philosophy/1979

Experience

Mr. Webber's project experience includes recreational, institutional, industrial, residential and commercial work as well as municipal consulting. He currently serves as a project manager for interdisciplinary projects and discipline lead for landscape architecture in the Keene office. As a site planner and landscape architect, Mr. Webber is a specialist in developing creative solutions to complex planning problems. Mr. Webber's recent responsibilities at Clough, Harbour & Associates include:

- Community Business District Rezoning Study, Chesterfield, NH - Project Landscape Architect for the redevelopment of regulations for a new zone in the Town of Chesterfield. This project included a conceptual master plan for commercial development on 50 acres under the proposed regulations.

- Abenaqui Commerce Park, Wells, ME - Project Landscape Architect for the design of a 10 acre commercial/office park on Route 1.

- McGraw Hill, Byte Magazine, Peterborough, NH - Project Manager for design of site plans and construction specifications for the expansion of parking facilities at Byte Magazine.

- McGraw Hill, Peterborough, NH, Granite Bank Project - Project Landscape Architect in the development of alternate layouts for drive in teller stations on property abutting the Byte Magazine Facility.

- Coffman Realty, Gateway Center, Keene, NH, Retail Site Planning, Design and Permitting - Project Manager for the design of site plans for a four acre retail development at the intersection of key road Winchester Street and Route 9. Completion of this project includes circulation, building layout, parking design and final landscape design for the project and all associated permitting.

- Antioch New England Graduate School. Site planner and project landscape architect for development of permitting and construction plans for the relocation of the Antioch Campus to the former Sprague & Carlton factory site.

- First Vermont Bank, Chesterfield Heights, Phases V & VI, Chesterfield, NH -Project Manager for the design of a twenty nine lot cluster subdivision including residential and commercial lots. This project included design of 5,400 linear feet of new town roadway and design of a 38 lot subdivision with all required town and state permitting.

- Chesterfield Marine, Chesterfield, NH - Project Manager for design and permitting a site plan for a new marina on 2.0 acres of land in the Chesterfield Corporate Park.

- North Carolina Furniture Connection, Chesterfield, NH - Project Manager for the design and permitting of 20,000 sq. ft. wholesale retail furniture store in the Chesterfield Corporate Park. This project included extensive wetlands permitting and wetland replication design.

- The Moving Company, Keene, NH - Project Manager for development of a site plan for the proposed dance center on Railroad Street in Keene, NH. This project included extensive landscape design associated with the front yard and entrance to the renovated property.

- Granite Bank, Namaschaug Landing, Chesterfield, NH - Project Landscape Architect for the design of erosion control plans and design grading for completion of an abandoned site construction project on Spofford Lake. This project included a heavy emphasis on improvement of site aesthetics in the interest of encouraging lot sales in the Lakeside cluster development.

- Historical Society of Cheshire County, Archives & Gallery, Keene, NH - Project Manager for site plan design and permitting on the proposed 8,600 SF archives and gallery building.

Prior to joining Clough, Harbour & Associates, Mr. Webber served as a Project Manager and Landscape Architect in several civil/site firms.

Professional Registration and Activities

Certified Professional Landscape Architect in the States of New York and Massachusetts

Member of:

American Society of Landscape Architects
New Hampshire Landscape Association
Granite State Landscape Architects
Planning Board, Dublin, New Hampshire

JOHN M. TOZZI, P.E.

Position

Project Traffic Engineer/Air Quality Specialist

Education

Rensselaer Polytechnic Institute
M.S. in Civil Engineering/1986

Rensselaer Polytechnic Institute
B.S. in Civil Engineering/1984

Continuing Education

Traffic Engineering Short Course, Georgia Tech Education Extension, Georgia Institute of Technology, 1990
Dale Carnegie Course in Effective Speaking and Human Relations, 1990
Transportation Planning and Air Quality Conference, Sponsored by ASCE, Santa Barbara, California, 1991
Mobile Source Workshop Presented by the Environmental Protection Agency (EPA) Region 1, Warwick Rhode Island, 1991

