SUSAN ROMATZICK

PERMANENT ADDRESS

RR #3, Box 430
Wood's Grove
Winthrop, ME 04364

(207) 377-9634

EDUCATION

May 1988 Successfully passed Qualifying Exam and completed 43 of 48 course credits towards Ph.D. in Environmental Science at Cook College, Rutgers University, New Brunswick, New Jersey.

May 1982 M.S., Civil Engineering, Civil Engineering Department, University of Maine at Orono.

May 1978 B.S. Environmental Science, Cook College, Rutgers University, New Brunswick, New Jersey.

June 1974 Jonathan Law High School, Milford, Connecticut.

SCHOLARSHIPS AND HONORS

Employee of the Month Award for Sustained Exceptional Performance of Departmental Duties, August, 1989.

Special Merit Award for Sustained Exceptional Performance of Departmental Duties, September 10, 1986.

Outstanding Senior Woman for the Class of 1978, Cook College.

Four year recipient of the Marcellus Hartley Dodge Memorial Scholarship from the Dupont Company while doing undergraduate work at Rutgers University.

Member of Alpha-Zeta, an honor and service fraternity since October 1976.

Four year member of Cook College Student Government; President, 1976-77; Treasurer, 1975-76.

CAREER RELATED EXPERIENCE

August 1990 - Present: Instructor, Environmental Technology Program, Southern Maine Technical College, South Portland, Maine.

My responsibilities include the development and teaching of six college level courses to freshman and senior students. The topics range from hazardous waste management to analytical techniques to environmental law and regulation.

January 1990 - Present: Owner, Paladin Environmental, Winthrop, Maine.

My responsibilities include development of field sampling protocols, evaluation of process control and laboratory problems at domestic and industrial wastewater treatment facilities, identification of filamentous bacteria types in activated sludge, and the providing of both technical assistance and training to operators and the public in the areas of process control, troubleshooting and laboratory analysis.

CAREER RELATED EXPERIENCE (Continued)

January 1990 - August 1990: Environmental Specialist 4, Maine Waste Management Agency, Augusta, Maine.

My responsibilities have been to draft the siting criteria for new landfills and incinerators in the State of Maine. These criteria were adopted by the state's Facility Siting Board on May 16, 1990. Other duties include reviewing applications for new landfills submitted to the agency for approval and determining compliance with agency siting criteria. Responsible for coordinating agency use of Geographic Information System. Assisted with development of the Household Hazardous Waste Collection Program.

September 1988 - December 1988: Teaching Assistant, Pollution Microbiology Lab, Dept. of Environmental Science, Cook College, Rutgers University.

My responsibilities included all laboratory set up, instruction, and grading all laboratory exercises for a two-credit class of 25 upperclass and graduate students. In addition, graded all exams for the corresponding pollution microbiology course taught by Dr. Melvin Finstein.

January 1984 - January 1990: Assistant Engineer, DEP-Bureau of Water Quality Control, Division of Operation and Maintenance, Augusta, Maine.

My responsibilities include the generation of technical evaluations and reports in the areas of process control, laboratory and management of wastewater treatment plants. In addition, I am responsible for coordinating staff during treatment plant evaluations. Other responsibilities include providing technical assistance and training to other DEP staff, wastewater treatment plant operators, town officials, the general public and representing the state at public functions. I am also the inspector for several wastewater treatment plants and responsible for reviewing the design of new treatment facilities as well as their operation and maintenance manuals to insure the facilities will function as required.

November 1982 - January 1984: Chemist, Kennebec Sanitary Treatment District, Waterville, Maine.

I was responsible for managing the laboratory which included supervising laboratory staff as well as planning and scheduling all laboratory activities. In addition, my responsibilities included monitoring domestic. industrial and sludge utilization activities and evaluation of the facility's process control strategy. This work required not only managerial skills but also familiarity with standard chemical, biological and trace metal analysis. I also was responsible for implementing the quality control and surveillance programs and supervising the industrial pre-treatment and surveillance program.

June 1982 - November 1982: Research Technician, Center for Marine Studies, University of Maine at Orono.

I did research on a volunteer basis for Dr. Gary King and Dr. Lawrence Mayer. Work involved analyzing sediment samples for methane production, sulfate reduction, specific surface area and for total protein and DNA content. Both chemical and microbiological techniques were utilized to perform these analyses.

September 1979 - September 1981: Graduate Research Assistant, Department of Civil Engineering, University of Maine at Orono.

I did my masters work under the direction of Dr. Jerry D. Lowry. The title of my thesis was "The Use of Ultraviolet Light as an Alternative to Chlorination in Small Wastewater Treatment Systems". Work for this project included the design and development of an ultraviolet disinfection unit; evaluation of the ultraviolet unit's capabilities under both laboratory and field conditions; organizing and implementing the sampling program; and, supervising a part-time undergraduate student.

July 1981 - September 1981: Research Technician, Department of Civil Engineering, University of Maine at Orono.

I did consultant work for Dr. Chet A. Rock. My main responsibility was the analysis of sardine factory wastewater for oil content and for total suspended solids. Over 200 samples were analyzed during this study.

CAREER RELATED EXPERIENCE (Continued)

October 1980 - December 1980: Research Technician, Department of Civil Engineering, University of Maine at Orono.

I worked with Dr. Chet A. Rock on a project for which he was consultant. In coordination with two other graduate students, we set up four biological waste treatment reactors. We acclimated the bacteria in these reactors to an industrial solvent mixture which served as their food source. During this study, my responsibilities included general feeding and maintenance of these reactors along with daily preparation and analysis of all BOD_5 samples.

May 1978 - August 1979: Research Technician, Department of Environmental Science, Rutgers University, New Brunswick, New Jersey.

I shared responsibility with another research technician for the coordination of sampling and analysis of ground and surface water samples and sediment samples for PCB and pesticide analysis. In addition, my responsibilities included the operation and maintenance of all laboratory equipment, reviewing data for accuracy, training new employees, and assisting in the development of sampling protocol and analytical techniques for the analysis of trace organics in sediments. During the summer of 1979, I supervised eight undergraduate technicians and during the summer of 1978, I co-supervised twelve undergraduate technicians. I also coordinated the final report for the Potable Water Project being prepared for the New Jersey Department of Environmental Protection.

June 1977 May 1978: Research Assistant, Department of Environmental Science, Rutgers University, New Brunswick, New Jersey.

During the summer of 1977, I was a full-time research assistant. My duties included both the sampling and preparation of ground and surface water samples for trace organic analysis. I worked part-time during the academic year. My main responsibility was the preparation of all containers and equipment for trace organic sampling.

OTHER WORK/VOLUNTEER EXPERIENCE

April 1986 - Present: Planning Board Chairwoman, Winthrop, Maine.

During this time, the Board undertook the re-writing of Winthrop's Comprehensive Plan which has been approved by the Town Council. In addition, the Board is making major revisions to the town Zoning Ordinances.

June 1980 - June 1982: Minister of Music, Our Lady of Wisdom Parish, Newman Center, Orono, Maine.

My responsibilities included the coordination and supervision of four music groups, the organization of two music workshops each year, and assisting the pastor with planning any special liturgies.

ADDITIONAL PROFESSIONAL TRAINING

April 19, 1984	*"AC Variable Frequency Drives"*, 6 hours, Maine Wastewater Control Association
May 8, 1984	*"Submersible Pump Technical Seminar"*, 8 hours, Maine Wastewater Control Association
June 11-15, 1984	*"Optimizing Process Control of Activated Sludge Systems"*, 35 hours, New England Regional Wastewater Institute
July 23-24, 1985	*"Odor Control in Wastewater Treatment Systems"*, 15 hours, New England Regional Wastewater Institute

ADDITIONAL PROFESSIONAL TRAININD (continued)

November 7, 1985	*"You and the New Chemical Substance I.D. Law"*, 6.5 hours, Maine Joint Environmental Training Coordinating Committee
February 5-6, 1986	*"Management Practices"*, 12 hours, Maine Joint Environmental Training Coordinating Committee
February 13, 1986	*"Financial Management"*, 6 hours, Maine Joint Environmental Training Coordinating Committee
March 11, 1986	*"Negotiation Skills at Work"*, 7 hours, Maine Department of Personnel
April 16-18, 1986	*"Chlorination and Dechlorination of Wastewater Effluents"*, 18 hours, New England Regional Wastewater Institute
December 3, 1986	*"Pretreatment Program Implementation"*, 6 hours, U.S. Environmental Protection Agency
February 11, 1987	*"Assertiveness Training"*, 7 hours, Career Track Seminars
April 16 & May 12, 1987	*"Myers-Briggs Type Indicator"*, 10 hours, Maine Department of Personnel
June 21, 1987	*"Composting -- Rutgers Strategy"*, 6 hours, Maine Joint Environmental Training Coordinating Committee
May 25-26, 1989	*"Identification of Filamentous Organisms in Activated Sludge"*, 15 hours, New England Regional Wastewater Institute

PRESENTATIONS AND PUBLICATIONS

May 16, 1985	*"Maine's Approach to Identifying Problems at Municipal Wastewater Treatment Facilities"*, 3 hour presentation, U.S. Environmental Protection Agency, Region I, Operation and Maintenance Meeting.
June 21, 1985	*"Troubleshooting at Wastewater Treatment Facilities Using Computer Assisted Data Evaluation"*, 3 hour presentation, New England Regional Wastewater Institute.
October 8, 1985	*"Corinna 104(g) Operator Training Evaluation"*, 4 hour presentation, Maine Department of Environmental Protection.
December 11, 1985	*"Design Considerations for the Activated Sludge Process"*, 1 hour presentation, University of Maine at Orono, Department of Civil Engineering.
March 18, 20, 31, 1987 April 14, 1987	*"How to Trouble Shoot"*, 6 hour presentation, Maine Joint Environmental Training Coordinating Committee.
May 15, 1986	*"Maine 104(g) Operator Training Program"*, 2 hour presentation, U.S. Environmental Protection Agency, Region I, Operation and Maintenance Meeting.

PRESENTATIONS AND PUBLICATIONS (continued)

June 16, 1987	*"Maine's Financial Management Evaluation Process"*, 1 hour, presentation, U.S. Environmental Protection Agency, National 104(g) Training Meeting.
June 2, 1988	*"Biological Treatment of Small Wastewater Flows"*, 4 hour presentation, Maine Department of Environmental Protection.
Fall, 1988	*Pollution Microbiology Laboratory Course* - Graduate and Undergraduate levels.
April 5, 1989	*"Stabilization Ponds and Lagoons"*, 6 hour presentation, Maine Joint Environmental Training Coordinating Committee.
April 27, 1989	*"Chlorination and Dechlorination Issues"* , 1 hour presentation, U.S. Environmental Protection Agency, Region I, Operation and Maintenance Meeting.
April 28, 1989	*"Composting Using the Rutgers Strategy"*, 1 hour presentation, U.S. Environmental Protection Agency, Region I, Operation and Maintenance Meeting.
June 12, 1990	*"Optimizing Process Control of Activated Sludge Systems"*, 8 hour lecture/laboratory on microbiology in wastewater treatment systems, New England Regional Wastewater Institute

Romatzick, Susan. *"The Use of Ultraviolet Light as an Alternative to Chlorination in Small Wastewater Systems"*, Masters Thesis, Dept. of Civil Engineering, University of Maine at Orono, May 1982 (77 pages).

Lowry, Jerry D., Romatzick, Susan. *"UV Disinfection for Onsite Sand Filter Effluent"*, Office of Water Research and Technology, U.S. Dept of Interior, Project No. A-051-ME, May 1982 (32 pages).

[a]Maine Department of Environmental Protection. *"The P.U.D. Wastewater Treatment Facility Section 104(g) Operator Training Evaluation"*, Draft Report, September 1985 (72 pages).

[a]Maine Department of Environmental Protection. *"The Corinna Water Pollution Control Facility Section 104(g) Operator Training Evaluation"*, Draft Report, September 1985 (72 pages).

[a]Maine Department of Environmental Protection. *"The Rockland Wastewater Treatment Facility Section 104(g) Operator Training Evaluation"*, Final Report, November 1986 (68 pages).

[a]Maine Department of Environmental Protection. *"The Brewer Wastewater Treatment Facility Section 104(g) Operator Training Summary Report"*, November 1986 (23 pages).

[a]Maine Department of Environmental Protection. *"The Rockland Wastewater Treatment Facility Section 104(g) Operator Training Summary Report"*, December 1986 (28 pages).

[a]Maine Department of Environmental Protection. *"The Wiscasset Wastewater Treatment Facility Section 104(g) Operator Training Evaluation"*, Final Report, December 1986 (54 pages).

[a]Maine Department of Environmental Protection. *"Operations Management Evaluation - Saco Water Pollution Control Facility"*, January 8, 1987 (15 pages).

PRESENTATIONS AND PUBLICATIONS (continued)

[a]Maine Department of Environmental Protection. "*Operations Management Evaluation - Kennebunkport Water Pollution Control Facility*", January 20, 1987 (16 pages).

[a]Maine Department of Environmental Protection. "*The Wiscasset Pollution Control Facility Section 104(g) Operator Training Summary Report*", February 1987 (24 pages).

[a]Maine Department of Environmental Protection. "*The Ogunquit Wastewater Treatment Facility Section 104(g) Operator Training Evaluation*", Final Report, April 1987 (56 pages).

[a]Maine Department of Environmental Protection. "*The Orono Wastewater Treatment Facility Section 104(g) Operator Training Evaluation*", Final Report 1987 (60 pages).

[a]Maine Department of Environmental Protection. "*The Biddeford Wastewater Treatment Facility Section 104(g) Operator Training Evaluation*", Draft Report, January 1988 (90 pages).

[a]Maine Department of Environmental Protection. "*Operations Management Evaluation - Gardiner Water Pollution Control Facility*", January 20, 1988 (7 pages).

[a]Maine Department of Environmental Protection. "*Operations Management Evaluation - Kennebunkport Water Pollution Control Facility,*" January 20, 1988 (7 pages).

[a]Maine Department of Environmental Protection. "*Operations Management Evaluation - Farmington Water Pollution Control Facility*", January 15, 1988 (8 pages).

[a]Note: Current Division policy is to exclude an author's name on technical reports. My supervisors could verify that I was the principal author of these reports.

PROFESSIONAL AFFILIATIONS

Member of New England Water Pollution Control Federation since 1979.
Member of Maine Wastewater Control Association since 1982.
Member of Association of Maine Environmental Laboratories since 1983.
Member of Annabessacook Lake Improvement Association since 1985.

REFERENCES

References will be provided upon request.

RESUME

William L. Petitjean
(206) 222-6781

P.O. Box 1118
Fall City, WA 98024

SUMMARY OF EXPERIENCE

1988 - present - The Petitjean Co., Inc.: Self-employed as a contract mechanical engineer on steam plant, food processing and material handling projects.

1986 -1988 - Pacific Concrete Products, Inc.: Employed as General Manager of a specialty concrete products manufacturer. Responsible for all administration , plant operations and sales.

1984 -1986 - Power Recovery Systems - K.W. Energy Systems: Employed as Project/Sales engineer at above firms. Responsible for mechanical specifications, engineering support to sales, equipment installation, start-up and test and prototype development on cogeneration and alternative energy systems.

1981 -1983 - Skinner Engine Company: Employed as Sales Manager, Engines for the last steam engine manufacturer in the U.S. Responsible for rebuilding sales of steam engine product line.

1974 -1981 - Kenworth Truck Co. - MacManimum, Inc. - Flow Industries: Employed as Mechanical Engineering technician at above firms. Responsible for facilities maintenance, engineering test, vendor compliance, R&D and prototype development.

1975 - 1990 - Petitjean Bros. Lumber Co.: Held a partner's interest in a family owned, steam powered, custom sawmill business.

1982 - present - Published in trade journals, developed technical and marketing reports and presented technical papers at trade conferences.

EDUCATION

Acquired a sound, experience based engineering education. I possess a working knowledge of thermodynamics, machine design, structural analysis, engineering standards and practices and computer aided design using Autocad release 12. This education includes training and "hands-on" experience in machine tool operation, metal fabrication and machine assembly, installation, start-up and test.

Green River Community College
A.A.S. Mechanical Engineering Technology 1974
A.A.S. Machine Technology 1970

University of Washington
Two years undergraduate study Forest Engineering 1970-72

Certified Mechanical Engineering Technician 1977

References Available Upon Request

STEAM LOCOMOTIVE AND RELATED EXPERIENCE

1968 -1975: Puget Sound & Snoqualmie Valley Railroad, Lake Whatcom Railway and Skagit River Railway

Learned the locomotive trades from retired railroad machinists, boilermakers and engineers. Employed by the above excursion railroads to overhaul four locomotives. Overhauls included retubing boilers, staybolt work, changing tires, rod bushings, shoe and wedge work, setting valves, jacketing, lagging and piping.

1979 - 1992: Petitjean Brothers Lumber Company, The Petitjean Company, Inc.

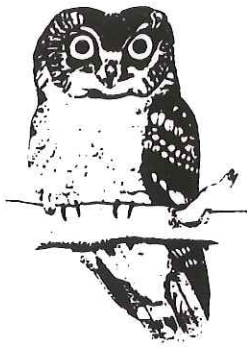
Designed and installed wood burning, reciprocating steam power plant for a family custom sawmill business. This plant included a vertical firetube boiler, 12" x 14" slide valve main engine and a two cylinder carriage feed engine. Plant equipment was upgraded over the years. Additions included an underfeed wood stoker, enlarged refractory furnace with new forced draft grate system, auxiliary propane burner system, and an exhaust feedwater heater and feedwater pump. This sawmill and power plant were sold in 1992 because the family participants liquidated the sawmill real estate.

1981 - 1986: Skinner Engine Company, K.W. Energy Systems, Self-employed, Contract Mechanical Design

Sold the last new Unaflow steam engine built in the U.S.. Re-established the design basis for the Skinner Unaflow engine product line and implemented several design improvements to upgrade engine line for modern conditions. Worked with ACE coal burning locomotive project to develop a joint Skinner/ACE steam plant for Mississippi towboats. Subsequent to leaving Skinner, continued small cogeneration work with K.W. Energy Systems using steam turbines and personally developed prototype design for an inexpensive line of small, medium speed, stationary steam engines.

1986 - Present: Self-employed, Contract Mechanical Design

Contract for a wide range of mechanical system and machinery design jobs, specializing in small steam power plants of all types. Locomotive and related jobs include: contracted with the Edaville Railroad to center up valves, adjust Stephenson valve gear, and provide drawings and documentation on ex-Monson engine #3. Contracted with local sawmill to specify, purchase and install a new wood stoker in an old 200 hp dutch oven boiler. Published technical steam locomotive articles in Locomotive & Railway Preservation Magazine. Currently providing technical design support on several steam locomotive replicas and a large steam reciprocating electric drive development project. Also providing a Maine woodworking plant with set up instructions and a control system that adapts an electronic governor to a steam engine-generator drive.



Woodlot Alternatives, Inc.

Woodlot Alternatives, Inc. (WAI) is a regionally recognized consulting group specializing in natural resource inventories and land management. The company is comprised of competent, professional staff with extensive backgrounds in wildlife management, forestry, botany, wetland and soil science, environmental regulation, natural resource management, and land-use planning. The staff of WAI have developed an excellent working relationship with Federal and State agencies, as well as numerous municipalities, local conservation commissions, commercial developers, engineers, and private land owners. Our goal is to always provide our clients with environmentally sound, state-of-the-art services and consultation.

Services

Wetlands Analysis
- Identification and Delineation
- Mitigation Plan Development
- Functional Assessment
- Determination of Regulatory Jurisdiction
- Creation, Restoration and Enhancement

Natural Resource Inventories
- Endangered and Threatened Species
- Rare Plants and Natural Communities
- Unusual Natural Areas
- Significant Wildlife Habitats
  (Deer yards, shorebird and waterfowl habitat)
- Aerial Photo Interpretation
- Landscape Analysis

Wildlife Inventory and Management
- Habitat Evaluation (HEP Certified)
- Critical Wildlife Habitat Inventory
- Wildlife Monitoring
- Habitat Enhancement
- Mitigation Plan Development

Land Management
- Resource Education
- Integrated Forest and Wildlife Plans
- Site Restoration
- Erosion and Sediment Control Plans
- Recreation/Nature Interpretation
- Phosphorous Export Modeling

Qualifications and Experience

The following is a listing of representative WAI projects and experience. Included is the name of the client, along with a brief description of the project. Inquiries concerning company qualifications and/or additional references are encouraged and may be received by contacting Woodlot Alternatives.

Inventory of the Bureau of Public Lands, Nahmakanta Management Unit - The Nahmakanta Management Unit is a 43,000 acre tract of forest, ponds, and mountains in central Piscataquis County, Maine. The Maine Bureau of Public Lands hired WAI to assist in developing a management plan for this newly purchased property. We performed a comprehensive natural resource inventory of the management unit for BPL's use in developing a management plan for the parcel.

Inventory of Nancy Brook Research Natural Area, White Mountain National Forest, New Hampshire - A survey of the flora, fauna, and natural communities of Nancy Brook Research Natural Area (RNA) was conducted during the summer and fall of 1992. Nancy Brook RNA is noted for containing the largest virgin mountain spruce-fir forests in New Hampshire, and one of the few remaining in the United States. The primary purpose of this study was to characterize major natural communities observed in the RNA.

54 Cumberland Street • Brunswick, Maine 04011 • 207-729-1199 • Fax 207-729-2715

Expert Witness Mediation Hearing: Portland, Maine - Burns & Levinson. WAI performed Standard of Care research at the Maine State Archives and Records, performed personal interviews, prepared expert reports, and presented testimony. The information WAI prepared was used to establish the Standard of Care in regards to wetland delineations during the mid to late 1980s. Reference: Michael G. Tracy Esquire 617/345-3000.

Expert Witness Court Testimony: Freeport, Maine - Town of Freeport. WAI staff provided critical, expert forestry/wildlife testimony supporting the Town of Freeport in Superior Court. Reference: Jacqueline Cohen, Town Planner, Town of Freeport 207/865-4743.

Mt. Redington Wind Farm: Redington Township, Maine - Endless Energy Corporation. WAI is conducting ecological surveys and assisting in environmental permitting in high elevation and sub-alpine natural communities for a 15 megawatt wind farm in western Maine. Surveys include: natural community assessments, wetland/vernal pool delineation/assessments, identification of Significant Wildlife Habitat, raptor migration studies, small mammal trapping, and breeding bird surveys. Reference: Harley C. Lee, President, Endless Energy Corporation, RR 2 Box 2370, New Gloucester, ME 04260 207/926-4698.

Carriage Road Rehabilitation: Acadia National Park, Bar Harbor, Maine - VHB. WAI was responsible for recreating vistas along the 54 mile long carriage road system in Acadia National Park. We developed site-specific harvesting prescriptions and low-maintenance long term management plans for vistas including erosion control methods, slope stabilization, and revegetation. Reference: Mike Williams, Project Supervisor, Acadia National Park, Bar Harbor, ME 04609 207/288-4646.

Candidate Low-Level Nuclear Waste Site Surveys: T2R9, Summit, Unity & Pittston, Maine - WAI was contracted by local communities to conduct independent ecological surveys of candidate low-level radioactive waste sites that had been previously identified by the Maine Low-Level Radioactive Waste Authority. Survey recommendations were instrumental in the eventual elimination of these areas as candidate sites. Reference: Matt Scott, Deputy Director, Maine Low-Level Radioactive Waste Authority, 99 Western Ave., Suite 6, Augusta, ME 04332-5139 207/626-3249.

Wetland Delineation and Functional Value Assessment - Loring Air Force Base - ABB Environmental Services, Inc. WAI delineated wetlands and performed WET II functional value assessments on Loring Air Force Base in northern Maine. Work on-site required OSHA-approved hazardous waste training (29 CFR 1910.120) and use of air and radiation monitoring equipment. Reference: Michael Murphy, Project Manager, ABB Environmental Services, Inc. 207/775-5400.

State Wetland Identification and Delineation Training Course - Maine Department of Economic and Community Development. WAI played a principal role in developing and presenting a Wetland Identification and Delineation Course for local Code Enforcement Officers. Several regional courses were presented, providing each CEO with classroom and field training for Certification. Reference: Linda Boothby, Office of Community Planning, DECD 207/289-6800.

Significant Wildlife Habitat Mapping: Central/Southern Maine - Maine Department of Inland Fisheries and Wildlife (MDIFW). WAI was responsible for identifying and mapping deer wintering areas, wetlands, and other Significant Wildlife Habitat throughout 40 towns in southern and central Maine. WAI continues to regularly evaluate individual properties for the presence, and absence, of regulated habitats. Reference: Gary Donovan, Director, MDIFW Wildlife Division 207/289-5252.

Proposed Landfill Sites: Eastern Maine - James River Corporation. WAI delineated and assessed U.S. Army Corps of Engineers (ACE) and State (DEP) jurisdictional wetlands on over 58 potential landfill sites within 7 towns in eastern Maine. WAI worked closely with Company engineers to assess the feasibility of constructing a landfill in compliance with Maine solid waste and Federal Clean Water Act laws. WAI provided critical mitigation and natural resource consultation and testimony at meetings with regulatory personnel. Reference: Wendy Porter, Environmental Coordinator, James River Corporation 207/827-7711.

Maine Department of Transportation Road Reconstruction Projects - Maine Department of Transportation (MDOT). WAI has identified and delineated all natural resource features subject to local, State, and Federal regulation for various road reconstruction project corridors throughout Maine. WAI was instrumental in assisting the MDOT in developing their own natural resource inventory and mapping process. In addition, WAI continues to work with all relevant State and Federal natural resource agencies in regard to MDOT reconstruction projects. WAI regularly prepares detailed reports, attends meetings with regulatory agencies, and develops state-of-the-art wetland and wildlife mitigation plans. Reference: William Reid, Director, Environmental Services Division 207/289-3321.

Environmental Assessments of Transmission Lines: Central and Southern Maine - Central Maine Power Company (CMP). WAI has located and assessed significant natural resources on existing and proposed transmission line right-of-ways, and other CMP properties. WAI routinely provides recommendations for State and Federal land use regulation compliance; helicopter and site surveys and delineations for wetland habitat and other sensitive areas; comprehensive erosion control recommendations and seminars; and the formulation of a company-specific Erosion Control Manual. Reference: David Dominie, Supervisor, Permitting & Licensing, CMP 207/623-3521.

Natural Resource Management Plan: Old Town, Maine - Diamond Occidental Forest Inc. (DOF)/James River Corporation. WAI, in conjunction with DOF foresters, provided James River Corporation with a timber and wildlife management plan for the 747 acre West Old Town Forest. The purpose of the plan was to enhance wildlife populations and habitat while managing and maintaining a diversity of forest types, heights, and age classes. Reference: Ted Shiga, Manager, Woodlands Division, Diamond Occidental Forest Inc. 207/827-4471.