Experience

Mr. Tozzi has used his strong engineering background in traffic operations to effectively model air quality impacts at signalized intersections, unsignalized intersections, and along free flow links. He has worked with officials from the New York State Department of Transportation Environmental Analysis Bureau (NYSDOT EAB) and the New York State Department of Environmental Conservation (NYSDEC) to model ground level carbon monoxide levels for a variety of public and private projects. Mr. Tozzi is proficient in the use of the MOBILE 4.1 emission model and the CAL3QHC dispersion model. Based on his experience working with NYSDOT EAB, NYSDEC and his contacts with EPA Region 1, Mr. Tozzi has a working knowledge of each models input parameters and overall capabilities.

The following is a partial listing of air quality projects in which Mr. Tozzi has analyzed traffic data, determined worst case receptor locations, analyzed air quality impacts, and prepared the technical reports which included appropriate graphics to show physical input parameters (i.e. free flow links, queue links, receptor locations, etc.) and all assumptions used in the modeling effort:

o Reconstruction of Schoolhouse Road, Albany County, New York

This project involves the reconstruction of 3,500 feet of Schoolhouse Road from a two lane facility to four lanes to provide adequate capacity for projected traffic growth in the corridor. Due to minor alignment changes and the proposed widening, detailed air quality modeling is being performed for the no-build and build scenarios to determine potential project impacts. Since CAL3QHC is now an accepted model to determine air quality impacts at signalized intersections, it is being used along with the MOBILE 4.1 emission model to analyze air quality impacts for this project.

o Latham Farms Plaza, Town of Colonie, New York

CHA was retained to prepare a full environmental impact statement for the construction of approximately 700,000 SF of retail development in the Town of Colonie. A complete traffic impact study and air quality analysis was performed for this project. Under the direction of NYSDEC, MOBILE 4.0 input parameters were selected and a modified CAL3QHC modeling approach was used to analyze air quality impacts.

o Extension of Southern Tier Expressway, Corning, New York

CHA was retained for NYSDOT design phases I-IV to perform all of the environmental studies and to prepare the draft and final environmental impact statement for this project which consisted of 2.8 miles of 4 lane expressway with 2 proposed interchanges on new alignments. All environmental impacts including air quality were evaluated in accordance with state and federal guidelines.

o I-90/Interchange 8, Rensselaer County, New York

This project involved development of the design report/environmental impact statement for a proposed multi-directional interchange and connector roadway to provide access from Interstate 90 to the study area. A variety of environmental investigations were performed including detailed air quality analyses for several project alternatives.

o Reconstruction of Johnston Road, Albany County, New York

This project involved the preparation of all environmental studies and preliminary and final design plans for the reconstruction of 4.0 miles of roadway in Albany County.

JOHN M. TOZZI, P.E.

Professional Registration and Activities

Registered Professional Engineer in the States of New York, Vermont, New Hampshire, Connecticut and Pennsylvania
Associate Member, Institute of Transportation Engineers
Associate Member, American Society of Civil Engineers

Publications

Transit Route Characteristics and Headway-Based Reliability Control. Published in the Transportation Research Record No. 1078
Co Author: Mark D. Abkowitz

MARGARET M. SCRODANUS

Position

Project Hazardous Materials Specialist

Education

College of Saint Rose/B.A. Biology/Chemistry/Cum Laude, 1985

Continuing Education

OSHA "40 Hour Hazardous Waste and Emergency Response Site Safety Course", Albany, New York 1988
OSHA "8 Hour Hazardous Waste and Emergency Response Site Supervisors Training", Albany, New York 1988
Dale Carnegie "Effective Speaking and Human Relations", Albany, New York 1989, 1990
"Technical Writing Course", Albany, New York 1990
"Zebra Mussel Conference", Buffalo, New York 1991
"Environmental Regulation Course", Boston, Massachusetts 1991
Clough, Harbour & Associates Relationship Grounded Entrepreneurship, 1992
Clough, Harbour & Associates Total Quality Management Team & Quality Council Member