Wetland Mapping: Old Orchard Beach, Maine - Town of Old Orchard Beach. WAI delineated all wetlands within the Town of Old Orchard Beach that met the Federal and State definitions. Each wetland was classified and rated using a computer model designed by our staff. In addition, a report describing each wetland, and recommended management plans for specific wetlands, and wetlands in general, was published. Reference: OOB Town Planner 207/934-5714.

1990 Inventory of Unique Natural Features in Oxford County - Maine Department of Economic and Community Development. WAI conducted an inventory of rare and endangered plants, and plant communities in Oxford County in 1990. WAI personnel, in conjunction with independent botanists L. Eastman and S. Holmes, performed a landscape analysis of the entire region, providing critical information on locally and regionally occurring rare plants, and rare natural communities. Reference: John Albright, Director, Natural Heritage Program 207/289-6807.

Maine Lakes Study: Organized Towns of Maine - State Planning Office. In conjunction with Drew Parkin, WAI conducted aerial and ground surveys of lakes within organized townships to determine which Maine lakes would be considered Significant natural resources. This survey involved extensive data base inventories of over 150 significant lakes, resulting in a natural resource data base able to be regularly updated and modified to meet specific planning needs. Reference: Hank Tyler, Director, Critical Areas Program 207/289-3261.

Hydro-Quebec Transmission Line Study: Western and Central Maine - Central Maine Power Company (CMP). WAI was subcontracted by The Nature Conservancy to conduct searches for selected rare plants, animals, and community types in areas along a proposed transmission line route. Collected information was instrumental to CMP's final report to project regulators. Reference: John Albright, Director, Natural Heritage Program 207/289-6807.

Private/Commercial Developers: Maine - WAI has delineated wetland boundaries and/or provided functional wetland assessments for over 300 subdivisions and development projects in over 100 individual Maine communities, according to local, State, and Federal wetland definitions. Projects have ranged from 1 to 3,000 acres in size. Recommendations regarding permit applications and mitigation procedures and opportunities were developed. References: Jay Clement, U.S. Army Corps of Engineers 207/623-8124; Don Witherill, Director; Division of Natural Resources, Maine Department of Environmental Protection 207/289-2111.

Private/Commercial Landowners: Maine - WAI has developed numerous integrated Forest and Wildlife Management plans that provide clients with an appraisal of their current and projected timber volumes and conditions, and furnish the basis for a multiple-resource forest management strategy. Plans are developed to meet the goals of the client, and to create a management strategy that provides for sustained yields of timber and forest-related resources. Management plans are designed to meet the requirements of the Maine Tree Growth Tax Law and the Forest Stewardship Assistance Program. Reference: Ancyl Thurston, Staff Forester; Maine Forest Service 207/289-2791.

Woodlot Alternatives, Inc.

JOHN P. LORTIE
54 Cumberland Street
Brunswick, Maine 04011
207-729-1199

Experience and Employment History

Woodlot Alternatives, Inc: Wildlife Biologist and Botanist, Brunswick, Maine. 6/87 - Present. Founder and President of an environmental consulting firm that specializes in rare plant, animal and natural community identification and management; wetland identification, mapping, evaluation and mitigation; land management plan preparation; and natural resource land use planning. Experience includes: evaluation of potential impacts on wildlife and wetland resources from numerous projects, including highway reconstruction, hydropower development, residential development, and power transmission lines; interpretation of land use laws and determination of regulatory jurisdiction; providing guidance, training; coordinating and conducting inventory/mapping of significant wildlife habitat and wetland resources throughout Maine towns; coordination with Maine State agencies such as DOT, DEP, IFW, SPO, and LURC.

U.S. Fish and Wildlife Service: Biological Technician, Wells, Maine and Newton Corner, Massachusetts. 7/84 - 5/87. Coordinated and conducted wildlife research and management activities at Rachel Carson National Wildlife Refuge. Prepared environmental assessments, refuge master plans, monthly and annual wildlife use reports, and reviewed state wetlands alteration permits. Provided land use guidance to local towns and organizations in southern Maine. Prepared refuge Master Plan for Monomoy National Wildlife Refuge. Represented the US Fish and Wildlife Service at public hearings.

U.S. Fish and Wildlife Service: Refuge Manager, Chatham, Massachusetts. 4/83 -9/83 and 3/84 -7/84. Coordinated and conducted wildlife research and management activities at Monomoy National Wildlife Refuge. Performed extensive inventories of breeding birds, migratory birds and mammals, non-migratory mammals, plants, reptiles and amphibians. Prepared monthly and annual wildlife use reports.

Canadian Wildlife Service: Biological Technician, Sackville, New Brunswick. 9/81 - 11/81 and 7/82 - 11/82. Conducted waterfowl banding activities throughout the Maritime Provinces using an airboat. Set up and operated waterfowl trapping and banding operations in remote areas. Responsible for collecting detailed field notes and for preparing complete banding schedules and reports. Assisted in Atlantic Salmon tagging operations.

U.S. Fish and Wildlife Service: Biological Technician, Calais, Maine. 5/80 - 9/80 and 5/81 - 9/81. Conducted research on American Woodcock ecology at Moosehorn National Wildlife Refuge. Surveyed freshwater wetlands for breeding waterfowl. Responsible for collecting accurate data, analyzing data, and report writing.

University of Maine at Orono, Entomology Department: Laboratory Aid II, Orono, ME. 5/79 -5/80 and 9/80 - 5/81. Assisted in aquatic invertebrate ecological research. Collected and analyzed drift, grab, and substrate samples. Identified and sorted aquatic invertebrates.

Education

Bachelor of Science in Wildlife Management, May 1981, University of Maine at Orono.

Certification

Certified Wildlife Biologist, The Wildlife Society, Washington, D.C.

Committees

Maine Environmental Priorities Project, 1994
Ecological Work Group, 1994

Maine Natural Heritage Program Botanical Advisory Group, 1990 - present

University of Maine, College of Forest Resources Forest Resources Advisory Committee
Wildlife Subcommittee, 1990 - present

Maine Association of Wetland Scientists
President, 1994
Legislative Committee, Chair 1991 & 1992

The Wildlife Society, Maine Chapter
Secretary/Treasurer, 1989 & 1990
Wetlands Committee, 1989 - present

Bureau of Public Lands
Nahmakanta Management Unit Advisory Committee, 1993 - present

Wells National Estuarine Research Reserve
Research Committee, 1986 - 1993; ad-hoc advisor 1994

Training

40-Hour Safety Training Course for Hazardous Waste Operations in Compliance with OSHA 29 CFR 1910.120. September 1993.

Publications

Royte, J.L., D.D. Sperduto, and **J.P. Lortie**. In Press. A botanical reconnaissance and natural community survey of Nancy Brook Research Natural Area, White Mountain National Forest, Grafton County, New Hampshire. U.S. Forest Service, Northeast Forest Experiment Station.

Lortie, J. P., J. L. Royte, S. C. Rooney, and J. S. McMahon. 1993. Landscape Analysis and Inventory of the Nahmakanta Management Unit. Maine State Planning Office, Augusta, Maine.

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Lortie, J. P. 1992. Wetlands identification and delineation. Pages 1-16 in Wetland and Shoreland Zoning Laws Affecting the Use of Real Estate. Maine State Bar Association. 235 pp.

Lortie, J. P., B. A. Sorrie, and D. W. Holt. 1991. Flora of the Monomoy Islands, Massachusetts. Rhodora 93(876): 361-389.

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Lortie, J. P. and D. O. Parkin. 1988. An evaluation of scenic quality on lakes in Maine's organized towns. Maine State Planning Office, Critical Areas Program, Augusta, Maine.

Parkin, D.O., **J. P. Lortie**, R.C. Humphrey, and F.J. DiBello. 1988. The Maine Lakes Study, A Statewide Inventory of Maine Lakes. Maine State Planning Office, Critical Areas Program, Augusta, Maine.

Parkin. D. O. and **J. P. Lortie**. 1988. Lake Beaches in Maine's Organized Towns. Maine State Planning Office, Critical Areas Program, Augusta, Maine.

Parkin, D.O. and **J. P. Lortie**. 1988. The Maine Lakes Study, A Statewide Inventory of Maine Lakes, Work Plan. Maine State Planning Office, Critical Areas Program, Augusta, Maine.

Jones, J.J., **J.P. Lortie**, and U.D. Pierce. 1988. The identification and management of significant fish and wildlife resources in southern coastal Maine. Maine Department of Inland Fisheries and Wildlife, Augusta, Maine.

Lortie, J.P. and S.K. Pelletier. 1987. Distribution and abundance of breeding birds and small mammals in the high salt marsh and adjacent upland critical edge in southern Maine, 1986. Included in Proceedings of the Maine Biological and Medical Science Symposium, abstract only, Bowdoin College, Brunswick, Maine.

Holt, D.W., R.C. Humphrey, and **J.P. Lortie**. 1987. The mammals of Monomoy National Wildlife Refuge. The Cape Naturalist 15(4): 63-69.

Holt, D.W., **J.P. Lortie**, B.J. Nikula, and R.C. Humphrey. 1986. First record of Common Black-headed Gulls breeding in the United States. American Birds 40(2): 204-206.

Lortie, J.P., D.W. Holt, and R.C. Humphrey. 1985. Evaluation of gull control methods used on Monomoy National Wildlife Refuge, Massachusetts, 1980-1984. USFWS Refuge Manage. Study.

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MOHR & SEREDIN

Landscape Architects, Inc.

June 14, 1994

Mr. Richard Knowland, Senior Planner
City of Portland Planning Department
City Hall
389 Congress Street
Portland, ME 04101

Re: Maine Narrow Gauge Railroad Amended Site Plan Review

Dear Rick,

In response to your telephone call of the 22nd, on behalf of MNGRR we offer the following for your review:

1. Financial Capability: as indicated in the June 14 submission to the City, the Museum currently owns all the tracks and ties and some of the ballast required for the installation of the tracks proposed in this project. The labor for installation will be provided by Museum Trustees, members and volunteers.

   The estimated value of the labor and materials required to install the track is in the range of $18,000 to $24,000. MNGRR will provide the Planning Board with a letter of financial capability, notwithstanding the fact that it is not really required due to the unique circumstances of this project. This letter will be provided to your department prior to the meeting on the 28th.

   Once installed, the track must be inspected and certified by the State. If it is not installed correctly or completely, the Museum cannot offer train service on the tracks. Without train service on the tracks the whole point of this phase, getting the public onto the train, is lost. Therefore, there is a direct incentive for MNGRR to assure that this work is completed.

2. Sidewalks: In the previous Planning Board review with the Museum, the Board approved the internal walkways and Museum circulation. Mr. Bray had reviewed this layout, and the defined walkways within the lot are typical to parking lots found throughout the City. The walkways were located in anticipation of the train service, so the intensity/frequency of use will not be altered from what was previously approved by the Board.

18 Pleasant Street, Portland, Maine 04101
(207) 871-0003

3. Noise: The June 14 submission details the noise sources and levels associated with the train. The bell was not discussed, and will be included as part of the operations of the train. The bell and whistle will be operated to comply with the noise levels set by ordinance in each zone. As set forth in the ordinance, these are 55 (WSUZ) and 75 (WPDZ) measured at the closest residential neighborhood.

   As previously stated, the whistle will be operated for a one (1) to three (3) second note upon arrival and departure. This will amount to a maximum total of 10 soundings per day, for a total maximum duration of 30 seconds. The only exception to this will be for emergency use. The use of the bell will be restricted to intermittent intervals upon departure and arrival. The bell will be rung for 5 to 10 seconds at each end of the trip.

   MNGRR has worked, and will continue to work, as a good neighbor to the Munjoy Hill neighborhood. The hours of operation, track layout and train operations all reflect the concerns of the neighbors. MNGRR agrees with the City that the best way to assure that noise is not an issue, and agrees to having the City staff measure the noise of the train from the west edge of the Fore Street side of the neighborhood, as specified by the ordinance. MNGRR requests that this work be performed by the City staff trained on the equipment, with properly calibrated equipment, and with Museum staff present.

   The steam locomotive takes 3 1/2 hours to steam up, and a similar time to cool down. The engineer has a two hour commute from New Hampshire, and the steam engine is in the process of being worked on after its use at the rail fair. Accordingly, the noise tests cannot be performed prior to the meeting. MNGRR agrees to this testing being a condition of approval, should this continue to be a concern of the Planning Board.

4. Pedestrian Crossings: As stated in the June 14 submission, MNGRR will construct at it's own expense, crossings for existing pedestrian and vehicular crossings of the proposed track. This will include a vehicular and pedestrian crossing for BIW and two combined vehicular/pedestrian crossings for Portland Yacht services. In addition, MNGRR has offered to construct a pedestrian crossing where the new trail is proposed to cross the tracks.

   All crossings are proposed to be gravel ramped and ballasted crossings. Any further modifications to those crossings will have to follow the requirements of MDOT, MNGRR's landlord. Any person desiring a crossing must petition MDOT and workout the details, locations and costs. Any costs for upgrading of the crossings are borne by the petitioner, not MNGRR. MNGRR has agreed to follow the recommendations of the Eastern Prom Trail Advisory Committee with respect to safety equipment warning

devices and other improvements required as a result of the existence of the track, as long as they are approved by the landlord, MDOT.

5. Track Cross Section: The track cross section submitted to the City as a part of the June 14 package is the section which MNGRR will be utilizing for construction of the 3,400 feet of trail line. MDOT has reviewed the options for vertical track placement, and is requiring that the track ties and ballast be elevated above existing grade. As a tenant within the MDOT Corridor, MNGRR must follow the directives of the landlord.

6. Operations Agreement: The City has a copy of the current, draft operating agreement in the office of the Corporation Counsel. An additional copy is attached with this submission, as requested by staff.

7. Drainage: The issues raised by Craig Carrigan's memo were reviewed in the field with Craig on June 23, 1994. Based on the existing conditions and proposed track layout, additional drain lines under the track have been proposed, and a new swale at the east end of the line near PYS proposed to drain to the existing 18" culvert. A summary of the drainage changes is as follows:

   (1) Add 6" ductile iron, class 52 pipe at several locations where drainage may need to pass through the track ballast.
   (2) Shape a new, 3 to 4 foot wide, 6" to 14" deep vegetated swale along the north side of the tracks. This will extend from the existing culvert south, 140 to 150 feet.
   (3) Add an 8 to 10 square foot area of D_{50}=6" rip-rap at the outfall of the existing 18" culvert.

   The plans have been revised to show the changes set forth above.

8. Floodplain Zone: A portion of the proposed track is located within the A2 flood zone (elev. 10). This area is behind the existing seawall (elevation 13) as shown on the FEMA maps as submitted on June 14. A Floodplain Narrative is attached addressing the ordinance standards.

9. Herbicide: The issue of herbicide use was addressed in the June 14 submission. Spraying will be only on an as needed basis (maximum 1 time/year) by licensed applicators, with appropriate herbicides which will not migrate to Casco Bay.

10. Coal Bin: The coal bin location has been shown on each of the submissions to the City, near the Engine House. The coal bin will be covered.

11. Track Location: The track location has been labeled "centerline" as requested by City staff.

12. Track Dimensions: Additional track location dimensions have been added per City staff comments.

This addresses the items we discussed earlier this week. Please call if you have any questions.

Sincerely,

Stephen B. Mohr, ASLA

SBM/sd

cc: MNGRR

Attachment

252\knowlnd3

FLOODPLAIN NARRATIVE

BACKGROUND

The following narrative addresses the standards of Section 14.450.8 of the municipal ordinance. The proposed use for a train track is similar to other circulation/parking uses permitted in this area. The proposal is to place 1,250 feet of track within the A2 Zone.

I. A. The proposed development of the track will not reduce the flood-carrying capacity of Casco Bay, through the design of the track drainage system.

B.

1. Due to the high permeability of the ballast, and the continual connection of the rails to the ties, the lateral movement of any part of the tracks will be minimal to none.

2. The construction of ballast, ties and rails are resistant to flood damage, as floodwaters will pass through or over the track area.

3. Within the 100 year flood line as shown on the plans, there are 2 existing catch basins, that drop into 30" CMP culverts that lead directly to Casco Bay, and one existing 18" CMP culvert. Site drainage above the railroad tracks that lie within the Floodplain typically drains north, away from Casco Bay and the tracks, and flows overland into these existing catch basins and culverts.

4. No water supply or wastewater disposal systems are located within the Floodplain or proposed by this project.

5. No HVAC systems are proposed by this project.

6. This project does not include development or improvements to a structure. No structures are proposed within the Floodplain Zone.

C. No structures are proposed, though the rails and thus the railroad cars are at least two (2) feet above the base flood elevation of ten (10) feet.

D. The position of the ballast and rails will not be affected by hydrostatic and hydrodynamic forces or buoyancy, due to the permeability and weight of the ballast.

E. Three (3) 6" diameter drain pipes have been delineated on the plans to allow for entry and exist of drainage and floodwaters.

F. No manufactured housing park or subdivision is proposed.

G. No housing is proposed.

H. No housing is proposed.

II. The V1-30 flood zone is not located in this area. N/A to this submission.

III.

A. No increase in flood levels to Casco Bay will result from the proposed railroad due to the permeability of the ballast and the placement of drain pipes within the ballast. Floodwaters will not be obstructed by the project.

252\floodnar

M O H R & S E R E D I N
Landscape Architects, Inc.

MEMO TO: **Portland Planning Board**

FROM: **Mohr & Seredin on behalf of the ME Narrow Gauge Railroad & Museum**

DATE: **December 30, 1994**

SUBJECT: **Maine Narrow Gauge Railroad Temporary Use Deadline**

This memo is intended to summarize the issues involved with our request for an extension of the December 31, 1994 termination date regarding the temporary and demonstrational use of the Narrow Gauge Railroad. On behalf of our client, the MNGRR, we respectively petition the Board to move this request for a temporary operating extension until April of 1995 to a public hearing on January 24, 1995.

Our request for an operating extension is based on the following circumstances:

1. The Planning Board's thoughts at the time of approval were to allow operation for sufficient time to permit the general public exposure to the MNGRR. This time span was originally estimated at 2 to 3 months by the Board in their approval deliberations.

2. Due to various delays through-out the fall MNGRR has only been able to demonstrate its operations for the past 3 weeks. Original intentions were to operate for 2 to 3 months so that City officials and the general public could evaluate the train's performance on a protracted basis.

3. To cease operations at this time would be demoralizing both to MNGRR volunteers whom have worked so diligently laying the tracks, and to the businesses that have donated their time, equipment and materials for the construction of the railroad.

4. During the past few weeks, since opening to the general public, the Museum and Railroad has seen tremendous interest as a historic attraction and ridership is on the increase. In turn, the MNGRR has finally begun to generate much needed revenue to assure it's success.

5. MNGRR needs the revenue from the train ridership to continue meeting its financial commitments. The extension would allow MNGRR to continue to gain income from ridership while meeting the demonstration requirements of the Board.

project\252\extend

18 Pleasant Street, Portland, Maine 04101
(207) 871-0003

MAINE NARROW GAUGE RAILROAD COMPANY AND MUSEUM
58 FORE STREET
PORTLAND, ME 04101

May 14, 1997

Melodie Esterberg, P. E., Project Engineer
Portland Public Works Department
55 Portland Street
Portland, ME 04101

Dear Ms. Esterberg:

This letter is to confirm our telephone conversations of this morning. Based on conversation between Paul Sherr and Rick Knowland yesterday, we scheduled crew and machine to line the track at Fish Point this morning. When Paul and I checked the site this morning, Ben Grover told us that he would not permit us do the work today as he had 3 crews that would be working in the area and we would be in the way. He further stated that this was due to having the project "substantially completed" by tomorrow night including the finish paving.

In conversations with you we were under the impression that we would have access to the area this week, and that the paving was scheduled for next week. With the final paving completed tomorrow, we are in effect denied the use of the crawler excavator that we have in site ready to use to line the track and to complete leveling the fill installed for track shoulder. We will now have to use a rubber tired loader to line the track, and wait until dry weather to complete the fill and drainage.

On another matter, with Omni unable even to furnish a sample of the crossing rubber, I have offered the use of the flange strips used at Cutter Street to pave within the rails at "Trail East" crossing. Ben Grover has agreed that this will work. You are also advised that although this crossing has been in informal service for almost 6 months, the city has not yet installed the "passive warning devices" at this crossing in compliance with the DOT order and letter agreement on this crossing.

Please call if you have further insight on these matters.

Sincerely,

J. Emmons Lancaster, P. E.
Superintendent

cc R. Knowland

MAINE NARROW GAUGE RAILROAD COMPANY AND MUSEUM

THE CASCO BAY SHORE SCENIC ROUTE

58 FORE STREET, PORTLAND, ME 04101

(207) 828-0814

January 4, 1997

Mr. Joseph E Gray, Jr., Director
Planning and Urban Development
City of Portland
369 Congress Street
Portland, ME 04101

Attention Richard Knowland

RE: Railroad Construction Schedule

Dear Mr. Gray;

Attached please find the requested construction schedule. Pressures of the holiday season operations have prevented me from getting this to you earlier.

Very truly yours,

Emmons Lancaster
Superintendent

MAINE
NARROW
GAUGE
RAILROAD Co.
&
MUSEUM

58 FORE STREET • PORTLAND, MAINE 04101 • (207) 828-0814

Rick
Let's Discuss

August 14, 1996

Mr. Joseph E. Gray, Jr.
Director of Planning and Urban Development
City Hall
389 Congress Street
Portland, ME 04101

Attention: Richard Knowland

RE: Extension of construction deadline of September 30, 1996

Dear Mr. Gray:

This letter is to request that the date for completion of the track structure of our main line extension to the bridge be extended to November 1, 1996. In conversations with Mr. Knowland regarding our construction plans, we were advised that if we were unable to meet the construction schedule as voted by the board that we should notify you by August 15 of our status and request additional time. This letter is in response to that request.

In June we were fortunate to obtain the services of the National Guard to grade the subgrade from MP 1 at Cutter Street almost all the way to the bridge. Track laying is progressing at a rapid rate currently, with over 1000 feet down of the 2250 feet of main line track to be laid. We still have two passing tracks to complete as well. The India Street siding rail is about 1/3 laid. We expect delivery of an additional 600 track feet momentarily by barge, and have had several other generous rail donations recently.

Ballast deliveries will begin shortly to complete the 1000 feet now down, but additional donations of ballast or transportation will be required to complete the line. Ballast is critical to your acceptance of our work.

A serious problem has manifested itself, in that much of the very hard to get track iron, special bars to fit certain rails and switch slide plates, being very heavy, have attracted the local iron thieves. The loss, and only partial recovery, may substantially hold up completion of the track.

Mr. Joseph E. Gray, Jr. August 14, 1996

The scope and location of the construction of our companion project, the trail, has changed substantially, reducing the urgency of completing the Cutter Street to Bridge portion of the line, where the only construction to be done this year will start at Cutter Street and progress toward India Street. Our present deadline was predicated on total trail construction and under that scenario the September deadline was valid, but there will be no conflict in this area until next year. We were asked by City forces to not construct track in anticipation of their constructing the drainage outfall west of Cutter Street, delaying any extension in fact already started last fall and during the winter.

Our construction schedule has been hampered by the extremely long winter. Heavy snow and rain in the spring effected the date that we were able, under the last extension order, to complete certain portions of Phase 1 before actually starting the track extension. The actual construction did not start until July 1.

We request that the board give favorable consideration to our request and grant a new completion date.

Thank you.

Very truly yours,

J. Emmons Lancaster, P. E.
General Superintendent

cc Melodie Esterberg
Phin Sprague

MAINE NARROW GAUGE RAILROAD COMPANY

INTERIM OPERATING PLAN

GOAL:

To operate 7 days per week through mid-December (18th)

Schedule and Equipment

- Weekdays - Two (2) trains per day using Railbus or Engine #14 and caboose
- Weekends - Three (3) trains per day using Diesel equipment (Possibility of steam December 3 and 4 if approved by Mechanical Department.

Train Departure Times

- Weekdays - 11:00 AM and 2:00 PM (Possibility of later trips if warranted)
- Weekends - 11:00 AM, 1:00 PM, and 2:30 PM (Possibility of later trips if warranted))

Equipment Available

- Locomotive #3
- Locomotive #1
- Locomotive #14
- Railbus
- Handicap Combine #12 (needs handicap equipment, queen post blocks, truss rods, painting and lettering)
- Coach #19 (needs lettering and seats)
- Cars #24 and #25 (ready for service)
- Caboose #553 (needs floor repairs, painting and lettering)

Crews

For December 1994 operations.
Locomotive:

(Identified personnel, not confirmed, not limited to)

Weekends: Hallett, Bradford, Knight, Hall, Campbell, Ashley, Paras

Weekdays: Googins, Lancaster, Bunker

Car Attendants:

(Identified personnel, not confirmed, not limited to)

Weekends: E. MacDonald, J. Rossi, S. Sondheim, B. Thompson, J. Wendt and weekday crew.

Weekdays: W. Leavitt, A. Leavitt, F. Andrews, F. McKay, D. Googins, R. Wilson, J. Wendt, R. Norton, E.B. Robertson, D. Robertson, H. Connell, L. Brown, D. Gordon, J. Gordon, E. Stevens, G. Thompson and others.

Track Inspectors:

Track to be inspected twice weekly; additional inspection as warranted by conditions.

(Identified personnel, not confirmed, not limited to)

J. E. Lancaster, W. Leavitt, G. Small, P. Tracy, A. Houghton, M. Hall, L. Perkins

Ticket Sales:

Ticket sales to be made in museum on temporary basis (plans for later ticket sales booth). Will use separate cash box, one ticket seller to be responsible for daily report.

(Identified personnel, not confirmed, not limited to)

Ticket Sellers: A. Leavitt, D Googins, C. McCracken, other museum personnel.

Hours of Service:

Rest periods and hours work to conform with "Hours of Service Law", maximum of 12 hours, appropriate records to be kept and turned over to General Superintendent.

Duties of Employees/Volunteers

Track Crew

Provide track inspection and repair a minimum of two (2) days per week. Complete necessary reports of inspection and turn over to General Superintendent. Provide response to operating crews for repairs to "soft spots", etc. as needed. Provide additional inspection and repair in cases of flood, heavy rain, extreme high tides, fire, derailments, etc.

Engine Crews

Total fueling, maintenance, operation and inspection within hours of service, Split shifts. Reporting time to be one (1) hour prior to first train for switching service; earlier as required for above. Off duty after put-away and cool down. Furnish and wear traditional engine crew garb. Necessary daily reports to be completed and turned over to General Superintendent.

Train Crews

Car inspection, car cleaning, check first aid kit, assist loading passengers, provide on-car narrative, provide backup signals as required, detrain passengers, punch tickets, count passengers, maintain train sheet. Subject to hours of service. Equipment requirements - furnish and wear traditional "hard hats", dark slacks, light shirts/blouses, suit jackets with shells or buttons, ticket punch, pencil, clipboard, gloves (available), traditional shoes (safety shoes preferred), accurate watch. Report one (1) hour before first train for car cleaning and switching service. Off duty upon train put-away and tie down. Deliver trip records/train sheet to ticket seller. Minimum crew is one (1) crewperson for every two (2) cars.

Ticket Clerks

Check starting cash, check and record starting ticket numbers, check continuity of ticket numbers, sell tickets as required. After last train, record final numbers, balance ticket sales records, set up cash box for following day, contact conductor and complete daily trip and passenger count records, turn in revenue and records as instructed.

NOTE: Funds collected from sale of tickets must be kept separate from museum funds. (This procedure will eliminate any possibility of having to add museum receipts to total revenue subject to revenue sharing provision of State Agreement). These funds are also not to be used as "Petty Cash"; other means to pay for such expenses will be provided.

Accounting and Recordkeeping

Receive cash and original reports from ticket sellers, train crews, track inspection and maintenance crews. Receipts to be deposited promptly into appropriate bank accounts. Check invoices for accuracy and purchase order/authorization, prepare checks for signature as required. Maintain Operating Department accounting system and recordkeeping requirements in accordance with State Agreement. Prepare and forward all necessary reports to MDOT and to Corporate Accountant (R. Wilson) for inclusion in Corporate books. Prepare reports for Board of Directors as required. Maintain safety compliance and training records as required. Co-ordinate with accountant to avoid duplication, to assure that all Operating Department expenses are recorded and/or prorated properly. Provide clerical support to General Superintendent of Operations.

Training

A comprehensive training program is in process. This program will provide training in the areas of safety (OSHA and Agreement requirement), safety of patrons, general railroading, specific job training, compliance issues (Americans with Disabilities Act, Emergency Preparedness, Sexual Harassment), Public Relations.

MAINE NARROW GAUGE RAILROAD AND MUSEUM

OPERATIONS PLAN

October 6, 1993

PREPARE MUSEUM FOR WINTER STORAGE

- Coordinate locations, etc. with D. Fletcher & E. Bickford
- Paint Floor
- Construct Storage Track
- Relocate Equipment Already Inside
- Relocate Outside Equipment to Inside

RAIL

- Training
- Acquisition
  - Locations
  - Quantity
  - Transportation Requirements
  - Removal Crews
  - Loading
  - Transportation
- Installation
  - Fence Relocations
  - Preliminary Grading
  - Additional Material Acquisition (Ties, Spikes, etc.)
  - Field Layout
  - Track Laying

TRAINING

- General Safety Training
  - General Railroad Safety
  - Trackman Safety Program
  - Motor Car Operations Training
  - Trackmans Training (General)
  - Brakeman Training
  - Operating Rules
  - Safety Rules
  - Testing
  - Equipment Operation Training and Qualification

BUILD

- Transfer Table
  - Design

- Survey Layout
- Excavation
- Pit Wall Construction
- Track Laying
- Transfer Table Assembly

- Turntable
  - Site Selection
  - Design
  - Construction
  - Site negotiation

MANAGEMENT PROBLEMS

- Establish Track Inspection Program
- Obtain Track Inspector
- Rules
  - Establish Rulebook (Operating)
  - Establish Rulebook (Safety)
  - Arrange for exams
- Establish Timetable (Employee)
- Establish Passenger Safety Rules
- Ticketing
  - Establish procedures and rates
  - Design Tickets
  - Obtain Tickets
  - Establish Accounting Rules for Tickets
  - Ticket Booth
  - Provide Train Crew Ticket Taking Instructions
- Establish Radio Equipment Network
- Radio Rules
- First Aid
  - Ticket Office
  - Benches
- Establish Monday night training - handouts-attendance list
- Establish Alternate Training Schedule
- Obtain copies of 49CFR for Locomotives and Cars

DISABILITIES ACT CONFORMANCE

- Selection of Disabled Cars
- Provide Wheelchair Ramp
- Wheelchair locks for cars
- Obtain Copy of Law
- Emergency Equipment
- First Aid Box

LOCOMOTIVE ENGINEER CERTIFICATION

- Route

- Air Brake
- Steam Boiler Operations (High pressure license)
- Diesel Electric
- Train Operating Rules
- Daily Inspection Reports

INSPECTION PIT

TARP ON A FRAME

MAINTENANCE
- Equipment (Railroad)

LEASE AND OPERATING AGREEMENT

BETWEEN

STATE OF MAINE

DEPARTMENT OF TRANSPORTATION

AND

THE TRUST FOR THE PRESERVATION OF

MAINE INDUSTRIAL HISTORY AND TECHNOLOGY

CONCERNING

EASTERN PROMENADE TRACKAGE

DRAFT

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AGREEMENT

THIS AGREEMENT is made this day of , 1994, by and between the STATE OF MAINE, acting by and through its Department of Transportation (hereinafter the "DEPARTMENT), and THE TRUST FOR THE PRESERVATION OF MAINE INDUSTRIAL HISTORY AND TECHNOLOGY, a Maine non-profit corporation having a principal place of business at 58 Fore Street, Portland, Maine 04101 (hereinafter called the "TRUST").

WHEREAS, the DEPARTMENT acquired from Canadian National Railway Company on August 30, 1993 certain railroad properties known as the EASTERN PROMENADE TRACKAGE from mile post 0.0 in Portland to mile post 1.74 in Portland (hereinafter referred to as the "Line"); and

WHEREAS, the DEPARTMENT desires to enter into a nonexclusive lease of said Line for the purpose of providing a railroad passenger excursion service; and

WHEREAS, the TRUST desires to lease the Line from the DEPARTMENT for the purpose of constructing and operating only a railroad passenger excursion service; and

WHEREAS, the Commissioner of the Maine Department of Transportation has determined that restoration of rail services on the Line is a service in the public interest; and

WHEREAS, in order to provide for the operation of railroad passenger excursion service by the TRUST on the Line, the parties desire to enter into this Agreement with each other setting forth terms and conditions for the use, management, and operation of the excursion service by the TRUST.

NOW, THEREFORE, in consideration of the foregoing and other good and valuable consideration, intending to be legally bound, the parties do hereby agree as follows:

SECTION I

SUBJECT PROPERTIES AND TERM OF AGREEMENT

SECTION 1.1 Leased Properties. DEPARTMENT hereby leases to the TRUST and the TRUST leases from the DEPARTMENT, for the term of this Agreement for only a railroad passenger excursion service, the Line, as defined above, said Line being more particularly described as railroad rights-of-way situated in the City of Portland, County of Cumberland, State of Maine and as shown on Exhibit A attached hereto and incorporated herein. The leased premises does not presently include any serviceable track or other appurtenances whatsoever situated upon the line. Excepting and reserving to the DEPARTMENT, however, the right to grant trackage rights for use for common carrier rail freight service and related functions, fiber optic rights, and other rights, along the Line. The TRUST acknowledges and agrees that

operation of rail freight service shall have priority over any railroad passenger excursion service.

SECTION 1.2 Rent. The TRUST shall pay the DEPARTMENT rent in the amount of One Thousand Dollars ($1,000.00) per year, payable in full on the first day of each year for the term of this Agreement.

SECTION 1.3 Term of Agreement. This Agreement shall have a term of five (5) years, beginning on the day of the execution hereof and terminating at midnight on the last day of said term, unless earlier terminated in accordance with this Agreement.

SECTION 1.4 Renewal of Agreement. The TRUST shall have a right to renew this Agreement for two additional terms of five (5) years each unless an event of default or other material breach has occurred during the term of the Agreement which (a) was not cured or waived in writing by the DEPARTMENT prior to the end of that term; and (b) was not cured or waived in writing by the DEPARTMENT within the period provided by this Agreement for such default or breach, or, if no such period is otherwise provided, within fourteen (14) days after written notice to the TRUST of such default or breach; and (c) for any given type of default or breach, such default or breach occurred more than a single time without being waived during that term of this Agreement. Failure or election by the DEPARTMENT not to enforce

its rights under this Agreement with respect to any event of default or other breach by the TRUST shall not estop or bar the DEPARTMENT from refusing to renew this Agreement due to such event of default or breach. Renewal of the term shall be automatic unless the TRUST shall have given the DEPARTMENT notice of its intention not to renew no later than sixty (60) days prior to the end of the initial or any renewal term of this Agreement, or the DEPARTMENT shall have notified the TRUST of its ineligibility to renew in accordance with the provisions of this Section.

SECTION 1.5 Utilities. The TRUST shall pay all costs of utilities provided to the Line. The DEPARTMENT shall have no obligation to provide utility services of any kind to the Line.

SECTION 1.6 Taxes. The TRUST shall pay all taxes, assessments, fees and other charges, if any, arising out of or relating to its property and/or its operations on the Line including without limitation those provided for in Section 13.1 hereof.

SECTION 1.7 Condition of Premises. The DEPARTMENT makes no representations or warranties about the condition, quality, or quantity of the leased premises or their fitness for a particular use and by its execution of this Agreement the TRUST represents that it has made its own independent investigation thereof and that it is not relying upon any statement made or

other information presented by the DEPARTMENT or any material provided by the DEPARTMENT.

1.7.1 The TRUST agrees to procure and install ties and rail on the Line, suitable to its proposed operations, to minimum Class I Standards as defined in the DEPARTMENT'S draft rules to be promulgated said rules to be subject to changes at the time of promulgation, under 23 M.R.S.A. §5005, and otherwise in compliance with this Agreement, to be completed on or before April 1, 1995. Serviceable dimension ties shall be laid at a maximum spacing of 24-inches on center. One rail shall be positioned with its gauge side positioned at 28-inches from center of ties. The initial requirements of TRUST are for two foot narrow gauge track, but TRUST agrees to use ties and other appurtenances which are of sufficient size and quality to permit installation of a third rail for standard gauge operations.

1.7.2 The DEPARTMENT may, but shall not be obligated to, make any repairs or perform any maintenance or reconstruction on the Line, including without limitation any bridge or part thereof. The Line leased hereunder includes only the right to operate on property within its boundaries and the DEPARTMENT is under no obligation to provide to the TRUST any rights to interline connections with other railroads; nothing herein shall be construed to bar TRUST from making its own arrangements with third parties for interline connection, provided however all such arrangements or agreements shall be subject to prior written approval by DEPARTMENT.

SECTION II

DESCRIPTION OF SERVICE

SECTION 2.1 Rail Excursion Service. The TRUST agrees to provide rail passenger excursion service on the Line described in Section 1.1. Subject to applicable laws and regulations, all rail passenger excursion service on the Line will be under the exclusive control and operating jurisdiction of TRUST. TRUST will provide, through ownership, lease, contract, or otherwise, all of the necessary locomotives, other equipment and personnel to provide the railroad service hereunder, to be operational by April 1, 1995. TRUST agrees to operate the passenger excursion service in a manner consistent with customers' reasonable needs and with prudent management practices of the industry. TRUST shall plan to provide service to customers at least five times per week (Monday to Sunday) between May 1st and October 31st each year. Failure or delay in service shall not be an event of default where such failure or delay is due to a force majeure and the TRUST has used its best efforts to minimize the duration and consequences of any failure or delay in delivery and has given the DEPARTMENT prompt notice of the occurrence of such a force majeure event.

SECTION 2.2 Train and Engine Crews. The train and engine crew to be assigned to rail service on the Line shall not consist of fewer than two (2) persons without the prior written consent of the DEPARTMENT. Notwithstanding the foregoing

minimum, the TRUST shall have the responsibility to ensure that all rail operations are adequately crewed.

SECTION 2.3 State Rail Passenger Policy. The TRUST shall follow all rules and regulations incorporated in the "Maine Department of Transportation Policy for the Movement of Passengers on State-Owned Railroad Rights-of-Way", a copy of which is attached hereto and made a part hereof, as Exhibit "B".

SECTION 2.4 Quality of Service. The TRUST expressly agrees that as a part of its rail passenger operations it shall provide services including, but not limited to the following: (1) installation of track in accordance with Section 1.7 hereof; (2) the inspection of, and repairs and maintenance to, the track (including the superstructures, track and related components on and along bridges), roadbed, structures, and equipment of the Line (including without limitation all public, private and temporary crossings, but excluding the supporting piers and abutments of bridges on the Line) in accordance with the provisions of this Agreement; (3) inspection, repair and maintenance of the signal systems for the Line (including without limitation all public crossings) in accordance with the provisions of this Agreement; (4) snow removal along the Line as required by the service obligations; (5) clearing of train derailments on the Line within a reasonable length of time; and (6) collection from the appropriate parties of all operating revenues due. As used in this Agreement, the term "bridge"

shall have the meaning set forth in Section 101.08 of the DEPARTMENT's Standard Specifications, Highways and Bridges (Rev. of October 1990).

SECTION III

PAYMENT

SECTION 3.1 Mechanic's/Materialmen's Liens. Subject to the provisions of Section 11.1.7 of this Agreement, the TRUST shall keep the Line free and clear of all liens and encumbrances arising out of or relating to its use, occupation, maintenance and repair of the Line, by payment, bonding or otherwise. The TRUST hereby authorizes the DEPARTMENT to cause to be discharged any such lien or encumbrance and to pay to the claimant or to an escrow agent as security for the claim, as the DEPARTMENT deems appropriate, in the event that TRUST fails to timely remove any such lien, any sums due or claimed to be due for materials or labor furnished to the TRUST, which have given rise to a mechanic's lien. The DEPARTMENT shall be entitled to recover any monies paid to discharge any such lien plus its costs of collection (including attorneys' fees) from the TRUST. The DEPARTMENT shall keep the Line free and clear of all mechanic's/materialmen's liens arising out of its own activities on the Line during the term of this Agreement.

SECTION 3.2 Revenue Sharing. It is the intention of the parties that the DEPARTMENT shall recover from the TRUST the DEPARTMENT's economic investment under this Agreement and that it shall otherwise participate in the revenue generated by the TRUST's operations during the term of this Agreement in recognition of the capital investment in the Line by the DEPARTMENT, which Line is made available to the TRUST under this Agreement. Accordingly, the TRUST shall make payments to the DEPARTMENT as provided in this Section 3.2. To the extent permitted by law, the DEPARTMENT shall endeavor to set aside such funds for future use for railroad or railroad-related purposes.

The payments shall be based upon a percentage of annual operating revenues or annual net operating income ("NOI"), whichever produces the greatest payment to the DEPARTMENT in a given instance. In the event that revenues or NOI derive in part from operations on extensions beyond the Line, they shall be pro-rated in a fair and equitable manner. For purposes of this Section III, revenues, income and expenses of the TRUST shall include all revenues, income, or expenses from any undertaking of the TRUST related to the Line or to rail operations thereon, including without limitation any services provided to facilitate the movement of passengers before or after they travel on the Line, and shall exclude therefrom only those revenues, income or expenses which are derived from or attributable to undertakings entirely independent of and unrelated to the Line and the operations of the TRUST pursuant

to this Agreement. Museum admissions, shop sales, proceeds, pledges and donations, concession receipts, equipment rental proceeds, and other income, shall be included within revenues and NOI subject to revenue sharing. The payments shall be calculated in accordance with Sections 3.2.1 and 3.2.2. Estimated payments based upon the best available data shall be made by the TRUST on or before July 15 and January 15 of each year for the preceding six month period (or part thereof) ending on June 30 and December 31, respectively. A final adjustment in payment shall be made by the parties each year based upon an audit completed in accordance with Section 5.2. The audit shall be completed, and the final adjusted payment made, no later than ninety (90) days after the end of the fiscal year in question (fiscal year being defined as commencing January 1 and ending December 31). In the year preceding the date of the termination of this Agreement, the audit shall be completed and the payment made no later than ninety (90) days after the date of termination. In the event that the final adjustment indicates that the TRUST's estimated payments for the fiscal year in question resulted in an overpayment, the amount of the overpayment shall be refunded to the TRUST by the DEPARTMENT within sixty (60) days after the receipt by the DEPARTMENT of the audit and final adjustment information unless the DEPARTMENT in good faith contests the results of the audit.

3.2.1 Operating Revenue Method. This method of calculation shall be based upon the total annual operating

revenue received by the TRUST for the fiscal year in question. As used in this Section 3.2, the term "operating revenue" shall be defined as set forth in ICC Account 102 at 49 CFR Part 1201 (Passenger), as amended from time to time, which provision includes a specification of items to be credited and items to be charged in calculating operating revenue, and the term further shall include revenue under Section 9.2. The amount payable under this method shall be as follows:

IF	THEN
Total Annual Operating Revenue Is:	Percentage of Total Annual Operating Revenue Paid to DEPARTMENT Is:
$0-300,000	5%
$300,001-500,000	10%
$500,001-750,000	15%
$750,001 and over	25%

In calculating the payment by the TRUST under this Section, it shall be the sum produced by applying the applicable percentage rate for the category into which the total annual operating revenue of the TRUST falls in a given year to the total annual operating revenue. It shall not be the sum produced by applying the different percentage rates to each increment of the total annual operating revenue appearing in the above table.

Provided, however, that in the event that the amount calculated under this Section 3.2.1, if paid to the DEPARTMENT would result, in the judgment of the DEPARTMENT based upon audited financial statements as provided under Section V, in a net operating loss to the TRUST, then the DEPARTMENT shall

reduce the amount which would be payable to the DEPARTMENT under this Section 3.2.1 in an amount sufficient to create net operating income to the TRUST equal to the amount of the reduced amount which would be payable to the DEPARTMENT (see Exhibit C for example). In such case, for purposes of determining whether payment is to be made to the DEPARTMENT pursuant to this Section 3.2.1 or Section 3.2.2, the amount calculated under Section 3.2.1 to be compared to the amount calculated under Section 3.2.2 shall be the abated amount.

3.2.2 Net Operating Income Method. This method of calculation shall be based upon the total annual net operating income received by the TRUST. As used in this Section 3.2, the term "net operating income" shall mean operating revenue as defined in Section 3.2.1 (including revenue under Section 9.2) less reasonable and necessary operating expenses as determined under the "prudent man" rule, but excluding depreciation and interest paid. For purposes of calculating the net operating income hereunder, an amount no greater than $50,000.00, adjusted annually for inflation in accordance with the Consumer Price Index, shall be allowed for the total compensation of all managers, officers and directors of the TRUST. With respect to this cap, the parties understand and agree that the figure contemplates coverage for up to two managers. In the event that the TRUST determines during the term of this Agreement that it is necessary and proper to hire additional managers, then it may request from the DEPARTMENT an increase in the cap and the parties shall negotiate said matter in good faith.

The amount payable under this method shall be as follows:

IF	THEN
Total Annual Net Operating Income Is:	Percentage of Total Annual Net Operating Income Paid to the DEPARTMENT Is:
$0-50,000	10%
$50,001-250,000	20%
$250,001-500,000	30%
$500.001-750,000	40%
$750,001 and over	49%

Any failure by the TRUST to make payments required under this Section 3.2 shall be an event of default. Upon the termination of this Agreement, whether by expiration of its term or otherwise, the TRUST shall remain liable for the payment to the DEPARTMENT of all amounts previously due and payable hereunder plus a pro-rata payment for the part of the year prior to the date of termination. Such payment shall be calculated in accordance with Section 3.2 by projecting the gross revenue and net operating income in that year prior to the date of termination for the full year.

SECTION 3.3 Approvals Required. The TRUST shall obtain and maintain in full force and effect throughout the term of this Agreement all federal, state and local permits and approvals necessary to allow it to operate rail passenger excursion service and to construct trackage on the Line, all as contemplated under this Agreement and including without limitation (to the extent applicable) Interstate Commerce

Commission ("ICC"), Federal Communications Commission ("FCC") and Federal Railroad Administration ("FRA") approvals. With respect to operating authority from the ICC, the TRUST shall apply for any authority required under 49 USC 1091 and 10903 or 49 CFR §1150.21 et seq., as amended from time to time.

SECTION 3.4 Funding Limitation. The TRUST shall have no right, claim, or cause of action against the DEPARTMENT, its officers, employees, or agents for any failure of the DEPARTMENT to provide any funding (there being none contemplated by this Agreement) or any other funding and any such failure shall not constitute a breach of this Agreement by the DEPARTMENT.

SECTION IV

GENERAL MAINTENANCE

SECTION 4.1 General Responsibility. The TRUST shall perform all maintenance of the Line throughout the term of this Agreement. The risk of vandalism of the Line shall be upon the TRUST. The TRUST shall maintain the Line in accordance with the rules promulgated under 23 M.R.S.A. §5005 and this Agreement and in a condition at all times satisfactory to permit safe rail passenger operation in compliance with federal, state and local laws and administrative regulations relating to the operation and maintenance thereof. The DEPARTMENT may enter the Line at any time for the purpose of inspecting the lines to ensure that the TRUST has complied with the foregoing. The DEPARTMENT shall

give telephone notice to the TRUST at (207) 774-1067 or such other number as the TRUST may provide in writing to the DEPARTMENT; provided, however, that if the DEPARTMENT is unable to reach the TRUST after reasonable efforts, its obligation to give notice shall be deemed to have been satisfied.

SECTION 4.2 Crossings. The TRUST shall provide routine maintenance of all highway grade crossings, including protective devices, and of other crossings as provided in Sections 2.4 and 9.2 hereof. Said maintenance shall include all areas between the points lying six inches (6") outside of the end of tie on each side of the right of way of the Line. Nothing in this Agreement shall relieve the TRUST of any of its responsibilities under applicable laws relating to railroad crossings. In addition to crossings provided in Sections 2.4 and 9.2, the parties acknowledge there will be at least two additional crossings by a multi-use trail, said locations to be identified by the Eastern Prom Trail Advisory Committee.

SECTION 4.3 Inspections. Commencing with the granting of a Certificate for Safety under Title 23 M.R.S.A. §7302 the TRUST shall conduct the inspections of the rail facilities as required by the Federal Railroad Administration Track Safety Standards (49 CFR 213, Subpart F, as amended from time to time), and by the rules promulgated under 23 M.R.S.A. §5005 . Upon written request from the DEPARTMENT, the TRUST shall inform the DEPARTMENT of the time and place of any such inspection and

shall permit qualified representatives of the DEPARTMENT to accompany its inspectors. The TRUST shall deliver to the DEPARTMENT within seven (7) days of receipt by the TRUST copies of any "slow" orders applicable to the Line and copies of any affirmative findings indicating a track condition below Class I. The TRUST also shall submit to the DEPARTMENT at the end of each three month period of this Agreement copies of all track inspection reports, including reports from the inspection of all track and superstructures on bridges, for the preceding three months relating to the Line. The TRUST shall include in its reports to the DEPARTMENT any information obtained by or condition observed by its employees or representatives which indicates that any bridge supporting piers or abutments on the Line require maintenance or repair work. Such copies shall be submitted to the DEPARTMENT within thirty (30) days after the end of the applicable three month period. Each inspection report shall specify the date of the inspection, the name of the inspector, the milepost limits of the inspection, the nature and location of all Class I Track Safety Standards defects, the corrective action taken and the date completed. In the event that a defect remains uncorrected for any reason, the TRUST shall explain the reason for not correcting the defect and provide an expected date for the corrective action. Subsequent correction of said defect shall be verified in writing to the DEPARTMENT upon completion. Notwithstanding the foregoing, all maintenance and repair of the Line shall be the responsibility of the TRUST.

SECTION V

ACCOUNTING AND REPORTING

SECTION 5.1 Accounting Records and Practices. The TRUST shall establish and maintain an accounting system covering its activities on the Line authorized under this Agreement. This system will, at a minimum, account for capital investment, revenues, expenditures, gross profit, net profit, and retained earnings in accordance with generally accepted accounting principles. The system shall define revenue in accordance with ICC Account 102 appearing at 49 CFR Part 1201, as amended from time to time. It also will include records of all traffic and revenue for the Line operations and for the sources and uses of cash, and shall account for initial track construction as a separate cost center.

SECTION 5.2 Records Furnished to Department. The TRUST agrees to furnish the DEPARTMENT with copies of any reports of the TRUST's operations filed with the ICC and the FRA within thirty (30) days of such filing. Within 90 days following the end of its accounting year, the TRUST shall provide to the DEPARTMENT audited financial statements. Such statements shall be accompanied by any payment due to the DEPARTMENT under Section 3.2. The audit shall be performed by an independent public accountant in accordance with generally accepted auditing standards issued by the American Institute of Certified Public Accountants and shall cover the corporate entity with

supplemental balance sheet, income and expense statement, a statement of sources and uses of cash and a retained earnings statement covering Line operations that reconciles to the basic corporate financial statements. The TRUST further agrees to make available for inspection and copying by the DEPARTMENT all of its books, records, contracts, reports and other papers, including without limitation all reports and records of the TRUST's operations and traffic volumes, and shall furnish to the DEPARTMENT quarterly reports of passenger volumes and revenues, copies of accident reports, reports of property removed and salvaged, and any other documents, statements or records related to the TRUST's operations which the DEPARTMENT deems necessary. The TRUST also shall require its accountants and its independent public accountant to make their books and records pertaining to the TRUST and/or the work performed for the TRUST available to the DEPARTMENT for inspection and copying upon request. The TRUST shall use its best good faith efforts to obtain the agreement of its contractors, subcontractors and others with whom it does business in the course of performing its obligations hereunder (excluding shipping customers from whom the TRUST does not obtain any materials, services, or supplies) to provide to the DEPARTMENT all records and other information pertaining to the TRUST and/or the work performed for the TRUST necessary to allow the DEPARTMENT to perform an audit. Copies of all documents supplied to the DEPARTMENT under this subsection shall be addressed to the attention of the Director,

Rail Transportation Division at the address specified in SECTION 16.4.1.

SECTION 5.3 Good Standing. The TRUST agrees that the TRUST will pay and discharge when due all of its obligations and liabilities including, without limitation, tax liabilities, except where the same may be contested in good faith. Provided, however, that the provisions of this Section shall not be interpreted to alter the provisions of Sections 3.1 or 11.1.7 of this Agreement.

SECTION VI

REPRESENTATIONS AND WARRANTIES

SECTION 6.1 Department. Subject to the provisions of Section 3.4 of this Agreement, the DEPARTMENT represents and warrants that it has full statutory power and authority to enter into this Agreement and to carry out its obligations hereunder. The DEPARTMENT also represents that this Agreement is subject to the provisions of Title 23 of the Maine Revised Statutes Annotated, as amended from time to time.

SECTION 6.2 TRUST. The TRUST represents and warrants that:

6.2.1 It is a corporation duly organized, validly existing, in good standing and qualified to do business under the laws of the State of Maine.

6.2.2 It has full power and authority to enter into this Agreement and, subject to necessary governmental authority, to carry out its obligations hereunder.

6.2.3 Its execution of and performance to this Agreement do not violate any statute, rule, regulation, order, writ, injunction, or decree of any court, administrative agency or governmental body.