Experience

Currently as Section Manager of Environmental Operations, Mrs. Scrodanus is responsible for management of the Environmental Operations Staff and projects involving environmental chemistry, air and water pollution, emissions, and regulatory compliance, site contamination, and the permitting, safe handling, and disposition of hazardous and non-hazardous wastes. These projects include work on environmental audits and assessments, landfill design, closure and reclamation, remedial investigation/feasibility studies, site closures and decommissioning, and multi-media environmental monitoring including state and federal pollutant discharge elimination systems, and Clean Air Act and bulk storage compliance. Clients served by the Environmental Operations group include industrial manufacturing facilities, municipalities, and commercial retail facilities.

Some of the major environmental projects managed by Mrs. Scrodanus consisted of the following:

- Control, containment, and monitoring of deicing agents released to the environment (stormwater and Class A water) from a county airport. Regulatory agency negotiations and coordination with multiple airline operations was a major task in completion of the scope of this project. Best Management Practices Plans, Wastewater/Stormwater Discharge Studies, Data Evaluation Studies, SPDES applications, and daily and monthly monitoring of deicing agents used and discharged were prepared and conducted, respectively.

- Environmental and OSHA audit of an arsenal's manufacturing and support operations for compliance with hazardous waste, air emissions, water quality and discharge, petroleum bulk storage, PCB, and health and safety regulations. Area-specific checklists were developed.

- PCB remediation and encapsulation projects for the New York State Department of Transportation. The first project involved contaminant plume identification, remediation, and confirmatory sampling while the second project involved full-time on-site monitoring of two PCB sites being encapsulated.

- Preparation of hazardous waste T/S/D permit applications for numerous manufacturing clients including preparation of permit application sections for the first New York State landfills designed under hazardous waste and paper sludge industrial waste criteria and preparation of recently required waste minimization and corrective action sections.

- Decommissioning of a large pharmaceutical research facility including multi-media assessments, subsurface investigations, and remediation of identified areas.

- Landfill Reclamation. A full-scale production and four feasibility studies for municipal landfill reclamation were managed by Mrs. Scrodanus. These projects involve assessment of landfill reclamation as an option for closure and/or to create landfill cell space, cover materials, and recyclable materials. This project consisted of preparation of engineering, health and safety, and contingency plans, full-time on-site inspection of field activities, data collection and evaluation, preparation of beneficial use and landfill footprint reduction applications, and seminar presentations of this new technology.

- RI/FS of an inactive hazardous waste landfill and metal plating facility including preparation of the RI/FS Work Plan and NYSDEC reports as well as regulatory agency negotiation.

As a member of the Company Central Safety Team, Mrs. Scrodanus is involved with all aspects of employee safety and training. Mrs. Scrodanus has developed, implemented, and conducted CHA's Safety Program including manuals, OSHA Hazardous Waste and Emergency Response Operations Training, OSHA Hazard Communication Training, Confined Space Entry Training, medical surveillance program, supplies, etc. These programs have also been developed by Mrs. Scrodanus for CHA clients.

Professional Registration and Activities

New York State Business Council Member (Environmental Committee)
American Institute of Chemical Engineers, Associate Member
National Safety Council Member (Industrial Subcommittee Member)
American Industrial Hygiene Association Member
American Chemical Society Member
American Society of Safety Engineers

ROBERT J. SIPZNER, P.E.

Position

Project Structural Engineer

Education

Polytechnic Institute of New York, Farmingdale, New York/BSCE/1981
Attended, NYSDOT Bridge Inspectors Training Seminar, August 1988

Experience

Upon graduation, Mr. Sipzner joined Ebasco Services in New York, New York as an engineer in the Estimating Department. His duties included civil and structural quantity and cost estimating for large nuclear power plants.