6.2.4 It is financially capable of carrying out its obligations hereunder.

SECTION VII

CONTROL OF LINE

SECTION 7.1 Operations and Access. The TRUST shall conduct its operations in a prudent, businesslike manner, and all revenues derived from railroad passenger operations (except those payable to DEPARTMENT under Section 3.2) shall accrue to TRUST. Except as otherwise provided in this Agreement, all locomotives, trains, cars and other equipment, and all persons entering upon the Line, shall be subject to the reasonable rules, timetables, regulations, and orders of TRUST in effect from time to time and the Rail Passenger Policy of the State of Maine as amended.

SECTION 7.2 Line Records. To the extent that it is able, the DEPARTMENT shall make available at its offices for inspection by the TRUST copies of all valuation and other property maps; track and signal maps; structural, bridge and other drawings and plans; files related to maintenance history, customer data; and any other data related to the continued operation and maintenance of the Line, if any such records are in its possession. The parties hereto acknowledge that such records may contain errors, inconsistencies and outdated information and that the DEPARTMENT makes no representation or warranties about the accuracy or usefulness of any such data.

SECTION VIII

ASSIGNABILITY

SECTION 8.1 Department. The DEPARTMENT expressly reserves the right to assign its rights under this Agreement at any time to any person, government, transportation authority, or other entity by giving notice to the TRUST at least sixty (60) days prior to such assignment date. Such assignment shall be binding upon the TRUST and its successors and assigns, if any are permitted.

SECTION 8.2 TRUST. The TRUST shall not assign or transfer its rights hereunder without the prior written consent of the DEPARTMENT, which consent may be granted or withheld in the sole discretion of the DEPARTMENT. In determining whether to grant

consent to assignment, the DEPARTMENT may consider, without limitation, the financial and operational capabilities of the proposed assignee, the other qualifications of the proposed assignee, the potential impact of the assignment upon rail service and rail passenger service, the financial and other impacts of the proposed assignment upon the interests of the DEPARTMENT and the impact of the proposed assignment upon the public interest as a whole. In the event that such assignment is consented to by the DEPARTMENT, the TRUST shall remain fully liable for the performance of all obligations of the TRUST under this Agreement after said assignment. For purposes of this Agreement, the transfer to or acquisition by any single person or entity of a controlling interest in the TRUST after the date of the execution of this Agreement shall constitute a transfer or assignment hereunder.

SECTION IX

INSURANCE AND INDEMNIFICATION

SECTION 9.1 Liability Insurance. TRUST shall provide and maintain in effect at all times during the term of this Agreement a commercial general liability insurance policy (or other coverage affording equal or greater protection as determined by the DEPARTMENT) which shall be in limits of not less than $2,000,000 per occurrence and $6,000,000 in the aggregate. Such policy shall be in compliance with applicable laws and in a form acceptable to the DEPARTMENT and it shall

include contractual liability coverage for the TRUST's obligations under this Agreement. The policy shall contain provision for deductible no greater than $25,000; provided, that in the event that the TRUST is unable to secure a deductible in such amount or that the cost of insurance with a $25,000 deductible is uneconomic, the DEPARTMENT agrees to negotiate in good faith with the TRUST over a reasonable and prudent increase in the deductible. The TRUST also shall obtain and maintain throughout the term of this Agreement insurance coverage sufficient to meet all of the TRUST's obligations under the Federal Employers Liability Act, as amended from time to time, and shall also obtain and maintain throughout the term of this Agreement insurance coverage sufficient to meet all of the TRUST's obligations for worker's compensation. The TRUST shall deliver certificates of insurance to the DEPARTMENT, executed by an insurance company or companies satisfactory to the DEPARTMENT and licensed by the State of Maine Department of Business Regulation, Bureau of Insurance to do business in the State of Maine, as proof of coverages as required hereunder. The policies shall provide that they shall not be terminated, canceled or materially modified without thirty (30) days' written notice to the DEPARTMENT. The termination, cancellation or material modification of an insurance policy without the prior written consent of the DEPARTMENT shall constitute an event of default under this Agreement.

The DEPARTMENT may require the TRUST to adjust the policy limits set forth above at the time of the renewal of this

Agreement; provided, however, that such adjustment shall be to reasonable amounts not inconsistent with the policy limits found in the railroad industry in similar circumstances.

Each policy with the exception of Worker's Compensation and Professional Liability insurance, shall name the Department of Transportation as an additional insured.

SECTION 9.2 Private and Temporary Crossing Licenses, Construction and Maintenance. The TRUST shall perform all of the DEPARTMENT's maintenance and repair obligations with respect to existing crossing and right of way agreements; all such Agreements known to the Department are listed on Exhibit "C" hereto, and copies thereof have been furnished to TRUST. Revocable licenses to third parties for new utility, temporary and private crossings shall be granted only by the DEPARTMENT, and in such cases the TRUST shall perform all construction work in connection with the said crossings and shall be paid the costs thereof by the licensee. The TRUST shall collect the fees arising out of such licenses and agreements and such revenues shall be included as a part of the TRUST's revenues for purposes of Sections 2.3 and 3.2.

SECTION 9.3 Third Party Agreements. The DEPARTMENT and the TRUST, as applicable, shall require every person entering upon or performing work on the Line under any agreement or license from the DEPARTMENT or the TRUST (hereinafter referred to as "contractor"), including all persons undertaking the

Construction Program and all persons using portions of the Line, to agree to hold harmless and indemnify the DEPARTMENT and the TRUST, their officers, agents, servants, and employees from and against any liability, loss, claims or expense for injury (including death) to any person or damage to any property (including property of or under the control of TRUST or DEPARTMENT) arising out of any act or omission of such contractor. The DEPARTMENT and the TRUST, as applicable, shall also require any such person to secure and maintain in effect at all times during the performance of such work on the Line insurance coverages including railroad protective liability insurance and contractual liability insurance covering such contractor's obligations to the TRUST and the DEPARTMENT.

SECTION 9.4 Indemnification of Department. The TRUST covenants and agrees to indemnify and hold the DEPARTMENT, its officers, agents, servants and employees harmless from and against any and all liability, claim, loss, cost, damage and harm asserted by any third parties, including attorneys' fees and other expenses and costs of litigation, arising out of or relating to (a) this Agreement; (b) the performance of this Agreement; and (c) the use and occupation of the Line by the TRUST, its officers, agents, servants, employees, invitees, licensees, sublicensees, lessees and its contractors and subcontractors; including without limitation to the foregoing any liability for any losses arising from injury (including death) to persons or damage to property, including the Line,

which arises out of or is in any way connected with the Line and which is caused in whole or in part by any act or omission of TRUST, its officers, agents, servants, employees, invitees or licensees. The foregoing indemnification obligation of the TRUST shall exclude the negligent acts of the DEPARTMENT's employees and its agents.

SECTION X

MODIFICATIONS AND IMPROVEMENTS

SECTION 10.1 Consent Required. Prior to making any improvement other than normal maintenance to the Line, the TRUST shall submit a plan of work to the DEPARTMENT and obtain consent from the DEPARTMENT for such work. All personal property installed as improvements or during maintenance to the Line shall become part of the Line (subject to the provisions of Section 10.3 hereof) and the property of the TRUST upon being affixed to or installed upon the Line. In the event the DEPARTMENT determines an expansion of rail passenger excursion service is in the public interest then the DEPARTMENT shall consult with TRUST and together they shall amend this Agreement as required to permit such expansion.

SECTION 10.2 Relocation. The TRUST may, with the consent of the DEPARTMENT, from time to time relocate its tracks on the Line. The cost of materials and construction for relocation shall be borne by the TRUST. That portion of any such

relocation which is located upon the Line shall become a part thereof upon installation.

SECTION 10.3 Removal. In the event of the termination of this Agreement, the TRUST shall have the right (to be exercised by the TRUST within 90 days of the effective date of any such termination) to remove any track (including rail, ties and other track materials), track accessories, structures and other appurtenances installed by TRUST on the Line (excepting any such items which are furnished by the Department), as the personal property of the TRUST. Prior to removal, the Department shall have the right to purchase such property and improvements from the TRUST, at the net salvage value of such track materials and appurtenances.

SECTION XI

EVENTS OF DEFAULT

SECTION 11.1 Specific Events. The following shall be Events of Default under this Agreement:

11.1.1 Subject to Section XV, failure (after April 1, 1995) of TRUST to provide rail passenger excursion service on the Line for at least 180 consecutive days for any calendar year during the term of this Agreement.

11.1.2 Failure to obtain written consent of DEPARTMENT as required by any section of this Agreement.

11.1.3 The occurrence of any event identified by any section of this Agreement as an event of default.

11.1.4 Breach by the TRUST of any provision of this Agreement which is not separately specified as an event of default, which breach remains uncured for more than thirty (30) days after written notice of such breach to the TRUST (subject to the provisions of Section XV with respect to obligations under Sections 2.1 and 2.3 of this Agreement); provided, however, that such written notice of the breach shall not be required in the case of a failure by the TRUST to make payments required under this Agreement and such failure shall constitute an event of default.

11.1.5 The termination by the ICC or the FRA, if applicable, of the TRUST's right to operate on the Line or any part thereof.

11.1.6 The filing of a petition for bankruptcy, reorganization or arrangement of TRUST pursuant to the Bankruptcy Code or any similar proceeding, where such proceeding is not dismissed within ten (10) days after its initiation.

11.1.7 Failure by the TRUST to discharge or remove within thirty (30) days of filing any mechanic's or materialmen's liens arising out of or related to the TRUST's use, occupation, construction, or maintenance of the Line.

11.1.8 The transfer of any interest in this Agreement by the TRUST or of any interest in the TRUST in violation of the terms of this Agreement, or the entry into any contract by the TRUST which violates the provisions of Section 16.3 of this Agreement.

11.1.9 Failure by the TRUST to give any notice required under this Agreement.

11.1.10 Failure by the TRUST to comply with any provision of Section XIV hereinbelow.

SECTION XII

TERMINATION

SECTION 12.1 Events of Termination. This Agreement shall terminate upon the occurrence of any of the following events:

12.1.1 The expiration of the initial or any renewal term of this Agreement.

12.1.2 Notice of termination from the DEPARTMENT to the TRUST based upon the occurrence in the judgment of the DEPARTMENT of an event of default as defined in SECTION XI.

12.1.3 Either party is prevented from honoring its respective commitments under this Agreement as a result of legislative, judicial, or other governmental action, including the denial (but not the revocation or non-renewal) of approvals for the TRUST's operations as contemplated hereunder, where such action is the result of circumstances not within the control of the terminating party and the terminating party provides thirty (30) days notice of such termination to the other party.

Termination of this Agreement under this Section shall entitle the DEPARTMENT to possession of the Line, to end the right of TRUST to provide rail passenger excursion service hereunder. This provision shall not constitute a limitation upon the rights or remedies otherwise available to the DEPARTMENT, nor shall it be deemed to be intended to benefit any other party.

In the event of termination of this Agreement by the DEPARTMENT, the DEPARTMENT shall have the right to terminate the TRUST's operations on the Line immediately upon notice to the TRUST. In connection therewith, by its execution of this Agreement the TRUST appoints the DEPARTMENT as its attorney in fact to file on its behalf with the ICC, the FRA and any other regulatory agency any necessary request to terminate service on

the Line in the event of a termination of this Agreement under this Section XII.

All contracts between the TRUST and third parties relating to the Line shall contain a provision notifying the third party of the DEPARTMENT's rights to terminate service under this Agreement. No third party shall have any claim or cause of action against the DEPARTMENT arising out of or relating to the exercise by the DEPARTMENT of its rights and duties under this Agreement.

SECTION XIII

TAXES

SECTION 13.1 Tax Liability. In the event that taxes are assessed by any taxing jurisdiction authorized to assess and/or collect ad valorem taxes against the Line, including right-of-way and other lands and improvements, then TRUST shall pay such taxes when due and payable. This provision and any such payment shall not constitute a waiver of any right of the TRUST to contest the assessment of such tax, or to assert the tax-exempt status of TRUST.

SECTION XIV

ADDITIONAL OBLIGATIONS OF TRUST

SECTION 14.1 Compliance with Laws. The TRUST agrees to perform the rail passenger excursion service work pursuant to this Agreement in compliance with all applicable federal, state and local laws, regulations and administrative policies. This shall include without limitation the State of Maine Rail Passenger Policy, compliance with the requirements of the Clean Air Act (42 USC 18570-9), the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC 9601 et seq.), the Resource Conservation and Recovery Act (42 USC 6901 et seq.), the Federal Water Pollution Control Act (33 USC 1318), the Maine Uncontrolled Hazardous Substance Site Law (38 M.R.S.A. §1361-§1371), 23 M.R.S.A. §5005, all as amended from time to time, and all of the regulations issued thereunder. The TRUST will notify the DEPARTMENT of the receipt of any communication indicating that the TRUST has not complied with such laws or regulations, including without limitation providing the DEPARTMENT with a copy of any notice from the Environmental Protection Agency and/or the Maine Department of Environmental Protection, which indicates that the Line is under consideration for inclusion on the Environmental Protection Agency's or the Maine Department of Environmental Protection's list of violating facilities.

14.1.1 All costs and penalties relating to any contamination requiring clean-up under federal or state solid or hazardous waste law caused or contributed as a result of the TRUST's operation shall be the responsibility of the TRUST.

14.1.2 The TRUST shall not infringe, impact or prejudice the ability of the DEPARTMENT to contribute air emissions or pollutants within the same air quality planning area.

SECTION 14.2 Alteration of Business Organization. Except as otherwise required by law, the TRUST shall not, prior to termination or expiration of this Agreement, liquidate, dissolve, merge, consolidate or change the form of its business organization without the consent of DEPARTMENT; provided, however, that the DEPARTMENT shall consent to any such change which in the DEPARTMENT's sole judgment will not materially impair the TRUST's ability to perform its obligations under this Agreement and will not have any other adverse impact upon the public interest.

SECTION XV

FORCE MAJEURE

SECTION 15.1 Interruption of Service and/or Construction. The TRUST shall be relieved of its obligation to operate over

any portion of the Line and to perform any required construction work to the Line to the extent that, and so long as, it is prevented or hindered therefrom by acts of God, public authority, strikes, riots, labor disputes. In any such event, TRUST shall immediately confer with DEPARTMENT to arrange for assessment of any damages to the Line, any impact on service and future operation and any impact upon the construction program, as well as the TRUST's plans for the restoration of service and/or resumption of the construction work. At its option, DEPARTMENT may terminate this Agreement if it determines in its sole discretion that such interruption and the TRUST's proposed response do not meet the intent or purpose of this Agreement.

SECTION XVI

MISCELLANEOUS

SECTION 16.1 Entire Agreement. This Agreement expresses the entire agreement between the parties and supersedes all prior oral or written agreements, commitments, or understandings with respect to the matters provided for herein, and no modification of this Agreement shall be binding upon the party affected unless set forth in writing and duly executed by the parties hereto. Provided, however, that this Agreement shall not affect the independent powers, duties, or jurisdiction of other agencies or instrumentalities of the State of Maine.

SECTION 16.2 Antidiscrimination Clause. The TRUST hereby agrees to abide by all rules and regulations related to the Americans With Disabilities Act of 1990, and to observe and comply with the following during the term of this Agreement: no person shall on the ground of race, color, national origin, disability, or sex be excluded from participation in, or denied the benefits of, or be subject to discrimination under, any project, program, activity or service provided under this Agreement, except as authorized by applicable state and federal law. The following specific discriminatory actions are prohibited:

16.2.1 The TRUST shall not, directly or through contractual or other arrangements, on the ground of race, color, creed, national origin, disability or sex, except as authorized by law:

(A) Deny a person any service, financial aid, or other benefit provided under this Agreement.

(B) Subject a person to segregation or separate treatment in any matter related to his or her receipt of any service.

(C) Deny a person the provision of services or otherwise, or afford him or her an opportunity to do so which is different from that afforded others.

(D) Discriminate against any employee or applicant for employment because of race, color, creed, national origin, disability, or sex. TRUST shall take affirmative action to insure that applicants for employment are employed, and that employees are treated during employment without regard to their race, color, national origin, disability, or sex. Such action shall include, but not be limited to, the following: employment, promotion, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

(E) Discriminate against any business organization in the award of any contract because of its race, color, creed, national origin, disability, or sex of its employees, managers, or owners.

16.2.2 The enumeration of specific forms of prohibited discrimination does not limit the generality of the foregoing.

16.2.3 The TRUST agrees to notify DEPARTMENT promptly of any lawsuit or complaint filed against it alleging discrimination on the basis of race, color, creed, national origin, disability, or sex.

SECTION 16.3 Prohibited Interests. The following acts shall be prohibited:

16.3.1 Neither the DEPARTMENT nor the TRUST nor any of its contractors or their subcontractors shall enter into any contract, subcontract, or arrangement in connection with this Agreement, or with any property included or planned to be included, in the Agreement, in which any member, officer or employee of the DEPARTMENT during his tenure, or for one year thereafter, has any interest, direct or indirect.

16.3.1.1 If any such present or former member, officer, or employee involuntarily acquired, or had acquired, prior to the beginning of his tenure any such interest, and if such interest is immediately disclosed to the DEPARTMENT and such disclosure is entered upon the public records of the DEPARTMENT, the DEPARTMENT may waive the prohibition contained in Paragraph (A) above. No such present member, officer, or employee shall participate in any action by the DEPARTMENT relating to such agreement, contract, or arrangement.

16.3.1.2 No member, officer, or employee of the DEPARTMENT during his tenure or for one year thereafter shall have any interest direct or indirect, in this Agreement or the proceeds thereof.

16.3.2 The TRUST shall not contract directly or indirectly, for services, materials, equipment, or supplies to be used in the performance of this Agreement or any part hereof with: any person who is an officer, director, employee, or shareholder of the TRUST; or with any firm, partnership, corporation, or other entity which the TRUST, or its officers, directors, employees, or shareholders, or any one of them, owns or controls in whole or in part (including without limitation any corporation in which the TRUST's officers, directors, employees, or shareholders, or any one of them, is an officer, director, employee, or shareholder); or with any person, firm, partnership, corporation, or other entity which holds any ownership or controlling interest in the TRUST or who, directly or indirectly, holds a position in the management of the TRUST, including without limitation any stockholder, employee, officer, or member of its board of directors. The above prohibitions also shall apply to any relative by blood or marriage to the enumerated persons. This provision may be waived by the DEPARTMENT only in writing and only following a written disclosure by the TRUST to the DEPARTMENT of all facts relating to such proposed transaction.

16.3.3 The TRUST shall comply at all times with the provision of Section 20 of the Clayton Act, as amended from time to time.

SECTION 16.4 Notices. All notices, demands, requests or other communications which may be or are required to be given, served or sent by either party to the other pursuant to this Agreement shall be in writing and shall be deemed to have been properly given or sent:

16.4.1 If intended for the DEPARTMENT, by mailing by registered or certified mail, return receipt requested, with postage prepaid, addressed to the DEPARTMENT at:

Maine Department of Transportation
Transportation Building
State House Station #16
Augusta, Maine 04333-0016
Attention: Director
Rail Transportation Division

16.4.2 If intended for the TRUST, by mailing by registered or certified mail, return receipt requested, with postage prepared, addressed to the TRUST at:

Phineas Sprague, Jr., President
The Trust for the Preservation of
Maine Industrial History and Technology
58 Fore Street
Portland, Maine 04101

with a copy to:

J. Emmons Lancaster
666 Dutton Hill Road
P.O. Box 377
Gray, Maine 04039-0377

Each party may designate by notice in writing a new address to which any notice, demand, request or communication may thereafter be so given, served, or sent. Each notice, demand, request or communication which shall be mailed by registered or certified mail (unless otherwise agreed) to either party in the

manner aforesaid shall be deemed sufficiently given, served or sent for all purposes at the time such notice, demand, request or communication shall be either received by the addressee or refused by the addressee upon presentation.

SECTION 16.5 Covenant Against Contingent Fees. The TRUST warrants that it has not paid or agreed to pay to any company or person any fee, commission, percentage, brokerage fee, gifts, or any other consideration contingent upon or resulting from the award or making of this Agreement. For breach or violation of this warranty, the DEPARTMENT shall have the right to terminate this Agreement without liability to the TRUST or other persons.

SECTION 16.6 Notification of Leases and Loans. The TRUST represents to the DEPARTMENT that as of the date of the execution of this Agreement there exist no agreements for the financing, purchase, lease or other mode of acquisition of locomotives, cars, highway vehicles, track maintenance equipment, real property and/or improvements to real property for use on the Line, other than as disclosed in writing to the Department on the attached Exhibit D. The TRUST shall give notice to the DEPARTMENT of any such agreement(s) concluded during the term of this Agreement within sixty (60) days after the signing of any such agreement(s) and shall make any such agreement(s) available to the DEPARTMENT for inspection and copying upon its request.

SECTION 16.7 Binding Agreement. This Agreement shall be binding upon and inure to the benefit of DEPARTMENT, its successors and assigns, and to the TRUST its successors and assigns, if any are permitted.

SECTION 16.8 Enforcement. If the TRUST breaches its duty to operate rail passenger excursion service pursuant to this Agreement, the parties agree that damages may not provide an adequate remedy, and that in addition to any damages remedy, the DEPARTMENT may seek specific performance of such obligations in any court of competent jurisdiction.

SECTION 16.9 Severability. If fulfillment of any provision hereof or any transaction related hereto shall involve transcending the limit of validity prescribed by law, then the obligation to be fulfilled shall be reduced to the limits of such validity; and if any clause or provision herein contained operates or would prospectively operate to invalidate this Agreement in whole or in part, then such clause or provision only shall be held ineffective, as though not herein contained, and the remainder of this Agreement shall remain operative and in full force and effect.

SECTION 16.10 Waiver. No waiver of any term or condition hereof shall be valid unless in writing and signed by the party to be charged with the waiver. No failure or delay in enforcing any right or obligation hereunder shall be deemed a

waiver of such right or obligation or of any other right or obligation under this Agreement.

SECTION 16.11 Right of Entry in Emergencies. In the event that the TRUST fails or refuses to undertake immediately, or to work steadily to complete thereafter, any work necessary to cure any defect in the Line for which the TRUST has a maintenance and repair obligation that the DEPARTMENT in its sole discretion determines presents a threat or danger to public health or safety, then the DEPARTMENT may, but has no obligation to, enter upon the Line to cure the same. In such event, the DEPARTMENT shall attempt to give notice of such entry to the TRUST by telephone at (207)774-1067. The DEPARTMENT shall be entitled to recover from the TRUST the costs and expenses of such undertaking, whether by offset against amounts payable under this Agreement or otherwise.

SECTION 16.12 Headings. Article headings used in this Agreement are inserted for convenience of reference only, and shall not be deemed to be part of this Agreement for any purpose.

SECTION 16.13 Obligations Upon Termination. The termination of this Agreement, by expiration or otherwise, shall not extinguish the rights of the DEPARTMENT to recover sums due under the terms of this Agreement nor shall it extinguish any action for breach or damages to which the DEPARTMENT may otherwise be entitled.

SECTION 16.14 Governing Law. This Agreement shall be governed and construed in accordance with the laws of the State of Maine.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and attested by their duly authorized representatives on the date and year first above written.

THE TRUST FOR THE PRESERVATION
OF MAINE INDUSTRIAL HISTORY
AND TECHNOLOGY

_____ By_____
Witness Phineas Sprague, Jr.
President

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

_____ By_____
Witness Dana F. Connors
Commissioner

GUARANTY

For valuable consideration received, the receipt and sufficiency of which is hereby acknowledged, the undersigned _____, and _____, jointly and severally, hereby guaranty the performance by _____ of all of its obligations under the above Lease and Operating Agreement and agree to indemnify and hold harmless the STATE OF MAINE, acting by and through its DEPARTMENT OF TRANSPORTATION, from any loss, cost, damage, or harm arising out of or relating to the breach of any part of said agreement.

Any deviations from additions to, or modifications in the obligations of the MAINE _____ under said Agreement may be made without the consent or knowledge of the undersigned and without in any way releasing the undersigned from liability under this Guaranty.

IN WITNESS WHEREOF, the undersigned have executed this Guaranty this _____ day of _____, 1994.

_____ _____
Witness

_____ _____
Witness

_____ _____
Witness

_____ _____
Witness

PB REPORT #30-94

MAINE NARROW GAUGE RAILROAD COMPANY
TRACKAGE DEVELOPMENT

VICINITY OF INDIA STREET AND EASTERN PROMENADE

MAINE NARROW GAUGE RAILROAD COMPANY AND MUSEUM, APPLICANT

Submitted to:

Portland Planning Board
Portland, Maine

June 28, 1994

I. INTRODUCTION

Maine Narrow Gauge Railroad Company requests site plan review for the installation of temporary railroad trackage from India Street and Commercial Street to Fish Point. The proposed trackage will be located within the former Canadian National Railroad right-of-way. The proposed development is subject to Site Plan and Shoreland Regulation Standards. For site plans, background information and updated submissions, see Attachments A, B, C.

On November 9, 1993, site plan review was granted for the Narrow Gauge Museum, subject to a series of conditions. One of the conditions states that "any expansion of the museum use or development of any trackage, shall required site plan approval." The submitted site plan is a revision to this earlier plan.

530 notices were sent to area residents.

II. FINDINGS

Zoning: Waterfront Special Use Zone, Waterfront Port Development Zone, Recreation and Open Space Zone

Land Area of Corridor: .93 acres (area occupied by train tracks)

The applicant wishes to install 3,400 linear feet of train tracks on a temporary basis from the corner of India Street and Commercial Street to approximately Fish Point. This is intended to be the first phase of a track line which will eventually extend to Tukey's Bridge. At this point, a single set of tracks is proposed.

As the Board is aware, the City has undertaken a study to develop a plan for the proposed Eastern Prom walkway which will run from India Street to Tukey's Bridge. This effort will result in a design plan for the walkway including provisions for the narrow gauge railroad. Carefuly planning is critical since this open space corridor will need to accommodate a variety of uses. The plan which is being overseen by the Eastern Prom Trail Advisory Committee with Terrence DeWan Associates serving as the consultant, has not been completed. The plan will be finished in September.

On June 15, 1994, the Historic Preservation Committee voted 6-0 (Thaxter absent) to recommend to the Portland Planning Board approval of the Maine Narrow Gauge Railroad application for a Certificate of Appropriateness. The approval reads "the recommendation is for installation of 600 feet of railroad track with ballast at the base of Fort Allen Park , within the Eastern Promenade Historic Landscape District. The recommendation was based on the understanding that the project is a temporary installation only; final track alignment, width of ties, and other aspects of the installation are subject to change once comprehensive planning for the Eastern Prom Trail Corridor is completed." (See Attachment D.)

At the June 9, 1994 Friends of the Parks Commission meeting, the Commission voted (8-0) that the Narrow Gauge proposal for trackage (temporary or otherwise) should not be installed until the Eastern Prom trail master plan has been completed.

Memos from Natalie Burns, Associate Corporation Counsel, regarding a summary of the draft MDOT agreement with Maine Narrow Gauge Railroad and the Board's review authority for the railroad proposal are shown as Attachment E and F.

Railroad Construction Cross-Section

Attachment A-1 to A-4 indicates the proposed location of the railroad line. The setback distance of the trackage center line from the edge of the MDOT corridor is shown as on these plans. Generally the trackage is set as close as possible to the landward side of the MDOT corridor except for the first 400 from India Street where the rail line is on the BIW (waterside) side of the corridor.

A typical cross-section of the trackage is shown as Attachment . Six to eight inches of 3/4 inch gravel would serve as the ballast for the trackage. Eight foot long railroad ties would be installed within the gravel at a height of about ten inches above the existing grade of the MDOT corridor. Trackage would be installed on top of the ties.

The applicant plans to use a regular train track design standard rather than the narrow gauge/two foot standard. Should the MDOT find it necessary (at a later date) to provide regular train service over this railroad bed, a third rail could be added accommodating a regular size train. The implications of this are that larger ties (five feet versus eight feet) and railroad beds are required. These factors tend to decrease the amount of available space within the right-of-way for pedestrians, bike trail users and landscape/open space amenities within the corridor.

The Eastern Prom trail/greenbelt represents a very unique open space resource. The trackage should be sited and constructed to maximize the amount of open space directly contiguous to the walkway and the shore.

The draft lease between MDOT and the applicant, which is currently under review by the City, specifies an eight foot tie (rather than a five tie for a narrow gauge line). Concern has been expressed about this provision. (See Attachment G.)

A possible compromise would be to have the full length of the ballast (ten feet) installed and hold off installing the full length ties until (if ever) there is a need to add a third rail.

Rail Crossings

There are a number of rail crossings required for this project. At least one Eastern Prom trail crossing will be required (roughly near the proposed Community Health Services parking lot) to get the trail on the waterside of the shore after initially starting on landside from India Street. A cross-section of the proposed rail crossing is shown as Attachment B-90.

The City of Portland is interested in reserving several rail crossings adjacent to City-owned land near India Street and BIW (see Attachment H). In a letter to MDOT, Thomas Valleau, Director of Waterfront and Transportation Facilities, has requested two easements, each 100 feet in length. Later, Mr. Valleau indicated that as an alternative four 50 foot corridors would be desirable. The granting of these rail crossings would preserve BIW crossing rights, as well as any other future access needs across the tracks. Presently, BIW has a pedestrian walkway and a vehicular access-way crossing the proposed trackage. The site plan states that these crossings will be constructed by the N.G.R.R. Co.

The site plan indicates that two 50 foot wide crossings adjacent to the Portland Yacht Services property (see Attachment A-3). These crossings will service the water access needs of Portland Yacht Services. The rider embarking/debarking zone is adjacent to the most easterly of the rail crossings. See Attachment I.

Temporary Trackage and Track Placement

Attachment B-5 defines "temporary". This section states "the first phase of track placement has been defined as "temporary" track placement due to MNGRR'S commitment to full comply with the E.P.T.A.C. master plan. "Temporary" has been used to define the location, not the length of time in services or duration of activities. MNGRR has agreed to shift the track alignment either vertically or horizontally to make the overall corridor as appropriate to bicyclists and pedestrians, as it will be to the train riders".

Since there is a gap in time between the current trackage proposal before the Board and the September completion date of the Eastern Prom Trail master plan, the Board should consider a condition of approval that features a time limit of track use; Board review of a revised site plan for compliance with the trail master plan; and a deadline for removal and or completion of the trackage including related amenities in compliance with the Planning Board approved revised site plan.

Temporary means temporary but physical improvements to property often become permanent. The applicant is proposing a one-half mile rail corridor with hundreds of ties and considerable quantities of gravel. The applicant has made numerous assurances that the trackage is temporary. The applicant is confident that the proposed location of tracks will be acceptable when the master plan is complete. The track layout appears to be in a logical location at this point but the final judgement of that has not been made in the trail master planning process.

Location is one element but the appropriate elevation and grade of the trackage and the trail is another unknown variable at this point. Appropriate improvements, such as trail rail crossings and related safety elements; safety barriers and other amenities between the rail and trail that relate directly to the impact of the train have not been figured out yet. Clearly there are many planning elements that will not be known until the master plan has been completed.

There are several options in dealing with a physical improvement that are characterized as temporary.

OPTION ONE: Install tracks in a very temporary location.

One option would be to have the applicant install trackage in an area of the trail that we know will not be a future footprint for the tracks. This would emphasize the temporary nature of the trackage and require that the improvements be moved to the appropriate location when the master plan has been completed.

OPTION TWO: Applicant's proposal.

The second option would be to install the temporary trackage in the proposed location with construction cross-sections submitted by the applicant.

OPTION THREE:

The third option would be to install the temporary trackage with the most up to date analysis and concepts developed by the trail master plan consultant. Sarah Marshall, of Terrence DeWan Associates, will be submitting some concept sketches that illustrate important trail planning elements that have been developed to date. These are helpful, but again the planning process has not been completed (see Attachment I). We also have some other material that has been developed by the consultant for the trail project.

OPTION FOUR:

Approve a lesser length of tracks incorporating any of the above options.

OPTION FIVE:

The other option might be to table consideration of the site plan until more of the master plan has been completed.

Financial and Technical Capacity

Financial and technical capacity is outlined on Attachment B-9. The applicant indicates that a majority of the material for the track construction, have been donated or will be donated. The applicant has all the ties and rail in their possession. Volunteer labor will install the trackage.

Sec. 14-525(c)(9) requires that "evidence of financial and technical capacity to undertake and complete the development including, but not limited to, a letter from a responsible financial institution stating that it has reviewed the planned development and would seriously consider financing it when approve, if requested to do so." Further documentation to meet this requirement should be submitted by the applicant.

Air Emissions

Air Emissions information is summarized on Attachment B-7 with detailed analysis starting on Attachment B-25.

The railroad intends to operate 4 to 5 trains per day. The locomotives are powered by coal and diesel. The diesel locomotive will be utilized for the majority of the 30 to 35 weekly trips. The steam locomotive will be used 2 to 3 days a week for 2 to 4 of the runs. Under no circumstances will the steam engine be used for more than 40% of the trips, regardless of the total number of weekly excursions. The train will have between 2 and 8 cars attached to the locomotive.

Concern has been expressed about the environmental and health effects of coal and diesel fuels. Some have suggested that the locomotive boilers should be converted to natural gas. Obviously, a very direct concern is the impact of emissions on air quality adjacent to the trail and the neighboring area. A train is a form of transportation and is exempt from DEP regulations. However, stationary objects are regulated and according to the analysis of Susan Romatzick of Paladin Environmental (see Attachment B-43), diesel and coal-fired engines of the Narrow Gauge Railroad will not exceed Maine's Ambient Air Quality Standards for stationary objects. According to Ms. Romatzick, these standards are "intended to protect the weakest and most vulnerable individuals."

See Attachment J for memo from Development Review Coordinator.

Noise

Noise generating activities from the proposed train use will be limited to sound occurring as a result of the operation of the train engine and use of the train whistle. The train's hours of operation will be limited to between 10:30 a.m. and 7:30 p.m., and the train will be utilized for a maximum of five (5) trips during that period. For each trip, the train will be using the whistle for a short (one to three seconds) blasts when departing and arriving.

The applicant states (see Attachment B-12) that small train engines such as the diesel and engines owned by MNGRR generate sound levels of 35 to 45 decibels at rest, and 55 to 75 decibels when operating (both measured 50 feet from the source). Whistles operate in the sound range of 60 to 90 decibels, dependent upon whistle type add purpose. (Handbook of Urban Rail Noise and Vibration Control).

The Waterfront Special Use Zone Noise Standard requires that generated noise within this zone may not exceed fifty-five (55) decibels at or within the boundaries of a residential zone. [There is an exception for emergency situations.] Although the applicant states that the MNGRR will comply with the noise standards of the Waterfront Special Use Zone, documentation has not been provided to this effect. Staff was originally hoping to do a sound measurement of the train's whistle prior to Tuesday's meeting. Unfortunately, due to logistical issues, this will not be possible. Staff can conduct this measurement at a later date to verify compliance with the noise standard. Noise measurement of the whistle could be a condition of approval.

Responsibility of Track Crossings and Amenities

The applicant has indicated that they will install gravel track crossings. But the site plan is not clear whether the MNGRR accepts responsibility for other safety-related amenities. We have requested a clarification from the MNGRR on this issue. MNGRR should be responsible for all costs of the trackage including all trail crossings and other elements relating to the impact of the railroad on the Eastern Prom trail. For example, the master plan may recommend certain barriers or buffers between pedestrians and the tracks, special rail crossing elements, such as signs or flashing lights. These are elements that help mitigate the impact of the train to the trail and provide for an appropriate measure of public safety.

III. STAFF REVIEW

This proposal has been reviewed by staff for conformance with the review criteria of the Site Plan (sec. 14-526) and Shoreland Regulations (Sec. 14.446).

Site Plan Review

1/2. **Traffic**

The path of the train tracks and rail crossing issues are discussed in other sections of this report.

Vehicle access to the site will be from the Fore Street driveway into the Portland Engineering complex. The MNGRR Museum has been previously approved and includes 20 parking spaces. According to the applicant (see Attachment B-8).

> Parking for train ridership is estimated at approximately 15-30 parked cars at one time during a weekday, and 30-60 parked cars during weekends. Special events, such as rail fair, may attract up to 60-90 parked cars, at one time. The Portland Engineering Company complex has the capacity to hold these projected numbers based on the existing parking layout. See Parking Distribution Diagram for the Portland Engineering site.

The Rider Embarkment/Debarkment Zone has been designated on the site plan, Drawing #3. Pedestrian circulation has been painted from the Museum to the car storage yard and has been successfully used this spring. An additional crosswalk leading to the Embarkment/Debarkment Zone will be painted following plan approval.

The original museum site plan included a series of painted walkways in the middle of the parking lot. A portion of this walkway followed the footpath of an existing railroad track. A condition of the original museum approval was that "the pedestrian circulation and walkway plan on the site shall be subject to further review and approval by Planning staff and City Traffic Engineer. The plan shall also be further reviewed by Planning staff and the City Traffic Engineer within one year from now."

It is recommended that the painted crosswalk within the abandoned railroad track be eliminated and that a sidewalk be created along the southerly face of the museum with a timber guardrail to protect pedestrians from parking cars. Also a timber guardrail or some other device should be installed for a painted walkway directly to the east of the museum to protect pedestrians from parked autos.

The temporary use of the tracks will allow an opportunity to monitor the traffic and parking demand of this use. It "recommended that a traffic and parking analysis be conducted when the permanent railroad proposal comes back to the Board for site plan review.

3. **Proposed Structures and Uses**

Not applicable.

4. **Bulk, Location, Height of Structures, minimizes any substantial diminution in the value or utility to neighboring structures.**

No structures are proposed.

5. **Sewers, Sanitary, Storm drains**

No new utilities are proposed. See #8 for storm drainage.

6/7. **Landscaping**

No new landscaping is proposed.

The applicant has indicated that no existing vegetation will be disturbed on the site. The original railroad bed is void of any significant vegetation.

There will be a limited use of herbicides in the area of the track ballast to protect the integrity of the ballast and to reduce the potential for fire hazard. Any application would occur, at the most, once a year. The use of the herbicide will comply with all State, Federal and municipal guidelines.

8. **Soil and Drainage**

Craig Carrigan, PE, Development Review Coordinator, has reviewed the plan. See Attachment K. His original review comments are shown below.

1. The applicant has asserted that there will be no significant increase in stormwater runoff from construction of these improvements. I concur with this assessment.

   The applicant has asserted that the installation will not result in any upland ponding due to existing swales, culverts, catchbasins and the relative permeability of the gravel ballast. I do not believe that the permeability of the gravel will be maintained. Over time, fines will accumulate within the pore space and inhibit the passage of water. I cannot comment on the ability of existing culverts, swales, etc. to pass drainage since these features do not appear on the applicant's plans.

2. The potential for erosion and off-site sediment transport from construction of these improvements is directly related to any grading activities on site. No grading is proposed, however, modifications may be required depending on the outcome of the drainage issue.

Additional information was scheduled to be submitted on Friday by the applicant to clarify this submission. This information is shown as Attachment C. Staff will review this updated material prior to Tuesday's meeting.

9. **Exterior Lighting**

No new exterior lighting is shown on the plan.

10. **Fire**

The Fire Department has reviewed and approved fire-related concerns.

11. **Proposed development designed to be consistent with off-premises infrastructure, existing or planned by the City**

As mentioned previously, the city is in the process of developing a master plan for the Eastern Prom Trail. The issue of developing temporary trackage prior to the master plan being completed is discussed earlier in this report.

12. **Historic Landscape District**

The site is located within a historic landscape district. The proposal is not incongruous to the architectural style or character of the district. The Historic Preservation Committee recently approved a Certificate of Appropriateness for this project (see Attachment D). The historic use of this site included railroad trackage.

13. **No adverse impact on Natural Resources**

Documentation on natural resources present on this site is shown starting on Attachment B-93. A report by Woodlot Alternatives concludes that "the area proposed for use as a Narrow Gauge railway does not contain any significant wildlife habitat for any particular high value wildlife." Surface water quality should not be adversely effected.

SHORELAND REGULATION REVIEW

The proposed tracks are within the shoreland zone. A portion of the site is located within a flood hazard zone elevation. Information arrived on Friday regarding flood hazard documentation but due to the late hour could not be reviewed by staff.

1. Principal and Accessory Structures

No principal or accessory buildings are proposed.

2. Piers

No piers are proposed.

3. Vegetation

No vegetation clearance is proposed within 75 feet of the normal high waterline of Portland Harbor.

4. Erosion and Sedimentation Control

See Site Plan Review #8.

5. Soils

The existing soils served as the original railbed for the Canadian National Railroad. With the crushed stone ballast proposed by the applicant, soil issues are addressed.

6. Water Quality

The development activities of the proposal are set back a significant distance from the water. The proposed development and subsequent train related operations will not result in any direct detrimental impact to water quality.

7. Archeological Sites

Approximately 600 feet of the trackage will run below the historic Fort Allen Park. On June 15, 1994, the Historic Preservation Committee voted 6-0 (Thaxter absent) to recommend to the Planning Board approval of this application for a Certificate of Appropriateness (see Attachment ____).

8. Public Utility Services

There will be no new installation of public utility services.

9. Roads and Driveways

No roads of driveways are proposed within 75 feet of the normal high waterline.

10. Parking Areas

No parking areas are proposed.

11. Stormwater Runoff

See #8 in Site Plan Review section.

12. Agriculture

Not applicable.

13. General Site Plan Features

a. The proposal will maintain safe and healthful conditions;

See section on air emissions in this report and Attachment B-25.

b. The proposal will not result in water pollution, erosion, or sedimentation to surface waters;

See Site Plan Review #8.

c. The proposal will adequately provide for the disposal of all wastewater;

No wastewater will be generated by this proposal;

d. The proposal will not have an adverse impact on spawning grounds, fish, aquatic life, bird or other wildlife habitat;

Woodlot Alternatives surveyed the track site for high value wildlife and wetland habitats (see Attachment B-93). Their report finds that "the area proposed for use as a Narrow Gauge railway does not contain any significant wildlife habitat for any particular high value wildlife. Several very small, low value man-made wetlands occur in areas immediately adjacent to the old railroad bed. It appears as though the Narrow Gauge railway can be constructed without impacting these wetlands...The only wetlands that I observed on the site were man-made drainage ways that appear to have been created when the original railbed was constructed.

The small wet pockets, typically only a few feet wide, were all much less than an acre in size, and therefore are not subject to regulation by the DEP. These areas would be regulated by the ACE, even though they appear to be man-made and are of limited functional value."

e. The proposal will conserve shore cover and visual, as well as actual, points of access to inland and coastal waters;

The proposed trackage will be sited a significance distance from the water's edge on land that was previously disturbed by industrial and railroad uses. Visual access will not be disturbed because the tracks are elevated only about one foot high above the ground. Access to public waters will still be available. The proposed Eastern Prom trail will protect and enhance public access opportunities to the water.

f. The proposal will protect archeological and historic resources;

See Site Plan Review section, #7;

g. The proposal will not adversely affect existing commercial fishing or maritime activities;

The two existing maritime activities adjacent to the water, BIW and Portland Yacht Services, will not be adversely affected by this proposal. Both will have crossing rights over the tracks.

h. The proposal will avoid problems associated with flood plain development and use; and

i. The proposal is in conformance with the standards set forth in this section.

Staff has also reviewed this proposal for conformance with the "no adverse impact on marine uses standard" of the Waterfront Special Use Zone.

1. The proposed non water-dependent use will displace an existing water-dependent use.

   No existing water-dependent uses will be displaced by the proposed track.

2. The proposed use will reduce existing commercial vessel berthing space.

   No existing vessel berthing space will be reduced by this proposal.

3. The proposed non water-dependent use, structure or activities... will unseasonably interfere with the activities and operation of existing water-dependent uses or significantly impede access to vessel berthing or access to the water by water-dependent uses.

   The pertinent issue in this proposal relates to access over the rail corridor for water-dependent uses. There are two water-dependent uses effected by this proposal, BIW and Portland Yacht Services. Jeff Neil of BIW has reviewed the plan and finds the two rail crossings acceptable. The two rail crossings for Portland Yacht Services have previously been acceptable to the owner.

IV. MOTIONS FOR THE BOARD TO CONSIDER

On the basis of plans and materials submitted by the applicant and on the basis of information contained in #30-94 relevant to the standards for site plan review [and/or other findings as follows:]

1. That the plan is in conformance with the Site Plan Standards of the Land Use Code.

   A. Potential Conditions of Approval

      i. In light of the temporary nature of this proposal, use of the temporary railroad tracks shall be terminated by (date). A revised site plan shall be submitted by the applicant for review and approval by the Planning Board reflecting the recommendations of the Eastern Prom trail master plan.

         (See also pages 3 and 4.)

      ii. That additional information be submitted on the developer's financial capacity for staff review and approval.

      iii. That additional submissions relating to stormwater management be subject to staff review and approval.

      iv. That an executed agreement with MDOT be submitted covering operations of the Maine Narrow Gauge Railroad Company and lease of corridor for rail use.

v. That noise measurements relating to the train including whistles, shall be reviewed by staff for conformance with the noise standards of the zoning ordinance.

vi. That the temporary trackage shall have railroad tie lengths no longer than:

a. Narrow Gauge Standard (five feet)

or

b. Full Size Standard (eight feet)

vii. That the applicant shall be responsible for the cost of all rail crossings; safety barriers and other safety measures, buffers, other amenities and improvements adjacent to the trail, related to appropriate mitigation of the train use.

viii. That the interior walkway system shall be revised for staff review and approval.

ATTACHMENTS:

A. Site plans
B. Background information
C. Updated submission
D. Letter from Historic Preservation Committee
E. Memo from Associate Corporation Counsel - Summary of MDOT Lease and Operating Agreement
F. Memo from Associate Corporation Counsel - Review Authority for Maine Narrow Gauge Railroad
G. Letter from Nathan Smith, Eastern Prom Advisory Committee
H. Letter from Thomas Valleau to MDOT - crossing rights
I. Consultant Eastern Prom Trail Master Plan Concepts
J. Memo from Development Review Coordinator on Air Emissions
K. Memo from Development Review Coordinator
L. Letter from Zoning Administrator regarding zoning
M. Maine Narrow Gauge Railroad Company and Museum - inter-relation between track and trail
N. Maine Narrow Gauge Museum approval letter

LEGEND

- PROPERTY LINE
- ADJOINING LINES
- FENCE LINE
- BUILDING
- UTILITY POLE
- SEWER LINE
- RETA WALL
- ZONE LINE — CITY OF PORTLAND ZONE LINE, BASED ON THE MOST RECENT ZONING
- R.O.S. ZONE — RECREATION AND OPEN SPACE ZONE
- 3715/64 — DEED REFERENCE, CUMBERLAND COUNTY REGISTRY OF DEEDS
- ○ — 5/8" REINFORCING ROD CAPPED "SM"
- ● I.E. — IRON RODS FOUND
- CENTER-LINE OF TRACKS

FORE STREET

INDIA STREET

COMMERCIAL STREET

CANADIAN NATIONAL RAILWAY COMPANY TO PORTLAND HARBOR DISTRICT 3870/101

CURVE DATA: Δ = 4° 09' 56.45" R = 1381.40 TAN = 35.91 CHORD = N 14° 55' 00" E 67.40

CURVE DATA: Δ = 15° 20' 56" R = 1317.46 TAN = 38.00 CHORD = N 21° 00' 00" E 75.52

ONE INDIA STREET LOT 34,345 SQ. FT. LOT 1

GRAND TRUNK 3 STORY BRICK OFFICE BUILDING

PERPETUAL RIGHT AND EASEMENT TO BENEFIT THE OWNER OF CITY OF PORTLAND LOT 1 IN COMMON WITH OTHERS IN THE OWNER OF THIS ONE INDIA STREET PROPERTY

PERPETUAL RIGHT AND EASEMENT TO BENEFIT THE OWNER OF THIS ONE INDIA STREET PROPERTY IN COMMON WITH THE OWNER OF CITY OF PORTLAND LOT 1

TO BE CONVEYED TO THE CITY OF PORTLAND (ABUTTER)

PARCEL A 50.00 × 100.00 = 5000 SQ. FT.

PARCEL B 50.00 × 100.00 = 5000 SQ. FT.

16" DIAMETER R.I. PIPE STORM DRAINAGE L=12' to 15'

APPROXIMATE LOCATION SEWER EASEMENT TO M DOT 1140/148

WATERFRONT PORT DEVELOPMENT ZONE. TO BE CONVEYED TO THE CITY OF PORTLAND DOT, 2

EXISTING PEDESTRIAN CROSSING ◦ PROPOSED PEDESTRIAN CROSSING

EXACT LOCATIONS & WIDTHS OF CROSSINGS SUBJECT TO FINAL NEGOTIATION BETWEEN CITY OF PORTLAND & MDOT.

CITY OF PORTLAND SHORE LAND ZONE LINE 250' FROM NORMAL HIGH WATER

℄ of TRACK

9' TYP. SETBACK

N 36° 16' 28" E

26' CORRIDOR TO BE CONVEYED TO MAINE CENTRAL RAILROAD

0.58 ACRES

MEMORANDUM OF PIER LEASE CITY OF PORTLAND TO EARTH IRON WORKING CORPORATION 4816/86

PORTLAND WATER DISTRICT

APPROXIMATE LOCATION

33" FORCE MAIN SEWER LINE

EXISTING VEHICULAR CROSSING ◦ PROPOSED VEHICULAR CROSSING

CROSSINGS TO BE CONSTRUCTED BY H.G.P.A. CO.

LICENSE FOR INGRESS AND EGRESS 6677/336

FUTURE PEDESTRIAN CROSSING (To be petitioned by City of Portland to MDOT)

TO BE CONVEYED TO THE CITY OF PORTLAND (ABUTTER) PARCEL B

METAL BUILDING YALE CORDAGE

1 STORY CONC. BLOCK BUILDING EXPRESS COPY

GORDON L. HURTUBISE D/B/A G.L.H. ENTERPRISES TO LOREMAN G. WEST, ET AL. 3434/247

AMERICAN HOIST & DERRICK CO. TO PARLEY INVESTMENT COMPANY 6574/80

CONNECTOR BETWEEN BUILDINGS

PEDAL GASOLINE TO CANADIAN NATIONAL RAILWAY 3714/71

TOTAL OF CITY OF PORTLAND LOT:

LOT 2	134,441 Sq. Ft.	4.66 Acres
PARCEL A	5,196 Sq. Ft.	0.07 Acres
PARCEL B	30,781 Sq. Ft.	0.71 Acres
TOTAL	228,418 Sq. Ft.	5.84 Acres

126 ±

300 YARD PLAN LINE, BOOKS 65 & 145 AS SCALED FROM PLANS INDEPENDENT SURVEY MAP MAINE CENTRAL RAILROAD, DATED JULY 11, 1986

PLAN REFERENCES:

1. RIGHT OF WAY AND TRACK MAPS, CANADIAN NATIONAL RAILWAY CO. V26/53 V26/54
2. CANADIAN NATIONAL RAILWAYS PLAN SHOWING RAILWAY PROPERTY IN THE CITY OF PORTLAND AND DIGGINS YARD, SEPTEMBER 5, 1957, PLAN 5084
3. PORTLAND HARBOR DISTRICT, PRELIMINARY PLANT LAYOUT AND INDIA STREET FORCE MAIN EASEMENT PLAN, SHEETS 1 & 2 OF 2, FEBRUARY 15, 1974.
4. PORTLAND WATER DISTRICT, PRELIMINARY PLANT SITE, H.I. & E.C. BORDMAN, FEBRUARY 15, 1974, FILE 10-2.
5. PORTLAND WATER DISTRICT INDIA STREET FORCE MAIN SHEETS 3,4 & 5 OF 5, FEBRUARY 15, 1974, H.I. & E.C. BORDMAN, FILE 0 "5".
6. PLAN OF EARTH IRON WORKS, H.I. & E.C. BORDMAN OCTOBER 15, 1963 FILE 0 "5"
7. PLAN OF TRADELAND HOUSE CONDOMINIUM, H.I. & E.C. BORDMAN, MAY 31, 1984, FILE 0 87.
8. PLAN OF FRANK T. GARLAND, H.I. & E.C. BORDMAN OCTOBER 15, 1984, FILE 0 12
9. PLAN OF WILLIAM R. BRADLEY, H.I. & E.C. BORDMAN MARCH 26, 1906, FILE 0 87
10. CITY OF PORTLAND ASSESSORS PLANS 1, 2, 4, 5, 6, 18, 19, 20, 444, 445 & 446.

AREA: EXCLUSIVE OF SHORE LOTS 51.01 ACRES
SHORE LOT C1 0.86 ACRES
SHORE LOT C2 4 ACRES
SHORE LOT C3 4 ACRES
TOTAL ACREAGE 30.11

AREA ADJUSTED 4/25/95 TO TAKE OUT ONE INDIA STREET LOT

NOTE: LENGTH OF TRACK THIS SHEET = 1185'

EXISTING CONDITIONS IS FROM PLANS TITLED 'LAND TITLE SURVEY & TOPOGRAPHIC PLAN BY OWEN HASKELL, INC. DATED FEB. 10th 1995' AND FROM PLANS TITLED 'POLLUTION ABATEMENT FACILITIES BY CAMP, DRESSER & MCKEE INC. DATED APRIL 1976'.

NOTE: LOT 18 ON RAILROAD PLAN V26/54 DEED OF JAMES HUNTFOOT BOOK 561, PAGE 404, GRANTS OWNER OF DRAIN RIGHTS ACROSS THIS LAND. THE STATUS OF THESE RIGHTS TODAY IS UNKNOWN.