In 1982, Mr. Sipzner joined the firm of John J. Kassner & Company in Lake Success, New York as a Civil Engineer. His responsibilities included sanitary and storm sewer piping and infrastructure design, drainage and storm basin design and construction inspection. He designed urban and suburban roadways and performed hydraulic studies. In 1983, Mr. Sipzner joined the Structural Department at John J. Kassner & Company as a Structural Engineer where his design experience included truss inspection analysis and strengthening recommendations for army base building structures. Bridge design experience included steel and concrete superstructures, curved girder design, bearing, abutment and wingwall design. He was involved in the design of a major highway interchange in Glastonbury and East Hartford, Connecticut for the Connecticut Department of Transportation. For this project, Mr. Sipzner assisted in the design of several welded steel trapezoidal box girder bridges, designed all cross bracing, estimated material quantities, developed construction sequencing, performed the layout of various plan sheets, and performed the Q.C. review at various project phases as a member of the Q.C. Review Team. All phases of design include structural detailing of plan drawings.

In 1984, Mr. Sipzner joined Storch Associates in Westbury, New York as a Structural Engineer. Design responsibilities for bridge structures included investigations, preliminary reports and design of composite steel plate girders including framing, bracing and detailing. He inspected nine bridges in the New York City metropolitan area and wrote the monitoring inspection reports. Other design and analysis experience included rehabilitation of two bridges over railroads utilizing timber, steel and concrete design, and the inspection and analysis of three bridges over navigable canals.

ROBERT J. SIPZNER, P.E.

In 1987, Mr. Sipzner joined Greenman-Pedersen, Inc. in Albany, New York as a Senior Structural Engineer responsible for the investigation, analysis and design of bridges. He was involved in the design of structures for the Brooklyn-Queens Expressway/Gowanus merge in NY City. For this project, Mr. Sipzner performed the design of simple and continuous span structures including layout, design, analysis, estimating and the management of an engineering and drafting team. Structure types included steel stringer, welded box girder, and curved plate girder, utilizing the DESCUS curved girder program as a means of maintaining project progress.

Mr. Sipzner performed the preliminary design and ratings and wrote the bridge rehabilitation and project report for the rehabilitation of the Crown Point Bridge over Lake Champlain. This fourteen span structure connecting New York and Vermont involved tight maintenance and protection of traffic constraints. As complete closure of the Crown Point Bridge during reconstruction would necessitate an 80-mile land detour, it was necessary to alternate northbound and southbound traffic on one half of structure at a time. Due to the steep approach grades (5 1/2%) and length of structure (2190') the use of temporary traffic signals was required.

Mr. Sipzner performed the plan layout and analysis of several bridges on the Buffalo section of the New York State Thruway. He also designed and managed the preparation of contract plans for a single span prestressed concrete structure crossing a waterway in Saratoga, New York.

In 1988, Mr. Sipzner joined Clough, Harbour & Associates as a Senior Structural Engineer, responsible for design and analysis of bridges, waterway structures and buildings. Building design experience consists of the addition of a 4800 square foot storage platform within an existing building in Albany, New York.

Mr. Sipzner managed the design, analysis and layout of the structures for a major new highway interchange on Vermont's proposed Route 289 in Chittenden County. This project included 6 single and continuous span bridges over roadways and railways and 5 culvert crossings. Included in the design was the layout and analysis of a pile foundation pier within the interaction zone of the railroad. This substructure unit required the design of a temporary soil and live load supporting structure. A very accelerated schedule required very close tracking and rapid progression of contract documents. Railway crossing involved close conformance and communication with the Central Vermont Railway.

Additional bridge project management responsibilities include the rehabilitation of a single span structure in Thiells, New York; the layout, design and analysis of a 5 span bridge in West Nyack, New York; three local bridge rehabilitation/replacement projects in Putnam County, New York under the State Aid to Local Bridge Program (SALB) and a single span structure over Conrail in Middletown, New York. The single span structure involved close coordination and meetings with Conrail personnel, as well as approval submissions.