6-24-96 mvl - ONEONTA, DRAWING

MAINE NARROW GAUGE RAILROAD CO. & MUSEUM

Boothbay

PHASE I —

Temporary Track Placement & Train Passenger Service

Prepared by Myler & Spratlin, Landscape Architects Inc.

DATE: 6-24-96

SCALE: 1" = 40'-0"

Drawing # 2

FORE STREET

VAUGHAN ST.

ST. LAWRENCE ST.

ATLANTIC ST.

MUNJOY ST.

Vehicular Circulation

Pedestrian Circulation

Restroom Facilities

ONE-WAY AROUND MUSEUM

MAINE NARROW GAUGE R.R. MUSEUM

Coal Storage Bin

FISH POINT ASSOCIATES TO PHINEAS SPRAGUE 4870/248

Existing Dumpster Location

Rider Embarking/Debarking Zone

Shallow Collection Swale

Railcar Storage and Transfer Yard (previously approved)

SPECIAL USE ZONE RECREATION AND OPEN SPACE ZONE

WATERFRONT PORT DEVELOPMENT ZONE

SPECIAL USE ZONE

CASCO BAY / FORE RIVER

EXISTING CONDITIONS IN THIS PLANS TITLED "LAND TITLE SURVEY & SUBDIVISION PLAN BY" PHILIP HASKELL, INC. DATED FEB. 1974 AND 1 PLAN TITLED "POLLUTION ABATEMENT FACILITIES BY CAMP, DRESSER & MCKEE INC. DATED APRIL 1975"

UNITED INDUSTRIAL SYNDICATE, INC. TO STATE OF MAINE 3488/168 DEC. 15, 1874

ATLANTIC AND ST. LAWRENCE RAILROAD CO. TO THE PORTLAND CO. 224/ 277 274/ 283

DEEDS & LEASES 3480/ 318 4876/ 248 3478/ 186 4811/ 30 4868/ 118 4868/ 234

NOTE: LENGTH OF TRACK THIS SHEET = 1978'

GRAPHIC SCALE 0 20 40 80 160 FEET

MAINE NARROW GAUGE RAILROAD CO. & MUSEUM

PHASE I — Temporary Track Placement & Train Passenger Service

Prepared by Myler & Sprotte, Landscape Architects Inc.

DATE: 6-14-94

SCALE: 1" = 40'-0"

Drawing # 3

CITY OF PORTLAND, PORT ALLEN PARK - Historic District
RECREATION AND OPEN SPACE ZONE

THE PORTLAND HOUSE

TRUSTEES OF WALTER H. JEFFORDS TO PORTLAND HOUSE INC 6480/182

HISTORIC DISTRICT

PORT ALLEN PARK

CITY OF PORTLAND SHORE LAND ZONE LINE, 250' FROM NORMAL HIGH WATER

GAZEBO

ROAD

FISH POINT

PARCEL C

R05 ZONE

SHEET 1 OF 6 MATCH LINE

SHEET 4 OF 6 MATCH LINE

EXISTING CONDITIONS IN THIS PLANS TITLED "LAND TITLE SURVEY & SUBDIVISION PLAN BY OWEN HASKELL, INC. DATED FEB 13TH 1989" AND FROM PLANS TITLED "EVALUATION ABATEMENT FACILITIES BY CAMP, DRESSER & MCKEE INC. DATED APRIL 1978".

NOTE: LENGHT OF TRACK THIS SHEET = 845'

GRAPHIC SCALE
0 20 40 60 100 FEET

100 YEAR FLOOD LINE, ZONES A8 | V2 46 SCALED FROM FLOOD INSURANCE RATE MAP PANEL 230061 0014B, DATED JULY 17, 1984

6-14-94 REV. - DIMENSIONS

MAINE NARROW GAUGE RAILROAD Co. & MUSEUM

● PHASE I —

Temporary Track Placement & Train Passenger Service

Prepared by Meier & Eppolito, Landscape Architects Inc

DATE: 6-14-94
SCALE: 1" = 40'-0"

Drawing # 4

B-1

MOHR & SEREDIN
Landscape Architects, Inc.

June 14, 1994

Mr. Richard Knowland, Senior Planner
City of Portland Planning Department
City Hall
389 Congress Street
Portland, ME 04101

Re: Maine Narrow Gauge Railroad Amended Site Plan Submission

Dear Rick,

Attached please find our submission, made on behalf of MNGRR, for staff and Board review at the June 28 public hearing. We have prepared the enclosed plans and written documentation in support of the application to install 3,400 feet of track in the MDOT rail corridor along the lower Eastern Promenade area.

As previously discussed with staff and the Board, the proposal is for a "temporary" installation of the tracks pending final design recommendations from the Eastern Promenade Trail Advisory Committee. The term temporary is used only in connection to the physical location of the track, and not to a time frame for duration of use of the rail corridor. As previously stated, the track will be installed and should the EPTAC recommendations advise a different location or alignment, MNGRR will move/realign the track at its own expense.

As you are aware, we will be meeting with the Historic Preservation Committee and the Trail Advisory Committee on the 15th to review the plans and secure a certificate of appropriateness. Please review this information and call if you have any questions.

This submission includes the following:

18 Pleasant Street, Portland, Maine 04101
(207) 871-0003

Drawings:	#1	Cover sheet
	#2	Track Alignment & Site Plan Details
	#3	Track Alignment & Site Plan Details
	#4	Track Alignment & Site Plan Details

Sincerely,

Stephen B. Mohr, ASLA

SBM/sd

Attachments

252\knowlnd2

DRAINAGE NARRATIVE

BACKGROUND

MNGRR is proposing to construct approximately 3,000 feet of new rail line in the existing 26 foot wide MDOT rail corridor along the eastern shore of the Portland peninsula. The proposed rails will be constructed on a base of 6" to 8" of crushed rock, and will be placed on the existing, compacted gravel base which occurs within the rail corridor. The total area to be utilized by the tracks will be 34,000 SF, inclusive of the ballast base, switches and connecting track to the museum.

EXISTING CONDITIONS

The rail corridor is currently imported, compacted gravel surface from Commercial Street to the Portland Yacht Services yard, and compacted railroad track base from PYS to the area off Fort Allen Park. From the southerly property line of PYS to the Portland House, there is some grass growing in the gravel base, and approximately 1,800 SF is lightly vegetated by these grasses and weeds.

The drainage from the rail corridor flows directly to the Fore River/Casco Bay. The existing gravel parking areas sheet drain to the Bay, as well as to being collected by two existing catchbasins within the graveled areas near BIW. In the corridor at Portland Yacht Services, the slight cross pitch of the terrain sheet drains the area toward Casco Bay. From PYS north, the drainage pattern flows westward to a swale at the base of the ledges at Fort Allen Park. The swales are drained by existing culverts which lead directly to Casco Bay.

POST-CONSTRUCTION CONDITIONS

The addition of the new ballast and track will not increase the runoff from the existing rail corridor. The compacted gravel soils are similar to the stone ballast, ties and tracks in runoff coefficient, and there will be no change in impervious area due to the existing conditions found in the rail corridor.

The location of the tracks will not impede the existing drainage patterns due to the location of the existing swales, drainage patterns, catchbasins and permeability of the ballast base used for the rail line. The construction of the line will not result in uphill ponding, flooding or drainage problems, and there will be no downstream impacts resulting from the track installation.

RAILROAD CONSTRUCTION PLAN

MNGRR is proposing to install the ballast base, ties and track utilizing volunteer labor and limited mechanized equipment. The sequence of operations will be to access the track area from Commercial Street, and through the Portland Engineering property. The track location will be verified by the MNGRR Operations Manager, Emmons Lancaster, P.E., and all construction activities will be monitored by Mr. Lancaster. The construction will consist of loads of ballast being sequentially dumped down the length of the corridor, and the ballast being spread by mechanical as well as hand labor. Once the ballast is in place, the ties will be set in the ballast, leveled and backfilled by hand. The final operation will be the placement of the rails, which will be installed in 30 foot sections.

MNGRR anticipates that the track will take approximately three to five weeks to install, and is proposing a schedule as follows:

1. Grade base area	June 30 - July 8
2. Install ballast base	July 10 - July 18
3. Install ties and rails	July 10 - July 30
4. Install over ballast between ties	July 18 - July 30

The volunteer labor are all friends of the MNGRR, interested public or trustees/members of MNGRR. They are all familiar with track installation techniques, and will be working under the direct supervision of Emmons Lancaster, P.E.

Agreements have been reached and the MDOT permit to perform the construction work is included with this submission.

RAILROAD OPERATIONS PLAN

MNGRR Co. is proposing to develop the railroad as a rail operation providing passenger service in the historic cars, a demonstration railroad and a historic restoration project. As a part of the museum, the train rides will educate the public about railroading in general, the history of railroads in Maine and the importance of narrow-gauge railroads as a part of the development of the State of Maine.

MNGRR will be operating 4 to 5 trains daily on the 3,400 feet of track, between the hours of 10:30 a.m. and 7:30 p.m. and will leave from the museum site. Tickets would be purchased at the museum, with boarding occurring at the railside area at the tracks near the museum. MNGRR will operate the train under certification from the State of Maine Department of Transportation as an excursion/passenger train service, and all operations will conform with the regulations of that agency.

The diesel locomotive will be utilized for the majority of the 30 to 35 weekly trips. The steam locomotive will be used 2 to 3 days a week for 2 to 4 of the runs. Under no circumstances will the steam engine be used for more than 40% of the trips, regardless of the total number of weekly excursions. The train will have between 2 and 8 cars attached to the locomotive, and will be capable of carrying up to 200 passengers. There are two cars accessible to the disabled, and all operations will be in conformance with MHRA and ADA standards.

The majority of the train operations will be conducted with the diesel engine, not the steam locomotive, so any fire hazard will be very limited by potential time of operation. The locomotive stack is constructed with a fire/spark arrestor to eliminate sparks exiting the fire box, and the engine will be operated by personnel trained for proper firebox operations. The railroad ballast will remove immediate fire danger from the track area, and regular maintenance will maintain the tracks to eliminate combustible materials in and around the tracks.

There will be limited use of herbicides in the area of the track ballast to protect the integrity of the ballast and to reduce the potential for fire hazard. Any application would occur, at the most, once a year. The use of the herbicide will comply with all State, Federal and municipal guidelines, will be applied by a licensed applicator, and will be selected to assure that it does not affect adjacent vegetation, shoreland habitat or groundwater.

TRACK CONSTRUCTION

MNGRR Co. proposes to construct approximately 3,400 linear feet of trackage from India Street to Fish Point. Although the "Narrow Gauge" Rails are only 2' wide, they are proposing to construct their railroad bed using 8-foot "standard gauge" railroad ties, for the following reasons:

1. The 8-foot ties have been recommended by MDOT because they would meet any future plans to convert the corridor to standard gauge trains. Additional ties may need to be added between each of the proposed ties, but that addition would be a minor addition.

2. If the corridor is converted in the future to standard gauge, the effect of the wider ties will be to avoid disturbance to the Eastern Prom trail. The proposed installation would avoid the expense and time involved with tearing up the 5' ties and replacing them with the longer 8' ties.

3. MNGRR Co. believes that by placing the 2' rails to the inland side of the 8-foot ties the remaining length of the ties and ballast would act as a physical barrier between the train and the trail's biking and pedestrian users. Due to MDOT requirements that no stationary objects can be placed within this 26' corridor, such as fences or posts, this proposal holds merit for increasing public safety near the tracks.

See Typical Track Cross Section, for graphic representation of ties and ballast.

TRACK PLACEMENT

The first phase of track placement has been defined as "temporary" track placement due to MNGRR's commitment to fully comply with E.P.T.A.C. master plan. Temporary has been used to define the location, not the length of time in services or duration of activities. MNGRR has agreed to shift the track alignment either vertically or horizontally to make the overall corridor as appropriate to bicyclists and pedestrians, as it will be to the train riders. The location of the tracks is as reviewed by Portland Trails, and leaves sufficient room within the right of way for other uses as proposed. MNGRR's proposal to lay over 3,400 linear feet of track is based on the desire to avoid the possible conflict areas along the corridor, otherwise referred to as "pinch points," and let the master plan dictate the future track alignment. Phase II of the track placement would involve additional track placement from Fish Point to the abandoned trestle bridge near the Back Cove.

The rail will be located as close to the inland edge of the MDOT corridor as is technically and legally possible, so as to provide the greatest area possible between the rail line and the water. The only exception to this track location will be the 300 feet of track ending closest to India Street. This alignment provides the most usable space for pedestrian circulation between the rail line and the 3 story Grand Trunk Building at 1 India Street. See attached Portland Trails memo for comments regarding rail location.

PARKING/PEDESTRIAN CIRCULATION

Parking and pedestrian circulation at the Portland Engineering site has been delineated and painted out at the site. The MNGRR Museum has been previously approved and includes 20 parking spaces. Parking for train ridership is estimated at approximately 15-30 parked cars at one time during a weekday, and 30-60 parked cars during weekends. Special events, such as rail fair, may attract up to 60-90 parked cars, at one time. The Portland Engineering Company complex has the capacity to hold these projected numbers based on the existing parking layout. See Parking Distribution Diagram for the Portland Engineering site.

The Rider Embarkment/Debarkment Zone has been designated on the site plan, Drawing #3. Pedestrian circulation has been painted from the Museum to the car storage yard and has been successfully used this spring. An additional crosswalk leading to the Embarkment/Debarkment Zone will be painted following plan approval.

Public Restroom Facilities are provided within the MNGRR Museum which will be used by visitors/riders of the MNGRR & Museum. Signage will be provided to denote restroom location and to direct museum visitors to the trains.

AIR EMISSIONS

The air emissions from the trains fall into an unregulated category; moving source emissions under the state/federal thresholds for pounds/types of emissions generated on an annual basis. Even if the trains were to be considered stationary, they are well under the current thresholds for licensing by the DEP Air Quality Bureau.

At the request of the Portland Planning Board, and in response to public and neighborhood concerns, MNGRR has had an Air Quality Modeling and Comparison report prepared by Susan Romatzick, of Paladin Environmental, who is also Instructor of the Environmental Technology Program at S.M.T.C. Susan's credentials are included under the Technical Capacity section of this Submittal, and her findings regarding air quality and air pollution from the locomotives follow this introduction.

Other input received via MNGRR Company and Museum regarding the process of coal combustion has been prepared by William L. Petitjean, a nationally renowned expert on combustion processes. The previously submitted Combustion Emission Comparisons have also been resubmitted as back up data on combustion and air consumption.

We have also attached information prepared by Dr. Gilbert Wilcox regarding the potential of health hazards, some of which has not been previously submitted.

WILDLIFE & WETLANDS

The area to be occupied by the railroad does not contain habitat of high value for wildlife or sea birds.

A complete survey of the site regarding unusual natural areas, wildlife and fisheries habitat, or archaeological sites located on or near the MDOT corridor has been performed by John Lortie, of Woodlot Alternatives, Inc., and is included in this submission.

FINANCIAL & TECHNICAL CAPACITY

The majority of the materials needed for the 3,400 linear feet of track construction, i.e. ballast, ties and rail, have been donated, or will be donated, pending final approval. MNGRR has all the ties and rail in their possession now. The labor involved to grade the corridor and lay the trackage will also be donated volunteer labor.

The value of the construction work is estimated at $18,000 to $24,000 inclusive of labor and materials. The value of the rails for scrap metal is approximately $28,000 to $30,000.

The Board of Trustees of the MNGRR Co. & Museum has appointed J. Emmons Lancaster as the first superintendent of the MNGRR. Mr. Lancaster will be overseeing and managing the construction and the safe, efficient operations of the trains. Other volunteers who will be involved with the construction and operation of the rail line also have numerous years of experience in track laying and train operating.

ZONING STANDARDS

The proposed track is located in three zoning districts, as well as the overlay shoreland zoning district. The districts are as follows:

Waterfront Port Development	(India St. to Portland Engineering)
Waterfront Special Use Zone	(Portland Engineering)
Recreation and Open Space	(Portland Engineering to Fort Albert)

Per the municipal ordinance and code enforcement office, train tracks are permitted uses within these zones, and are consistent with the types of uses proposed/found in these areas of the City.

With regard to Section 14-320.55 of the Portland Land Use Code, we submit the following:

The re-use of the existing MDOT owned railroad bed will not have an adverse impact on existing or future marine opportunities based on the following:

1. The proposed activities do not displace an existing water-dependent use;

2. The proposed uses do not reduce existing commercial vessel berthing space;

3. The proposed facilities, activities and related parking and improvements will not interfere with the operations and activities of water dependent uses, nor will they impede access to Casco Bay or vessel berthing. Existing access has not been blocked by the proposed project;

4. The siting of the new track and related facilities does not reduce or inhibit existing public access to marine or tidal waters. The proposed plans will increase public access to the pedestrian path adjacent to Casco Bay, and provide for additional opportunities to enjoy the Bay from the train.

ORDINANCE NARRATIVE

Section 14-525-C Portland Land use Code

1. On behalf of the Maine Narrow Gauge Railroad Co. (MNGRR) we submit the attached plans for amended site plan review, as set forth in the original site plan approval by the Board. MNGRR is proposing to install 2 foot wide tracks for the Narrow Gauge Railroad from India Street to Fish Point. This is intended to be the first phase of a track line which will eventually run from India Street to the Back Cove bridge.

   MNGRR is proposing to locate the lines within the dedicated right of way approved by the State and City, and to place the tracks consistent with the needs of the railroad and the future pedestrian use of the right of way. The location of the tracks is as reviewed by Portland Trails, and leaves sufficient room within the right of way for other uses proposed by the City, MDOT and Portland Trails. No changes are proposed beyond the 10 to 12 foot wide corridor of the tracks.

   The new tracks will be utilized for operating the existing engines and rolling stock outside of the immediate yard of the museum, and to provide limited passenger service for special events at the museum. The attached narratives specify the details of the train.

2. Total land area to be utilized by the train is 0.93 acres, all located within the MDOT corridor. MNGRR has an agreement with MDOT for the use of this area to operate the Narrow Gauge Railroad.

   The 26' wide MDOT corridor is located in the waterfront Port Development Zone that extends from India Street to the Portland Engineering Co. complex. The corridor occupies .95 acres in this zone, .62 acres in the WSUZ zone and .45 acres in the ROS zone..

   No building or accessory structures are proposed as part of this project.

3. Existing or proposed easements within the corridor consist in the form of crossings, either pedestrian or vehicular. Portland Yacht Services has formal agreements with MDOT for 2 vehicular crossings and 1 pedestrian crossing. Two other crossings are being worked out with the City and MDOT. MNGRR Co. has proposed approximate locations and has agreed to pay for the construction of crossings at the BIW facilities.

4. Solid waste generated by the MNGRR will be limited to fire box ash which will be disposed of in sealed containers.

5. The Portland Engineering Company complex is currently served by utilities such as sewer, water and electricity from mains located along Fore Street. The train will not require additional sewer, water or electric services.

6. See Drainage Narrative.

7. See Construction Plan.

8. No state or federal regulatory approvals are pending, or required.

9. See Financial & Technical Capacity narrative.

10. A draft copy of the lease agreement between the Trust for the Preservation of Maine Industrial History and Technology and the MDOT has been submitted to Gary Wood, City of Portland, for his review. Phineas Sprague will be meeting with him within a week to finalize the terms and agreements. A final copy of the lease will be submitted after final approval.

11. See Wildlife & Wetland narrative.

NOISE

Sound types and levels found in the area of the Museum are typical to those found in both residential and industrial waterfront areas e.g.: boat whistles, fog horns, machinery, diesel engine automobile traffic, childrens' voices. Much of this noise falls within the range of 50 dB (Residential) to 90 dB (Industrial). The back-up signal on the crane at BIW is at the upper end of this range, while the residential neighborhood falls in the low end of the sound spectrum.

Noise generating activities from the proposed train use will be limited to the sound occurring as a result of the operation of the train engine and the use of the train whistle. The train's hours of operation will be limited to between 10:30 a.m. and 7:30 p.m., and the train will be utilized for a maximum of five (5) trips during that period. For each trip the train will be using the whistle for short (1 to 3 seconds) blasts when departing and arriving, as required for safety.

Based on Federal DOT information (Handbook of Urban Rail Noise and Vibration Control, Savienman and Wilson), small train engines such as the diesel and steam engines owned by MNGRR generate sound levels of 35 to 45 dB at rest, and 55 to 75 dB when operating (both measured 50 feet from the source). Whistles operate in the sound range of 60 to 90 dB, dependent upon whistle type ad purpose.

MNGRR will comply with the noise standards of the Waterfront Special Use Zone for all the areas in which the train operates. The operational sound levels, as measured within 50 feet of the train, will not exceed the 75 dB level set forth in the ordinance. The use of the whistle will be limited to only these times when the train arrives or departs (a maximum of 12 times daily), and will be for a short (under 3 seconds) duration. Longer, louder whistle use will only occur for safety or emergency purposes.

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RESPONSES TO QUESTIONS ADVANCED TO THE PLANNING BOARD BY THE EASTERN PROM TRAIL ADVISORY COMMITTEE ON MAY 10, 1994:

(Resubmitted)

1. *Some concern that the "temporary" placement of the rail line may undermine the planning process for the entire rail corridor underway with the Eastern Promenade Trail Advisory Committee.*

From the beginning of the plans for the Eastern Prom Trail planning process, the State, City and Portland Trails have been aware that the Maine Narrow Gauge RR, would be located in the corridor, and for financial reasons, had to be slightly ahead of the trail planning process for a portion of the right of way. The planning process began with locating the rail in a way that recognizes MDOT's requirements for the 26 foot rail corridor, the engineering constraints on railroad track design, and the need to maximize the room available for the trail. MNGRR has done this planning in the areas where MNGRR is contemplating temporary track.

The alternatives for the placement of the track are limited due to the engineering requirements of the train, and MNGRR has exercised choices to always make the most room for the trail. There is little artistic creativity or flexibility with the rail design as the components are functional: rails, ties, and ballast. MNGRR intends to keep the rail to the land side of the right of way to maximize the room for the trail. In the section between the Portland Company and Commercial Street, the right of way is 26 feet wide and that is where the track will have to go unless someone wishes to change the location of the right of way.

MNGRR has agreed to move the rail at the railroad's cost alone, if the planning process ultimately decides that the rail should be elsewhere on the right of way than where the tracks are proposed to be located on the current MNGRR plans. The constraints on the location are primarily engineering issues, but they also include the requirement to meet track standards imposed by the landlord and the physics of railroad design.

2. *What is the economic necessity of the temporary installation? Would paying Passengers be carried on the rail line during the "temporary" phase of the rail line?*

The Museum depends upon revenues from the running of the railroad to operate. MNGRR is paying the City of Portland property tax on the equipment, and has a

debt service of over $785,000. Interest rates are climbing and presently the only source of income is donations. One important revenue source is the public, who will pay to ride on the MNGRR. The viability of the museum depends on having an operation which engages the volunteers this summer, brings public attention to the operating railroad, and generates interest in the MNGRR facilities. Through this interest there will be economic viability, which is necessary to operate this facility.

There will be a period during the construction that passengers will not be allowed to ride on the train. The track must be inspected and approved by the State before the operation is certified for passengers. During the construction period, passengers will be carried on sections that have certification by the State, and after final certification, paying passengers will be carried on the lines.

3. *Are their rigid deadlines which have been imposed by the lenders who are providing financing for the project based on the need to generate certain cash flow levels within specified periods of time?*

The community financing support was developed because of the interest in an operating Museum and railroad. The issue was not how much revenue, but how quickly, and to where the train would operate. MNGRR has a performance condition on the loan from the City and the banks. The loan is in default if the Narrow Gauge is not operating over the corridor by next spring (1995). It will take until next spring to accomplish that goal even if MNGRR starts, in June of this year, to lay track and begin excursion operations.

4. *Is it necessary to have two tracks?*

The second track is called a passing track and is a necessary part of the operations. At the end of the line, the locomotive disconnects from the train and switches over to the passing track, passes the cars, switches back onto the main line and reconnects to what has now become the front end of the train. Without the passing track the train must back up when it changes directions. Pushing the cars from the rear is acceptable for the short term, but like backing up a truck, it is awkward and not advisable for long lengths. MNGRR will defer on the installation of the Commercial Street passing track until the matching passing track is built on the other end of the line. For obvious operating reasons, the passing track has to be longer than the train.

5. *If a temporary installation is permitted, could the track begin adjacent to Parcel B approximately 1,000 feet from the intersection of Commercial Street and India*

Street and then run along in front of the Sprague Property to it's northern boundary, about 1,000 feet, thus avoiding the necessity of any temporary pedestrian crossings and minimizing the need for relocation after site plans for the entire corridor have been completed?

MNGRR feels strongly that the railroad experience needs to be long enough to justify a charge, and to attract people to come into the town or to the Museum. MNGRR also feels that it is necessary and essential to connect the Museum with the Old Port area this summer and to provide a visual, as well as physical, connection to the City.

The length of the track is set at the Portland Engineering Company by the train operations. In order for the train to get out onto the right of way, it has to pass entirely through the switch. This means that at a minimum, there needs to be a train length of track past the switch that is on the Eastern end of the Portland Company property. In consideration of the future design of the choke point by the East End beach, the MNGRR proposal only goes as far as the Cruiser Portland Monument. Revenues from the ride will be used to pay operating expenses.

6. *If there is to be a temporary track with a crossing, will the crossing be at grade? Will there be gates? Lights? What will the surface be? Who will pay for it?*

The track will lay on railroad ties which are located on the crushed rock ballast. The simplest crossing has gravel between the rails and a gravel ramp on both sides to bring the crossing to grade. The current layout does not anticipate any need for gates or lights. There will be signage, and the speeds will be very low at the crossings. It is MNGRR's understanding that the entity wishing to cross the rail pays to put in and maintain the crossing. To the extent that this is not an elaborate installation, MNGRR would maintain the crossing at its expense, but the crossing right and conditions are given by the MDOT. The crossings for BIW will be at grade crossings, installed by MNGRR as set forth above.

7. *What barriers or fencing will, or should, be placed between the rail and trail areas in order to keep young children, dogs, etc., away from the railroad tracks?*

The experience with this equipment at Edaville for the last 46 years (and 10 million visitors, one-third of which were children), is that barriers have not been necessary to keep children, dogs, cats, or baby carriages out of the path. Barriers could become a hazard, if they trap people or animals inside the right of way or obscure the operator's view of the activities on either side of the rail. Other cities have had

similar experiences, as outlined in the attached articles. Once the temporary operation is in place, observations and experimentation can take place within the State regulated guidelines for clearances from fixed objects. MNGRR feels that barriers are not only unnecessary, but unsightly, and needlessly reduce the feeling of openness on the site. The final design guidelines from the Advisory Committee will set the standards for barriers and separation.