Mr. Sipzner was Team Leader on the inspection and non-destructive testing of welds on a New York State Thruway Authority bridge in Herkimer, New York. Mr. Sipzner was also Team Leader on the inspection of several other New York State and County bridges. He has recently performed numerous quality control reviews of biennial bridge inspections for the New York State Department of Transportation Region 1.

Waterway structure experience includes the rehabilitation of the dam and upper approach guide wall at Lock C-2 in Mechanicville, New York and the rehabilitation of the chamber walls, miter gate and upper approach guide wall at Lock C-3 in Mechanicville, as well as, minor modifications to the lower end of Lock C-4 in Stillwater, New York. Rehabilitation to Locks C-3 and C-4 are for New York State Electric & Gas Corporation. Mr. Sipzner is supervising the writing of the inspection and maintenance quality manuals for the New York State Department of Transportation, Waterways Division's Canal System, as well as performing the Quality Control review for various design projects.

Professional Registration and Activities

Registered Professional Engineer in the States of New York, New Hampshire, Vermont, Pennsylvania, and Connecticut

Member, American Institute of Steel Construction

4/28/92

KATHERINE L. BENTLEY, P.E.

Position

Project Structural Engineer

Education

Union College/B.S. in Civil Engineering/1983

Attended NYSDOT Bridge Inspectors Training Seminar, May 1989

Experience

Since joining Clough, Harbour & Associates in 1988, Ms. Bentley has served as Project Manager and has coordinated and/or performed the engineering design effort for numerous public clients. Specific projects include the following:

- Replacement of three bridges and reconstruction of one bridge for the County of Greene, New York. These projects involved study of repair/replacement options, design and preparation of contract documents, and construction inspection services. (7/90 to 3/92)

- Reconstruction of six (6) bridges on the Niagara Section of the New York State Thruway for the NYS Thruway Authority. The project included preparation of contract plans for deck replacement and widening, associated substructure rehabilitation, and structural steel repairs. (1/90 to 8/92)

- Design of four (4) new structures on the Chittenden County Circumferential Highway for the Vermont Agency of Transportation. Preliminary plans through final plans and specifications were developed for three single-span multi-girder bridges and one culvert structure. (11/88 to 10/90)

- Repairs to the Kaehler Lane bridge for the Town of Berne, New York. Repairs designed for this structure included H-pile and lagging walls to stabilize the existing abutments. (10/88 to 8/89)

Ms. Bentley has also served as Quality Control Engineer and has reviewed numerous inspection reports for New York State Department of Transportation Biennial Bridge Inspections. (5/91 to 12/92)

Prior to joining Clough, Harbour & Associates, from 1987 to 1988, Ms. Bentley was a Sr. Structural Engineer at Greenman - Pederson, Inc. in Albany, New York. Her responsibilities there included management and design of several replacement bridges for local counties (6/87 to 9/88); field evaluations and repair recommendations for twenty county bridges for the County of Saratoga, New York (5/88 to 9/88); and structural design of beams, curved girders, and pier girders on a 26-span viaduct (2/87 to 4/88). Ms. Bentley also inspected and prepared inspection reports for several bridges and a viaduct for the New York State Thruway Authority (2/88 to 5/88).

Ms. Bentley was employed as a Structural Engineer by Storch Engineers, Westbury, New York between 1984 and 1987. She was Project Engineer for rehabilitation of two concrete arch bridges on the New England Thruway (6/84 to 6/86) and for reconstruction of the 147th Street Bridge over the Long Island Railroad (7/86 to 1/87). Ms. Bentley participated in the rehabilitation design of several bridges in Queens, New York for the New York State Department of Transportation (7/85 to 9/86). She also was involved in the structural design of several additional bridges on the New England Thruway (6/84 to 6/86).

After graduation from college in 1983, Ms. Bentley joined N.H. Beltigole, P.C., Paramus, New Jersey. Her experience there included concrete spillway design, load rating of steel floorbeams on the Tappan Zee bridge, construction inspection, and several traffic projects (6/83 to 6/84).