8. *What will the speed ranges be, given the limited travel distance and public safety concerns? Will this be an agreed upon speed?*

MNGRR has chosen a 15 mile-an-hour design speed for the track. The State Rail Division or the Federal Rail Authority regulate the speeds.

9. *What fuels will be used on the railroad, and what will the railroad's hours of operation be?*

The railroad will be using Diesel fuel and Gasoline predominantly. MNGRR plans that Steam locomotives will only be used on weekends or on special occasions. The Steam locomotives burn bituminous coal. They will be using a special grade of coal to reduce potential emission impacts. Daylight and early evening hours are the proposed operating times.

10. *Is there an unequivocal understanding that if a temporary track is installed and it needs to be relocated (whether the distance is one foot or thirty feet) because of the final design of the corridor, the relocation will be done promptly and at the expense of the Maine Narrow Gauge Railroad?*

In the area between Commercial Street and Fish Point, we have offered to move the track anywhere on the rail area of the right of way at our expense, promptly, if the temporary location is found to be inappropriate. Refer to 1 above for additional response on this issue.

11. *If a temporary rail line is permitted, would it be possible for it to be a short stretch of track that would demonstrate to the City as a whole the type and level of improvement that could be expected of the railroad for a longer stretch of track?*

MNGRR is in the process of installing a 30 foot long section for Planning Board review and public inspection. MNGRR has proposed to install a length of track that was short and would serve to connect the Museum with Commercial Street as a demonstration line, if it is felt to be appropriate.

12. When the trail is installed in the future, who will bear the burden of safety at crossings or in areas of close Rail/trail proximity?

The Maine Department of Transportation has jurisdiction over any crossing of the rail corridor, and will decide the manner of crossing and the level of warning devices required before the construction of the crossing. The EPATC will also be providing input on this issue.

The means of separation in constricted areas is a matter of careful design and the final approval in the hands of the State Rail Division.

It is the responsibility of the MNGRR and its trains to operate in a safe manner at all points, but it is also an equal responsibility upon the trail users to respect the rail corridor. Cross use of the rail corridor has not proved to be a problem at Edaville.

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SHORELAND ZONING

Work within the Shoreland Zone will include the laying of the ballast, ties, and track and re-stripping of the existing paved lots. All work areas are existing, disturbed non-vegetated areas.

1. No principal or accessory buildings are proposed.

2. No piers are proposed.

3. No vegetative clearing is proposed within 75 feet of MHW. Clearing will be limited to limbing of trees and shrubs outside the 75 feet of MHW.

4. Erosion and sedimentation control: See attached Erosion and Sedimentation Control Plan.

5. The proposed development is located entirely on existing developed soils. The proposed use/impact will be far less than the previous standard gauge railroad tracks (see soils map).

6. The placement and operation of the MNGRR will not result in any direct detrimental impacts to water quality.

7. Approximately 600 feet of the MNGRR will run below the historic Fort Alan Park. An application of appropriateness was submitted for approval to the Portland Historic Preservation Committee on June 6, 1994.

8. There will be no new installation of public services.

9/10. The proposal exceeds the shoreline setback standards of this section of the ordinance.

11. Construction of the proposed improvements will not result in any increase in stormwater runoff entering Casco Bay.

12. Agricultural standards are not applicable to this project.

13. The general site plan features of this project conform with the standards of the municipal ordinance.

EROSION AND SEDIMENTATION CONTROL PLAN
MAINE NARROW GAUGE RAIL ROAD, PORTLAND ME

The following plan for controlling sedimentation and erosion from this project is based upon sound conservation practices as those outlined in the Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices, (March 1991) and Recommended Practices of the USDA Soil Conservation Service. Please refer to these sources and the Erosion Control Plan and Details included within the plan set.

GENERAL EROSION AND SEDIMENTATION CONTROL PRACTICES

The following general erosion control practices will be used to prevent erosion and sedimentation before, during and after the construction of this project. Special care shall be used at all times in an effort to:

1. limit disturbance and hence erosion
2. correct any erosion problems immediately
3. regularly monitor the practices implemented and
4. re-vegetate disturbed areas, if any, as soon as possible

Haybales and/or Silt Fence

Haybales or silt fencing shall be installed at the existing culvert and catch basin inlets, and along the downhill perimeter of the rail road bed.

The locations requiring haybales and/or silt fence are shown on the plans. This erosion protection is not limited to only these areas and may be required elsewhere as directed by City Engineer or the Project Designer.

Inlet Protection

All culvert inlets shall be protected as noted on the plans with haybales or silt fence to prevent any erosion that may occure.

CONSTRUCTION PHASE

General

The following general practices will be used to prevent erosion during construction of this project.

1.. Prior to the start of construction in a specific area, silt fencing and/or haybales will be installed around culverts, at the toe of slope and in areas as located on the plans to protect against any construction related erosion.

2.. All disturbed areas expected to remain longer than 7 days shall be either:
   a. Treated with mulch immediately, or
   b. Seeded with conservation mix of annual rye grass (0.9 lbs/1000 s.f.) and mulched immediately.

3. Application of mulch shall consist of straw mulch, hydro-mulch or any suitable substitute deemed acceptable by the Project Designer.
   a. Straw mulch shall be applied at a rate of 1 1/2 to 2 bales per unit. Straw mulch shall be secured by tacked photo degradable/biodegradable netting on grades greater than 5%.
   b. Hydro-mulch shall consist of a mixture of either asphalt, wood fiber or paper fiber and water sprayed over a seeded area. Hydro-mulch shall not be used between 9/15 and 4/15.

4. The following slope stabilization practices shall apply:

Slopes	Stabilization
3:1 and gentler	Seed and Mulch
2:1 - 3:1	Photo degradable/biodegradable netting or hydroseeding
2:1 or greater	Erosion Control Matting

MONITORING SCHEDULE

The contractor shall be responsible for installing, monitoring, maintaining, repairing, replacing and removing all of the erosion and sedimentation controls or appointing a qualified subcontractor to do so.

Maintenance measures will be applied as needed during the entire construction cycle. After each rainfall, a visual inspection will be made of all erosion and sedimentation controls to insure their continuing function as designed.

1. Hay bale barriers and silt fence shall be inspected and repaired once a week or immediately following any significant rainfall. Sediment trapped behind these barriers shall be excavated when it reaches a depth of 6" and redistributed to areas undergoing final grading. Should the hay bale barriers prove to be ineffective, the contractor shall replace them and reinforce them with silt fencing.

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William L. Petitjean
P.O. Box 1118
Fall City, WA 98024

June 6, 1994

Chairwoman Jadine O'Brien
Portland Planning Board
389 Congress Street
Portland, ME 04101

Dear Mrs. O'Brien:

I am writing this letter on behalf of the Maine Narrow Gauge Railroad Company and Museum (MNGRRC & M). I am an associate member of the Museum, one of the many professional volunteers working to insure the success of this Museum. My objective is to completely describe the combustion processes that will occur during the MNGRRC & M's proposed use of coal-fired steam locomotives along the Eastern Promenade. The scope of my discussion will first generally describe coal and its combustion, then focus on the specific process of coal combustion in the small historical locomotives owned by the MNGRRC & M.

COAL AND ITS COMBUSTION

Coal is a naturally occurring, carbonaceous fossil fuel that results from the geologic compression and transformation of decaying plant matter over great periods of time. In its youngest form, coal is called "lignite" and is not far removed from peat--the bogs in which all coal formation begins. Coal, in its oldest form is called "anthracite" and has been compressed to more than 90% pure carbon--the beginning stages of diamond formation.

Since coal is a compressed means of storing the solar energy captured by all plant life during photosynthesis, its combustion is a natural extension of the wildfires that have occurred in wooded sections of the country since the beginning of time.

Bituminous coal (midway between lignite and anthracite) deposits are abundant throughout the United States, and the recorded combustion of these fuels dates back to colonial times. The dawn of the steam-powered industrial age in the 19th century accelerated the use of coal greatly, and by 1928 approximately 600 million tons were mined in the United States. Approximately 25% of this production was used as railroad fuel--primarily to power steam locomotives that were contemporary with the locomotives now in the MNGRRC & M collection.

Unlike petroleum fuels, coal is not a highly refined fuel. Processing coal is usually limited to washing to remove ash and heavy impurities, double screening to remove oversized and undersized pieces from a particular grade and grading by particle size to meet the firing criteria of the furnace burning the coal. However, in many cases coal has been, and still is, burned as a run-of-mine product with no intermediate mechanical washing or sizing. This fact, coupled with the wide distribution of commercial coal deposits throughout the Eastern United States, insured that coal was the fuel of choice prior to World War II, during America's developing years. This dominance was yielded to fuel oils after mid-century, when development of oil distribution networks based at a handful of refineries provided cheap delivery of oil anywhere in America, thus replacing local coal sources that pre-dated national oil suppliers.

Because coal is produced by various geological processes and is not refined prior to use, the combustion results vary widely depending on the chemical make-up and cleanliness of a particular coal. The MNGRRC & M staff recognizes this and has made a considerable effort to develop a tight specification for locomotive coal that addresses the sensitive environmental issues raised by Portland citizens. The following description of the coal combustion process is based on a coal that meets this rigorous specification. It should be noted that many of the problems commonly associated with coal combustion are related to lower quality coals burned in a haphazard manner.

The proposed coal that meets the MNGRRC & M specification is a low sulfur, Pocahontas coal from the West Virginia coal fields. It is classed as a semi-bituminous coal and is described by the 1928 revision of Steam Power Plant Engineering:

> *"It has a high heating value, low moisture, ash, and sulfur content, burns freely without producing objectionable smoke and ranks among the best steaming coals in the world. The volatile matter in semi-bituminous coals is of remarkably uniform composition and approaches methane (CH_4 - the chief component of natural gas) in its analysis."*

This coal can be purchased and shipped in appropriately small quantities--an important factor that helps prevent weather slacking in storage that breaks the larger lumps into fines, thus aggravating particulate emissions from hand-fired furnaces. The analysis of this coal, as fired, is:

Moisture	3.82%
Ash	5.77%
Volatile Matter	16.38%
Fixed Carbon	74.03%
Sulfur	0.55%
TOTAL	100.00%
BTU/16	14.207

The ultimate analysis of this coal lists the elements and their percentages corrected to a dry basis:

Ash	5.75%
Hydrogen	4.37%
Carbon	84.61%
Nitrogen	1.36%
Sulfur: inorganic	0.11%
organic	0.61%
Oxygen	3.19%
TOTAL	100.00%

It should be noted that all the inorganic sulfur remains in the ash after combustion; therefore, only 85% of the total sulfur actually shows up in the furnace chimney emissions.

Also, separate analysis shows a 0.07% quantity of chlorine in the coal. However, all of this element is converted to Hydrochloric acid (HCl) during combustion. Thus, chlorinated hydrocarbons are not present in stack gases produced by complete combustion. Furthermore, this 700 parts-per-million concentration of chlorine products is probably at, or below, the background levels associated with chlorinated household products, hot tubs, swimming pools and municipal water supplies.

The combustion of coal is identical to all other fossil fuels in one important aspect: All fuel combustion requires approximately 7.5 lbs. or air per 10,000 BTU's of heat released at stoichometric conditions. This means that all fuels, regardless of type (solid, liquid or gaseous), roughly consume the same amount of air for a given heat release. More importantly, the proposed mitigation of MNGRRC & M emissions should be tempered by the probability that day-to-day variations in combustion air consumption in the Greater Portland area, far exceed the total daily air consumption of all MNGRRC & M fuel burning devices.

If the above coal is burned completely in a hand-fired furnaces, the combustible elements: carbon, hydrogen and sulfur, are oxidized at high temperatures in the presence of oxygen (air equals 23% oxygen and 77% nitrogen) to produce heat (exothermic reaction) and the following products of combustion: CO_2, carbon dioxide, H_20, water, sulfur dioxide and sulfur trioxide, SO_2 & SO_3 free nitrogen, N_2 and ash. Hand-fired coal furnaces do not operate at high enough temperature or loads to produce the NOX group that is commonly associated with internal combustion engines. Therefore, all nitrogen in the fuel and combustion air is emitted as stable, inert N_2.

It is important to remember that matter can neither be created or destroyed--the elemental balance must be maintained throughout the combustion process. However, the particular combination of these elements into compounds in the stack gases is subject to wide variation from the above description, depending on the nature of the combustion process. The Planning Board has asked to know the chemical composition compounds that will exit

MNGRRC & M locomotive stacks and the following pages excerpts from parts 43 & 56 and Tables 11, 12 & 17 of Steam Power Plant Engineering accurately answer these questions.

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STEAM POWER PLANT ENGINEERING

BY
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SIXTH EDITION, 1923 REVISION
TOTAL ISSUE, FIFTY-SEVEN THOUSAND

NEW YORK
JOHN WILEY & SONS, INC.
LONDON: CHAPMAN & HALL, LIMITED

56. Loss Due to Visible Smoke. — Soot is formed by the incomplete combustion of the hydrocarbon constituents of a fuel. All hydrocarbons are unstable at furnace temperatures, and unless air to insure complete combustion is mixed with them at the time they are distilled, they are quickly decomposed, the ultimate product consisting mostly of soot, H_2 and CO. Soot is formed at the surface of the fuel bed by heating the hydrocarbons in absence of air; it is not formed by the hydrocarbons striking the comparatively cool heating surface of the boiler. As a matter of fact, only a small trace of hydrocarbon gases reaches the boiler heating surface, provided there is a supply of air above the fire; hydrocarbons that do so are prevented from decomposition by the reduction in temperature due to contact. Once formed, it is difficult to burn it in the atmosphere of the furnace, because the oxygen is greatly rarefied, the gases containing only a few per cent of free oxygen.

Experience with burning soft coal shows that, if soot is once formed, a large percentage remains floating in the gases after all the other gaseous combustibles have been completely burned. Part of the soot is deposited on the tubes and throughout the boiler setting, while the rest is discharged through the stack with the gaseous products of combustion. A smoky chimney does not necessarily indicate an inefficient furnace, since the fuel loss due to visible smoke seldom exceeds 1 per cent. See Table 15. As a matter of fact, a smoky chimney may be much more economical than one that is smokeless. Thus, a furnace operating with very small air excess may cause considerable visible smoke and still give a higher evaporation than one made smokeless by a very large air excess. There will be some loss due to CO, unburned hydrocarbons, and soot in the former case, but in the latter this may be offset by the excessive loss caused by the heat carried away in the chimney gases. In general, however, smoky chimneys indicate serious losses, not because of the soot, but on account of the unburned, invisible combustible gases. (See Table 17.) The loss under this paragraph heading refers strictly to the visible combustible discharged up the stack and not that deposited on the tubes and in various parts of the setting. With natural draft the latter seldom exceeds a fraction of 1 per cent of the heat value of the fuel.

In case of very high rate of combustion under forced draft, the loss due to combustible in the cinders may range as high as 10 per cent or more. A well-designed furnace, properly operated, will burn many coals without smoke up to a certain rate of combustion. Further increase in the amount burned will result in smoke and lower efficiency due to deficient furnace capacity. Small sizes of coal ordinarily burn with less smoke than larger sizes, but develop lower capacities. In the average hand-fired furnace, washed coal burns with lower efficiency and makes more smoke than raw

coal. Most coals that do not clinker excessively can be burned with a smaller percentage of black smoke than those which clinker badly. For means of determining smoke density, see paragraph 354.

TABLE 15

QUANTITY AND HEAT VALUE OF SOLIDS IN VISIBLE SMOKE

(Bituminous Coal)

From the Report of the Chicago Association of Commerce Committee of Investigation on Smoke Abatement. (1912)

Test Number	Smoke Density Per Cent	Solids in Visible Smoke	
		Per Cent by Weight of Fuel Fired	Per Cent of the Heat Value of the Fuel Fired
Fires with High Smoke Density			
3	21.97	0.83	0.28
17	20.00	0.75	0.36
10	20.00	1.10	0.95
30	15.80	0.65	0.49
29	14.50	0.82	0.49
Average	18.45	0.63	0.51
Fires with Low Smoke Density			
56	0	0.51	0.21
57	0	0.30	0.08
80	0	4.07	0.74
81	0	1.81	0.48
85	0	0.47	0.11
Average	0	0.47*	0.32

* Average of 10 plant tests not including Test No. 80.

TABLE 16

CHEMICAL COMPOSITION OF THE SOLID CONSTITUENTS OF SMOKE

(Chicago Association of Commerce.)

Kind of Fuel	Per Cent of Total Solids				
	Hydrocarbons (Tar)	Combustible Solids (Carbon)	Mineral Matter (Ash)	Sulphur	Total
High-pressure Plants					
Pocahontas	3.08	41.45	52.39	3.08	100
Bituminous	4.19	32.80	59.93	3.08	100
Low-pressure Plants					
Anthracite	0.73	31.88	67.39	0.0	100
Pocahontas	11.43	54.90	33.47	0.20	100
Bituminous	31.43	44.06	22.12	2.39	100

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TABLE 17

ANALYSIS OF CHIMNEY GASES

Boiler	Smoky						Clear					
	CO_2	O_2	CO	CH_4	H_2	N_2	CO_2	O_2	CO	CH_4	H_2	N_2
No. 1, hand-fired	11.00	6.90	0.90	.....	.....	81.20	.....	.....	.....	.....	...	.....
	10.65	6.45	2.15	.....	.....	80.75	.....	.....	.....	.....	...	.....
No. 1, with smoke-prevention device	.....	.....	.....	.....	.....	.....	7.00	13.50	0	.....	....	79.50
							9.00	9.75	0	.....	....	81.25
No. 2, hand-fired	10.25	8.60	.50	0	0	80.65	.....	.....	.....	.....	...	.....
No. 3, hand-fired	13.25	3.50	.05	0.25	0	82.95	.....	.....	.....	.....	...	.....
No. 4, fire under caustic pot, hand-fired	10.95	1.30	3.00	.70	3.23	80.82	.....	.....	.....	.....	...	.....
No. 5, split bridge, hand-fired	8.75	7.00	3.25	.40	1.00	79.60	.....	.....	.....	.....	...	.....
No. 6, with smoke-prevention device	.....	.....	.....	.....	.....	.....	7.25	12.00	0	0	0	80.75
No. 7, with smoke-prevention device	.....	.....	.....	.....	.....	.....	7.15	12.15	0	0	0	80.70
No. 8, with smoke-prevention device	.....	.....	.....	.....	.....	.....	8.15	11.10	0	0	0	80.75

57. Radiation and Unaccounted For. — These losses are usually determined by difference. That is, the difference between the heat represented in the steam and the sum of the losses just mentioned is charged to "unconsumed hydrogen and hydrocarbons, to radiation, and unaccounted for." Unless accurate observations have been made in determining the various factors entering into the heat balance, the "radiation and unaccounted for" loss may represent a large percentage of the total heating value of the coal. Careful tests on *well-designed* boiler furnaces show that the radiation loss seldom exceeds 2 per cent.[1] In case of very poorly installed settings or when the rate of driving is very low, the radiation loss may be considerably more than this. An examination of the data from carefully conducted tests of modern boiler furnaces will show that the "radiation and unaccounted for" items range from 2 to 6 per cent with an average of about 4 per cent. Soot deposited on the boiler tubes and throughout the setting, and cinders blown out of the stack under high draft pressures may greatly increase the unaccounted for loss, unless means are available for determining these factors.

58. Heat Balance. — Any chart giving the distribution of the various heat items constitutes a heat balance. The greater the number of subdivisions the more readily is it possible to locate the source of loss. In everyday furnace practice a determination of the heat balance is seldom

[1] *Heat Losses from Boiler Furnace Walls:* Power Plant Engrg., Sept. 15, 1925, p. 941.

43. Combustion of a Mixture of Elements. — All commercial fuels consist of a mixture of elements existing either in the free state or in combination with each other. The minimum theoretical weight of air required to completely burn any fuel is the same whether the combustible elements are free or combined; but the heat of combustion of a chemical compound may differ considerably from that based on the heat value of its constituent elements, because of the heat absorbed or given up in the creation of the compound. The character and distribution of the products of combustion depend upon the nature of the fuel, the air supply, and the conditions under which combustion took place. In practically all the furnaces, the combustion of solid fuels takes place in two stages: (1) Combustion in the fuel bed, which includes the distillation of volatile matter and partial combustion or gasification of the fixed carbon; and (2) combustion of the gaseous and other combustibles rising from the fuel bed in the combustion space. With liquid fuels, evaporation and gasification precede ignition and combustion, while with gaseous fuels ignition takes place as soon as the fuel and air mixture has reached the proper temperature for chemical union.

The various steps in the combustion of a bed of coal of uniform thickness on a stationary grate are shown in Fig. 13. At the bottom of the

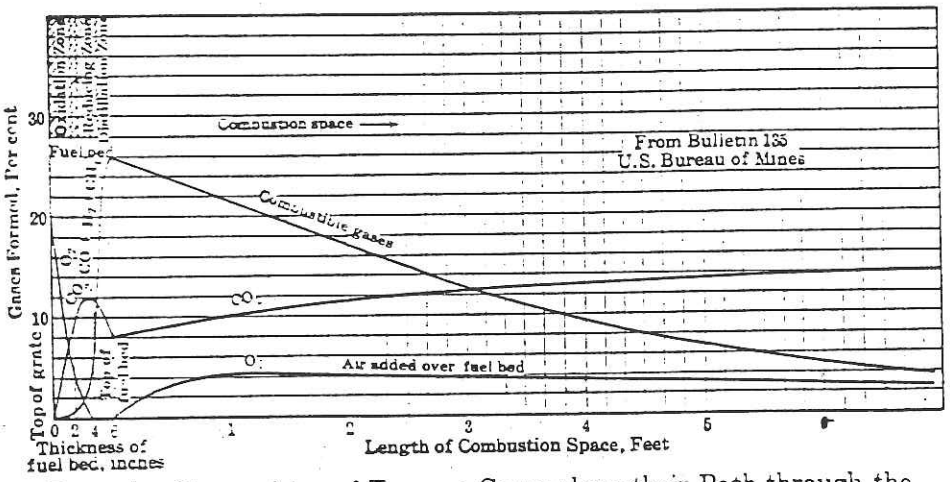

FIG. 13. Composition of Furnace Gases along their Path through the Combustion Space — Hand-fired Furnace.

fuel bed, where the air first comes in contact with the coal, the air contains approximately 21 per cent of oxygen, and the fuel bed but little combustible. As the air passes up through the layer of fuel next the grate, the oxygen in it combines with the carbon of the coal, forming CO_2. The rate of oxidation in the lower part of the fuel bed depends almost entirely on the rate at which air flows through it. The greater the quantity of air that is forced through the fuel bed the faster the coal is oxidized

When the free oxygen is all used up, the resulting CO_2, on continuing its passage through the superposed unburned portion of the coal bed, is reduced to CO. The rate of reduction of CO_2 to CO depends upon the temperature of the fuel bed — the higher the temperature the faster the CO_2 is reduced to CO. At the high temperature existing in the average fuel bed, a considerable portion of the CO_2 is reduced. The layer at the top of the fuel bed consists mostly of fresh fuel which is being heated and from which the volatile matter is being distilled. With a given temperature, the distillation is independent of the air supply, since the heated volatile matter distills off whether air is supplied or not. On the other hand, fixed carbon in a fuel bed cannot be burned to CO_2 or gasified to CO unless air is supplied over the grate. The gases rising from the fuel bed contain a high percentage of combustible, and no free oxygen, irrespective of the rate at which air is forced through the fuel bed. Therefore, complete combustion cannot be obtained from the air passing through the bed unless there are holes in the fire or part of the fuel on the grate is burned out. To effect complete combustion with an even fuel bed of unburned coal, part of the air must be supplied above the fire and in such a manner that it will mix with the combustible gases. This applies to all solid fuels.

Part of the moisture in a fuel and part of that brought in with the air for combustion pass through the furnace as highly superheated steam. That part of the moisture which comes into contact with the incandescent carbon combines with the carbon to form CO, CO_2, and H_2, thus

$$H_2O + C = CO + H_2$$
$$2\,H_2O + C = CO_2 + 2\,H_2$$

Under average boiler-furnace conditions, the H_2 thus liberated will ultimately recombine with O_2 and form H_2O. See also paragraph 100.

Powdered, liquid and gaseous fuels are burned in suspension and are, therefore, not subject to the limitations outlined above. Almost perfect combustion can be effected with these fuels in a comparatively small space, provided the air and fuel are thoroughly mixed. Intense turbulence of the mix is essential to rapid combustion and short flames. With powdered fuel, turbulence not only accelerates contact between fuel and air, but also sweeps away the inert gas envelope surrounding the partly burned fuel particle and brings in a fresh supply of oxygen.

44. Air Theoretically Required for Perfect Combustion. — As previously stated, the minimum weight of air required to completely burn any fuel is the same whether the combustible elements are in the free state or in chemical combination with each other. If C, H, O, S, repre-

in which the elements are designated by symbols, the relative volumes of the gaseous constituents by numerical coefficients, and the number of times the atomic weight occurs by subscripts. The symbols, relative atomic and molecular or combining weights, and the chemical reactions for the elements and compounds generally encountered in combustion work are given in Table 11.

Flame Temperatures, by Prof. W. Trinks, Power, June, 1923.
Combustion Phenomena, by E. Kieft, Combustion, Nov., 1923. p. 390.

TABLE 10

IGNITION TEMPERATURE, DEG. FAHR.

Acetylene	900	Ethylene, CH	1020
* Anthracite Coal	1112	Hydrogen	1130
* Bituminous Coal	850	* Lignite	979
* Coke	1123	Methane CH	1200
Carbon Monoxide	1200	* Semi-Bit. Coal	980
Ethane CH	1000	Sulphur	470

* Glow point.