Professional Registration

Registered Professional Engineer in the State of New York

4/12/93

RICHARD M. LOEWENSTEIN, JR., P.E.

Position

Senior Project Geotechnical Engineer

Education

Syracuse University/M.S. Civil Engineering/1980
Syracuse University/B.S. Civil Engineering/1979
SUNY College of Environmental Science and Forestry, Syracuse, New York/B.S. Forest Engineering/1978

Experience

Mr. Loewenstein's responsibilities, since joining Clough, Harbour & Associates in 1984, have included management of projects involved with geotechnical investigations and design, as well as hazardous and solid waste management. His duties include the review of design and report preparation activities of staff engineers and geologist within the Geotechnical/Environmental Service Group. He has been responsible for preparing subsurface exploration programs, design work and engineering reports for Washington County Sewer District No. 2 Interceptor Sewer and Treatment Plant construction, the Knickerbocker Arena in Albany, New York and the rehabilitation of the luge and bobsled runs in Lake Placid, New York. These projects involved the review of subsurface soil and groundwater conditions to develop foundation recommendations for support of the structures and field monitoring of foundation construction. Mr. Loewenstein has also had extensive experience involving slope stability, earth dam design and failure evaluation and design of excavation support systems, underpinning and retaining structures. His experience includes the evaluation of water front structures with regard to soil and foundation stability and dredging. He has acted as Project Manager and Lead Project Engineer for the design of improvements and repairs for earthen embankment dams and developed conceptual studies and final designs for new dams.

Mr. Loewenstein has been heavily involved in airport soils testing projects in support of our airport design staff. Some typical projects include runway and taxiway rehabilitation, apron expansion and rehabilitation, service roads, terminal buildings, and new taxiways. As the lead on those soil investigations, he is responsible for site access and safety, supervision of sampling, and interpretation of geotechnical data.

Mr. Loewenstein's transportation related project experience includes the following:

- Route 4 Bridge over the Hudson River. Project manager responsible for investigating environmental, structural, and geotechnical conditions of existing bridge foundations and two future alternate bridge crossing locations for submission to NYSDOT design engineers. The existing bridge piers were cored and sampled to investigate weak concrete, river bottom sediment samples were collected and evaluated for potential PCB contamination, and soils from proposed new abutment locations were sampled, tested and evaluated for strength and compressibility characteristics.

- Rensselaer Port Access Connector. Geotechnical project manager for investigating environmental and foundation conditions of roadway and bridge corridor. Highway alignment considered investigation of abandoned industrial landfill and worker health and safety requirements.

- Albany County Airport. Geotechnical project manager for Phase I terminal expansion, apron and taxiway improvements and design of deicing fluid containment lagoons.

- NYS Thruway Rock Slope Inventory. Directed team of engineers and geologists who evaluated rock slope stability for a mile stretch of I-87 and I-90 from Harriman to Buffalo, New York. A rating system was developed and contract plans and specifications prepared to remediate the most critical rock faces.

- NYS Thruway Pavement Rehabilitation, Niagara Section I-90. Geotechnical project manager responsible for obtaining subsurface information and preparing design recommendations for a 2.8 mile reconstruction project in Erie County, New York.

- NYS Thruway Authority Rest Plaza Remediation. Geotechnical project manager for design of hydrocarbon vapor/venting system below floor slabs of new rest area buildings. System design was required due to history of leaking underground storage tanks.

Prior to joining Clough, Harbour & Associates, Mr. Loewenstein held the position of Geotechnical Engineer for an engineering firm in Bethesda, Maryland, where he acted as project manager for geotechnical investigations related to shallow and deep foundation design, building renovations, pavements, subdrainage and earthwork. He completed geotechnical designs for support of multi-story office buildings, multi-unit housing and school campus developments, earth dams, retaining walls and communication towers.

CARSTEN H. FLOESS, P.E., PhD.

Position

Project Geotechnical Engineer

Education

Rensselaer Polytechnic Institute
Ph.D. Civil Engineering (Geotechnical Eng.), 1979
M.Eng. Civil Engineering (Geotechnical Eng.), 1975
B.S. Civil Engineering, 1974

Experience

Mr. Floess joined Clough, Harbour & Associates in 1990 after working 10 years with Mueser Rutledge Consulting Engineers in New York City. He was also an instructor at Rensselaer Polytechnic Institute from 1978 to 1979.

Mr. Floess has experience in a wide range of geotechnical engineering projects throughout the U.S. including embankment dams, tunneling, slope stabilization, ground freezing, landfill facilities, earthwork, and foundation design. His experience also includes numerous subsurface investigations on land and water, using both standard boring and sampling techniques and geophysical methods.

His current duties at Clough, Harbour & Associates include management of the geotechnical engineering section. Mr. Floess is responsible for all technical review aspects of his staff as well as proposal preparation and budget tracking.

Representative projects include:

- Pier Inspection, Key Bridge, Washington DC.
- Pier Stabilization, Mianus River Bridge - I95, Mianus, CT.
- Foundation Design, Hiawatha Blvd. Bridge, Syracuse, NY.
- Pile foundation design, various bridges, Albany County NY.
- Saxton-Colvin & Jay Arnett Tunnels, Rochester, NY.
- Broadview Road-Ravine Blvd. Relief Sewer Tunnel, Cleveland, OH.
- Little River Dam, Durham, NC.
- Cane Creek Dam, Chapel Hill, NC.
- Buckhorn Dam, Wilson, NC.
- University Lake Dam, Chapel Hill, NC.
- Goose Creek Dam, Charleston, SC.
- New York State Thruway Rock Slope Stabilization, Westchester County, NY.

CARSTEN H. FLOESS, P.E., PhD.

- o Landslide Stabilization, Panama.
- o Tunneling Using Artificial Ground Freezing, Heights-Hilltop Interceptor, Cleveland, OH.
- o Offshore Outfall, Mamaroneck, NY.
- o Seismic Vulnerability Study, Westvaco Mill Water Supply System, Charleston, SC.
- o Liquefaction Potential Studies, Taipei Subway, Taiwan, ROC.
- o Chemical Grouting, Cincinnati, OH.
- o Subsurface Investigations and Foundation Studies, Various Sites.
- o Stabilization of Fly Ash Lagoons, Johnstown. PA, and Louisville, KY.
- o Deicing Lagoon, Albany Airport, Albany, NY.
- o Dredging, Port of Albany, Albany, NY.
- o Wick Drain Design, Chittenden County Circumferential Highway, VT.

Professional Registration and Activities

Registered Professional Engineer in the States of New York, Vermont and Connecticut

Member, American Society of Civil Engineers
Member, ASCE Committee on Earth Dams and Slopes

Publications

"Evaluation of a Bedload Sediment Samples for USA-CANADA Watershed Studies", Environmental Aspects of Irrigation and Drainage, ASCE Specialty Conf., Ottawa, Ontario, Canada, 1976 (with T.F. Zimmie and Y.S. Paik).

"Lateral Stress Measurements in Direct Simple Shear Device", Laboratory Shear Strength of Soil, American Society for Testing and Materials, STP 740, 1981 (with R. Dyvik and T.F. Zimmie).

"Minimum Requirements for Temporary Support with Artificially Frozen Ground", Transportation Research Record 1190, 1988 (with H.S. Lacy).

"Artificially Frozen Ground Tunnel - A Case History", XII International Conference on Soil Mechanics and Foundation Engineering, Rio de Janeiro, 1989 (with H.S. Lacy and D.E. Gerken).

"Two North Carolina Water Supply Dams", Association of State Dam Safety Officials Sixth Annual Conference, Albuquerque, New Mexico, October 1989 (with D. Cordell and H.S. Lacy).

RICHARD M. LOEWENSTEIN, JR., P.E.

Professional Registration

Registered Professional Engineer in the States of New York and Maryland

Professional Organizations

National Water Well Association
American Society of Civil Engineers
New York State Association for Solid Waste Management