TABLE 11

DATA RELATIVE TO ELEMENTS MOST COMMONLY MET WITH IN CONNECTION WITH COMBUSTION OF FUELS

Substance	Chemical Symbol	Relative Combining Weight ($O_2 = 32$)		Chemical Reaction	Heating Value B.t.u. per Lb.	
		Exact	Approx.		Higher	Lower
Acetylene	C_2H_2	26.03	26	$2\,C_2H_2 - 5O_2 = 4\,CO_2 - 2\,H_2O$	21,600	21,000
Carbon to CO_2	C	12.00	12	$C + O_2 = CO_2$	14,600	14,600
Carbon to CO	C	12.00	12	$2\,C + O_2 = 2\,CO$	4,440	4,440
Carbon monoxide	CO	28.00	28	$2\,CO + O_2 = 2\,CO_2$	4,354	4,354
Ethane	C_2H_6	30.05	30	$2\,C_2H_6 + 7\,O_2 = 4\,CO_2 - 6\,H_2O$	22,230	20,500
Ethylene	C_2H_4	28.03	28	$C_2H_4 - 3\,O_2 = 2\,CO_2 - 2\,H_2O$	21,500	20,420
Hydrogen	H_2	2.016	2	$2\,H_2 - O_2 = 2\,H_2O$	62,100	52,920
Methane	CH_4	16.03	16	$CH_4 - 2\,O_2 = CO_2 - 2\,H_2O$	23,850	21,670
Sulphur to SO_2	S	32.06	32	$S + O_2 = SO_2$	4,000	4,000
Sulphur to SO_3	S	32.06	32	$2\,S + 3\,O_2 = 2\,SO_3$	5,940	5,940

Gas	Chemical Symbol	Relative Combining Weight $O_2 = 32$		Density and Volume*		Air Required for Perf. Combus.†		Heating Value per Cu. Ft.*	
		Exact	Approx.	Lb. per 100 Cu. Ft.	Cu. Ft. per Lb.	Lb. per Lb. of Gas	Cu. Ft. per Cu. Ft. of Gas	Higher	Lower
Acetylene	C_2H_2	26.03	26	6.76	14.79	13.35	11.90	1460	1420
Carbon monoxide	CO	28.00	28	7.27	13.75	2.48	2.38	315	318
Ethane	C_2H_6	30.05	30	7.52	12.75	16.16	16.70	1735	1600
Ethylene	C_2H_4	28.03	28	7.30	13.70	14.35	14.30	1573	1491
Hydrogen	H_2	2.016	2	0.52	192.0	34.80	2.38	325	278
Methane	CH_4	16.03	16	4.16	24.00	17.32	9.52	992	902
Air	‡	28.95	29	7.52	13.30				
Carbon dioxide	CO_2	44.00	44	11.43	8.75				
Nitrogen	N_2	28.02	28	7.28	13.74				
Oxygen	O_2	32.00	32	8.31	12.03				
Sulphur dioxide	SO_2	64.07	64	16.65	6.00				

* 68 deg. fahr. and atmospheric pressure. † See paragraph 44. ‡ Equivalent to $O_2 + 3.82\,N_2$.

coal. Most coals that do not clinker excessively can be burned with a smaller percentage of black smoke than those which clinker badly. For methods of determining smoke density, see paragraph 354.

TABLE 15

QUANTITY AND HEAT VALUE OF SOLIDS IN VISIBLE SMOKE

(Bituminous Coal)

From the Report of the Chicago Association of Commerce Committee of Investigation on Smoke Abatement. (1912)

Test Number	Smoke Density Per Cent	Solids in Visible Smoke	
		Per Cent by Weight of Fuel Fired	Per Cent of the Heat Value of the Fuel Fired
Fires with High Smoke Density			
3	21.97	0.83	0.28
17	20.00	.75	0.36
10	20.00	.0	0.95
30	15.8	0.	0.49
29	1.60	0.82	0.49
Average	18.45	0.63	0.51
Fires with Low Smoke Density			
[illegible]	0	0.51	0.21
57	0	0.30	.08
80	0	4.07	
81	0	1.81	0.
85	0	0.47	0.11
Average	0	0.47*	0.32

Table 16

TABLE 16

CHEMICAL COMPOSITION OF THE SOLID CONSTITUENTS OF SMOKE

(Chicago Association of Commerce.)

Kind of Fuel	Per Cent of Total Solids				
	Hydrocarbons (Tar)	Combustible Solids (Carbon)	Mineral Matter (Ash)	Sulphur	Total
High-pressure Plants					
Pocahontas	3.08	41.45	52.39	3.08	100
Bituminous	4.19	32.80	59.93	3.08	100
Low-pressure Plants					
Anthracite	0.73	31.88	67.39	0.0	100
Pocahontas	11.43	54.90	33.47	0.20	100
Bituminous	31.43	44.06	22.12	2.39	100

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ANAL

Boiler	CO_2	O_2	
No. 1, hand-fired	11.00	6.90	0
	10.65	6.45	2
No. 1, with smoke-prevention device			
No. 2, hand-fired	10.25	3.60	
No. 3, hand-fired	13.25	3.50	
No. 4, fire under caustic pot, hand-fired	10.95	1.30	3
No. 5, split bridge, hand-fired	8.75	7.00	3
No. 6, with smoke-prevention device			
No. 7, with smoke-prevention device			
No. 8, with smoke-prevention device			

57. Radiation and Unaccou
mined by difference. That
sented in the steam and the
"unconsumed hydrogen and
for." Unless accurate obser
various factors entering into
counted for" loss may repr
value of the coal. Careful t
the radiation loss seldom ex
stalled settings or when the
may be considerably more t
carefully conducted tests of
"radiation and unaccounted
an average of about 4 per c
throughout the setting, and
draft pressures may greatly
means are available for dete

58. Heat Balance. — Any
heat items constitutes a hea
divisions the more readily i
everyday furnace practice a

[1] *Heat Losses from Boiler Furn*

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DS IN VISIBLE SMOKE
al)
merce Committee of Investigation on
1912)

Solids in Visible Smoke	
Cent by Weight of Fuel Fired	Per Cent of the Heat Value of the Fuel Fired
Density	
0.83	0.28
0.75	0.36
1.10	0.95
0.65	0.49
0.82	0.49
0.63	0.51
Density	
0.51	0.21
0.30	0.08
4.07	0.74
1.81	0.48
0.47	0.11
0.47*	0.32

cluding Test No. 80.

6
D CONSTITUENTS OF SMOKE
Commerce)

Solids		
Mineral Matter (Ash)	Sulphur	Total
lants		
52.39	3.08	100
59.93	3.08	100
lants		
67.39	0.0	100
33.47	0.20	100
22.12	2.39	100

Table 17 B-37

TABLE 17

ANALYSIS OF CHIMNEY GASES

Boiler	Smoky						Clear					
	CO_2	O_2	CO	CH_4	H_2	N_2	CO_2	O_2	CO	CH_4	H_2	N_2
No. 1, hand-fired	11.00	6.90	0.90	.....	.....	81.20	.....	.....	.....	.....	.....	.....
	10.65	6.45	2.15	.....	.....	80.75	.....	.....	.....	.....	.....	.....
No. 1, with smoke-prevention device	.....	.....	.....	.....	.....	.....	7.00	13.50	0	.....	.....	79.50
	.....	.....	.....	.....	.....	.....	9.00	9.75	0	.....	.....	81.25
No. 2, hand-fired	10.25	8.60	.50	0	0	80.65	.....	.....	.....	.....	.....	.....
No. 3, hand-fired	13.25	3.50	.05	0.25	0	82.95	.....	.....	.....	.....	.....	.....
No. 4, fire under caustic pot, hand-fired	10.95	1.30	3.00	.70	3.23	80.82	.....	.....	.....	.....	.....	.....
No. 5, split bridge, hand-fired	8.75	7.00	3.25	.40	1.00	79.60	.....	.....	.....	.....	.....	.....
No. 6, with smoke-prevention device	.....	.....	.....	.....	.....	.....	7.25	12.00	0	0	0	80.75
No. 7, with smoke-prevention device	.....	.....	.....	.....	.....	.....	7.15	12.15	0	0	0	80.70
No. 8, with smoke-prevention device	.....	.....	.....	.....	.....	.....	8.15	11.10	0	0	0	80.75

57. Radiation and Unaccounted For. — These losses are usually determined by difference. That is, the difference between the heat represented in the steam and the sum of the losses just mentioned is charged to "unconsumed hydrogen and hydrocarbons, to radiation, and unaccounted for." Unless accurate observations have been made in determining the various factors entering into the heat balance, the "radiation and unaccounted for" loss may represent a large percentage of the total heating value of the coal. Careful tests on *well-designed* boiler furnaces show that the radiation loss seldom exceeds 2 per cent.[1] In case of very poorly installed settings or when the rate of driving is very low, the radiation loss may be considerably more than this. An examination of the data from carefully conducted tests of modern boiler furnaces will show that the "radiation and unaccounted for" items range from 2 to 6 per cent with an average of about 4 per cent. Soot deposited on the boiler tubes and throughout the setting, and cinders blown out of the stack under high draft pressures may greatly increase the unaccounted for loss, unless means are available for determining these factors.

58. Heat Balance. — Any chart giving the distribution of the various heat items constitutes a heat balance. The greater the number of subdivisions the more readily is it possible to locate the source of loss. In everyday furnace practice a determination of the heat balance is seldom

[1] *Heat Losses from Boiler Furnace Walls:* Power Plant Engrg., Sept. 15, 1925, p. 941.

The previous excerpts from this venerable, contemporary textbook illustrate two important points: The first point shows that coal can be burned as cleanly as other commercial fuels if it is properly injected into the boiler and the combustion air is fed under, and over the firebed in the current proportions; the second point rests on the fact that this old text (1928) directly addresses the fuel questions posed by the Portland Planning Board today. Thus, we all can see that much time and money was committed long ago to understanding the coal combustion process and the issues surrounding smoke and emissions in urban areas. This is not a new and novel controversy, it is merely an extension of old arguments that are being re-visited.

In conclusion, the foregoing general description of coal combustion shows that careful specification of the best semi-bituminous coal and equally careful attention to its combustion, can produce a coal furnace operation that has the following emission features:

- far lower unburned hydrocarbon concentrations than I.C. engines and airplane engines can achieve without catalytic converters
- far lower soot emissions than visibly apparent from unregulated diesel engines
- none of the NOX emissions commonly associated with all I.C. engines and airplane engines
- sulfur compound emissions below the allowable standards for furnace oil burners and diesel engines

The key element in this conclusion is "care" and "vigilance" because a coal fire is analogous to the ubiquitous, backyard barbecue. If the clean-burning, well-ventilated charcoal fire is loaded with drippings from the cooking meat, then the lid is put on the kettle to restrict combustion air, the result will be the well known column of toxic, unburned hydrocarbons that inform the neighbors that the outdoor cooking season has arrived. If the MNGRRC & M locomotives are fired with bright, well-ventilated fires, their emissions will be much less significant than the barbecues and gasoline lawnmowers of those citizens who would oppose the Narrow Gauge railway's rightful place as a Portland institution.

COAL COMBUSTION IN NARROW GAUGE STEAM LOCOMOTIVES

The combustion of coal in steam locomotives is a special case because they are mobile steam power plants that are severely restricted by limited height, width and weight constraints. These limitations adversely affect locomotive boiler proportions and forced locomotive designers to accept small grate areas and furnace volumes. However, the high demand for steam by the cylinders pulling heavy loads contradicted the boiler limits and

most steam locomotives required firing rates that far exceeded accepted stationary practice in order to keep adequate steam pressure. The result of these excessive firing rates was significant particulate emissions and carbon loss up the stack. But these emissions only occurred during heavy pulls (uphill) and at high speeds.

Despite this contradictory description, vast improvements in steam locomotive combustion practices were made between 1900 and 1950, and although locomotive practice never approached the relative efficiencies common in stationary, coal burning boilers, many large railroads combined these improvements with aggressive smoke abatement programs to reduce nuisance smoke in urban areas. However, the variations in coal quality and the imperfect response of human firemen made the complete elimination of smoke impossible; therefore, all coal fired steam locomotives will smoke on occasion.

The MNGRRC & M locomotives are small, narrow gauge industrial locomotives. The heaviest engine weighs 35 tons, compared to 600 tons for the heaviest main line steam locomotives. These little engines represent locomotive coal combustion technology that was common over a 50-year period, from 1875 to 1925, when hand fired boilers dominated the railroad industry. They do not represent "state-of-art" because the limited financial resources of their previous owners, the rural character of their service territories and low overall fuel consumption did not encourage improvements that appeared on newer, larger engines.

The proposed operation of these engines in the Portland area will be characterized by light loads, low speeds and low mileage's, when compared with operations at the Edaville Railroad in Massachusetts and the Edaville precedents in Maine. Present planning estimates a maximum of 4 round trips with the steam train per day; each round trip equals 2.8 miles. The total mileage per day will equal 14 miles. The traditional fuel consumption estimates for these two foot gauge locomotives is 40 lbs. per mile, including fire starting and standby. This translates into 448 lbs. of coal consumed per day by the MNGRRC & M.

It must be noted here that this consumption is an estimate and should be confirmed by records of actual operations after start up.

Four diesel trucks, operating about 46 miles each per day will consume an equivalent amount of fuel. Furthermore, all the ash, sulfur and other impurities found in diesel fuel, plus soot, will be ejected in the exhaust stream of these trucks as easily aspirated sub-micron particles. The ash fraction from the coal burning steam locomotives will be largely captured as solid waste in the ash pan, and will be properly disposed. Ash ejected from the stack will be macroscopic sizes that cannot be aspirated because the hand firing of lump coal does not produce sub micron size particles. Fuel oil is atomized into fine mist that creates the finely divided ash particles that remain airborne indefinitely. The MNGRRC & M locomotives will be operating at a fraction of their capacity (10-12 car

trains on the Edaville vs. 2-3 car trains on the MNGRRC & M). Therefore, the popular image of visible smoke consisting of particulate and carbon will be minimal because firing rates will be very low.

An important characteristic of the present furnace configuration on MNGRRC & M locomotives is the inability to introduce combustion air over the firebed. A review of the earlier excerpts from Steam Power Plant Engineering will confirm that this arrangement tends to produce unburned hydrocarbons and soot. Very careful "cross" firing by well-trained crews can reduce episodes of visible smoke and unburned hydrocarbons significantly.

If careful firing and good crew training proves inadequate, then a search of technology improvements on steam locomotives built after 1925 can yield information that may be adapted to these smaller locomotives. However, significant modifications to the boilers of these locomotives will alter their configurations, thus detracting from their artifact value. Nonetheless, modifications based on a technology search and engineered adaptations can yield some reduction in smoke emissions.

Since locomotives like the MNGRRC & M machines were never fitted with such a system, the MNGRRC & M must operate their locomotives as they are presently configured to establish base line criteria. Once this baseline is established, then an improvement program can be started, if necessary.

The overall success of hand fired furnace operations is a function of crew training. Because the engineer and fireman control all locomotive functions manually, they must be thoroughly trained. As the crews develop proficiency with the principle based skills once common throughout steam-powered America, then the MNGRRC & M will have gone a long way toward achieving consistent, complete combustion in their locomotives.

CONCLUSIONS

Overall conclusions based on the above material suggest the following:

1. The best low ash, low volatile, free burning steam coal should be purchased on a tight specification. Since coal quality varies greatly, the supplier must certify compliance with the specification.

2. The analyses and excerpts from Steam Power Plant Engineering show that it is possible to completely burn the above coal with less adverse impact on Portland air quality than other commercial fuels now being burned in the unregulated sector.

3. The MNGRRC & M locomotives are historic artifacts not presently in a "state-of-art" configuration. If in the course of operation "smoke" becomes an intolerable problem,

an organized development program and a reasonable time frame can reduce visible emissions to a more acceptable level.

4. Since all the MNGRRC & M steam locomotives are manually controlled, engine crews must receive training so they possess the skills and attitudes required to implement the above criteria and produce consistent, complete combustion.

I trust the above information is satisfactory. If the Board has any questions, please do not hesitate to contact me. I can be reached at Gilbert Manufacturing Corp. through June 24th. Their number is (207) 875-2301. After June 24th, I can be reached at (206) 222-7178 or (206) 222-6781.

Sincerely,

William L. Petitjean

WLP/sd

Attachment: resumé

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Susan Romatzick
Paladin Environmental
RR # 3 Box 430
Winthrop, Maine 04364

June 13, 1994

Mr. Stephen B. Mohr
Mohr & Seredin, Landscape Architects, Inc.
18 Pleasant Street
Portland, Maine 04101

Dear Steve,

I am writing as a follow-up to our conversation last Friday regarding my resume. As you can see by reading it, my specialty is really troubleshooting and providing technical assistance to wastewater treatment facilities. However, both in my course work background and as an instructor at Southern Maine Technical College, (SMTC), I do have some expertise in air pollution issues. During my undergraduate days at Rutgers University I took courses entitled "Principles of Air Pollution Control" and "Air Sampling and Analysis". In addition, I teach a course at SMTC entitled "Elements of Air Pollution Control and Solid Waste Management". In this SMTC course, I teach my students how to calculate, energy inputs, air pollutant emissions rates and how to construct and calculate conservative and non-conservative air quality models. These are the same types of calculations that are contained in my letter to the Portland Planning Board dated June 13, 1994.

In order to insure that any mistakes in either calculations or assumptions were avoided, I sought out Kathleen Molokie, an environmental engineer in the Licensing and Enforcement Division of the Maine Department of Environmental Protection's Air Bureau who reviewed my work. If you or anyone else have any other questions, or if I can be of any further assistance, please do not hesitate to contact me at my home. My telephone number there is 377-9634.

Yours truly,

Sue Romatzick

Susan Romatzick
Paladin Environmental

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Susan Romatzick
Paladin Environmental
RR # 3 Box 430
Winthrop, Maine 04364

June 13, 1994

Mrs. Jadine O'Brien, Chairperson
Portland Planning Board
389 Congress Street
Portland, Maine 04101

Dear Mrs. O'Brien:

I am writing at the request of Phineas Sprague with regard to air quality and air pollution issues surrounding the proposal by the Maine Narrow Gauge Railroad Co. and Museum to run a train between the India Street/Commercial Street intersection and Fish Point. My discussion of these issues will be broken down into two basic areas. First, I will be comparing the Maine Narrow Gauge Railroad Proposal to the Maine Department of Environmental Protection's, (DEP), Air Emissions Licensing Criteria. Secondly, I have developed two conservative air quality models and calculated the expected ambient air quality conditions that would occur under these two scenarios and compared these results with Maine's Ambient Air Quality Standards.

Over the past few weeks, I have had several discussions with staff from the DEP, in particular, Sandra Tate, Director, Portland Regional Office, Cathy Richardson, Environmental Specialist III, in the Air Bureau's Field Services Division and Kathleen Molokie, an Environmental Engineer in the Air Bureau's Licensing and Enforcement Division. In the generation of the numbers that follow in this letter, I have attempted to be as conservative as possible. For example, coal usage is based upon running the train in a mountainous area rather than in an area consisting of gentle slopes. The fuel usage for the diesel engines is based upon 125 horsepower engine running at full speed rather than the 100 horsepower engine pulling a train at a speed of 15 miles per hour. Based upon these fuel usage assumptions and my conversations with the DEP staff mentioned above, I offer the following information to the Portland Planning Board.

Potential air pollution sources are broken down into two basic categories. They are stationary sources and mobile sources. Mobile sources such as the Maine Narrow Gauge Railroad are exempt and thus not required to obtain an air emissions license from the DEP,(Chapter 115, II.C.4). For stationary sources, there are currently three basic standards against which the stationary source is compared to determine whether or not an air emission license is required.

The first standard is based upon total heat input available on-site. An air emission license is required if the total heat input of fuel-burning equipment is greater than or equal to 10

million British Thermal Units, (Btu), per hour, (Chapter 115, II.C.1). By comparison, the total heat input available if both diesel engines plus the coal fired engine were on-line at the same time would only be 2.63 million Btus per hour, (see Appendix I for calculations).

The second standard is for general process sources or equipment. An air emission license is required if under normal operation either 10 or more pounds per hour or 100 or more pounds per day of any regulated air pollutant is emitted, (Chapter 115, II.C.3). Contained in Table 1 below is a comparison of these standards with the emissions from both the coal engine and the diesel engine that will be used by the Maine Narrow Gauge Railroad. As one can see, none of the emissions for these air pollutants comes close to meeting the minimum standard that would require licensing by the DEP's Air Bureau if it were a stationary general process source. The emission rates are based on the use of 150 lbs of coal per hour and a maximum of 1200 pounds per day. For the 100 horsepower diesel engines, the emission rates are based upon a fuel usage of 1.5 gallons per hour and a maximum of 12 gallons per day. The actual emission rates for the sulfur dioxide, nitrogen dioxide and total suspended particulates from these engines were taken from Environmental Protection Agency Technical Data Tables generated for use by Air Quality Licensers in the estimation of air pollutant emissions. (Please see Appendix I for specific calculations.)

Table 1

Comparison of Coal and Diesel Engine Emissions by Maine Narrow Gauge Railroad to Maine DEP General Process Stationary Source Limits

	Sulfur Dioxide	Nitrogen Dioxide	Total Suspended Particulates
Maine Significant Air Pollutant Emission Rate	10 lb/h	10 lb/h	10 lb/h
	100 lb/d	100 lb/d	100 lb/d
Monson # 3 Coal Engine	1.5 lb/h	0.23 lb/h	1.13 lb/h
	12 lbs/d	1.8 lb/d	9.0 lb/d
100 Hp Diesel Engine	0.06 lb/h	0.9 lb/h	0.06 lb/h
	0.48 lb/d	7.3 lb/d	0.51 lb/d

The third basic standard utilized by the DEP to determine whether or not a stationary source is required to obtain an air emission license is based upon specific annual air pollutant emission rates. An air emission license is required if under

normal operation, the rate of emissions equals or exceeds any of the emission rates listed in Chapter 100, definition number 88. Contained in Table 2 below is a comparison of these standards with the emissions from both the coal engine and the diesel engine that will be used by the Maine Narrow Gauge Railroad. To calculate the numbers contained in Table 2, the information contained in Table 1 was utilized along with the estimation that the Maine Narrow Gauge Railroad will run a maximum of 300 days per year. It is expected that the coal engine will be used a maximum of 100 days per year and the diesel engines will be run the remaining 200 days per year. Once again, none of the emissions for these air pollutants comes close on an annual basis to meeting the minimum standard that would require licensing by the DEP's Air Bureau if it were a stationary source. (Appendix I contains specific calculations for Table 2.)

Table 2

Comparison of Annual Coal and Diesel Engine Emissions by Maine Narrow Gauge Railroad to Maine DEP General Process Stationary Source Limits

	Sulfur Dioxide (tons/yr)	Nitrogen Dioxide (tons/yr)	Total Suspended Particulates (tons/yr)
Maine Significant Air Pollutant Emission Rate	40	40	25
Monson # 3 Coal Engine			
run 100 days/year	0.6	0.09	0.45
run 300 days/year	1.8	0.27	1.35
100 Hp Diesel Engine			
run 200 days/year	0.05	0.73	0.05
run 300 days/year	0.07	1.10	0.077

With regard to the air quality modeling, these will be used to demonstrate what effect, if any, the running of the train with either the coal-fired or diesel-fired engine will have on inhabitants in the area. The two models are conservative. In other words, there is an assumption that no decay or accumulation of the particular air pollutants studied will occur. Emission rates for the various air pollutants are taken from information utilized to generate the data contained in Tables 1 and 2. In addition, the calculations and assumptions used in these two models were reviewed by Kathleen Molokie, a DEP Air Bureau Environmental Engineer before being submitted to the Portland

Planning Board.

In Air Quality Model Number 1, the width utilized is 1.5 miles, (the length of the railroad track), and the height of air that the pollutant is mixed with is 100 feet. In other words, an inversion that would prevent additional mixing with the larger air mass above a height of 100 feet is assumed. The wind speed is assumed to be blowing on-shore at 5 miles per hour. Because ambient air quality standards are all metric, the numbers used in the calculations are first converted from English to metric and then utilized in the model. Please see Appendix II for the actual calculations.

Table 3 contains a comparison of the Maine Primary Ambient Air Quality Standards to the projected ambient concentrations calculated for Air Quality Model # 1. Primary Ambient Air Quality Standards are intended to protect the weakest and most vulnerable individuals because everyone has to be able to breathe the air. Unlike water, people cannot go out and buy higher quality air to breathe. As one readily see based upon this model, none of the emissions for these air pollutants comes close to even equaling the Annual Primary Air Quality Standards let alone exceeding these standards. Although the likelihood of an inversion only 100 feet high occurring in this area is remote at best, this model was used to give the Portland Planning Board something that they could use to compare to existing Ambient Air Quality Standards.

Table 3

Comparison of the Effect of Coal and Diesel Engine Emissions by Maine Narrow Gauge Railroad to Maine DEP Ambient Air Quality Standards Using Air Quality Model # 1

	Sulfur Dioxide (ug/m^3)	Nitrogen Dioxide (ug/m^3)	Total Suspended Particulates (ug/m^3)
Maine Air Quality Limits			
Annual	57	100	60
24-Hour	230		150
3-Hour	1150		
Monson # 3 Coal Engine	1.15	0.17	0.86
100 Hp Diesel Engine	0.046	0.7	0.05

In Air Quality Model Number 2, the width utilized remains at 1.5 miles but the height of air that the pollutant is mixed with is changed to only 10 feet. In other words, an inversion that would prevent additional mixing with the larger air mass that exists above a height of 10 feet is assumed. The wind speed used in this model is still assumed to be blowing on-shore at 5 miles per hour. Once again, Appendix II contains the conversions and actual calculations for this model.

A comparison of the Maine Primary Ambient Air Quality Standards to the projected ambient concentrations calculated for Air Quality Model # 2 is contained in Table 4 below. Once again, none of the emissions for these air pollutants comes close to even equaling the Annual Primary Air Quality Standards let alone exceeding these standards. Although an inversion 10 feet off of the ground would never occur in this area, based upon conversations that I had with DEP Air Bureau personnel, this model to demonstrate the worst possible scenario for someone walking next to the train while it was in operation.

Table 4

Comparison of the Effect of Coal and Diesel Engine Emissions by Maine Narrow Gauge Railroad to Maine DEP Ambient Air Quality Standards Using Air Quality Model # 2

	Sulfur Dioxide (ug/m^3)	Nitrogen Dioxide (ug/m^3)	Total Suspended Particulates (ug/m^3)
Maine Air Quality Limits			
Annual	57	100	60
24-Hour	230		150
3-Hour	1150		
Monson # 3 Coal Engine	11.5	1.7	8.6
100 Hp Diesel Engine	0.46	7.0	0.50

This concludes my comments regarding the Maine Narrow Gauge Railroad Co. and Museum application. If you or anyone on the Portland Planning Board have any questions about anything stated in this letter or if I can provide any other information, please do not hesitate to contact me at my home, 377-9634. Thank you.

Sincerely yours,

Susan Romatzick

Susan Romatzick
Paladin Environmental

Susan Romatzick SR
Paladin Environmental

APPENDIX I

A. TOTAL HEAT INPUT AVAILABLE (Btu's/hr)

MONSON #3 COAL-FIRED ENGINE

$$\frac{150 \text{ lbs coal}}{\text{hr}} * \frac{14,771 \text{ Btu}}{\text{lb coal}} = 2,215,650 \text{ Btu/hour}$$

140 Hp DIESEL ENGINE

$$\frac{1.5 \text{ gal}}{\text{hr}} * \frac{138,000 \text{ Btu}}{\text{gal}} = 207,000 \text{ Btu/hour}$$

1 COAL ENGINE = 2,215,650 Btu/hour

\+ 2 DIESEL ENGINES = 414,000 Btu/hour

TOTAL HEAT INPUT AVAILABLE = 2,629,650 Btu/hour

B. AIR POLLANTANT EMISSION RATES (TABLE 1)

1) MONSON #3 COAL-FIRED ENGINE

a) SULFUR DIOXIDE, (SO_2), BASED ON 0.5% SULFUR CONTENT

$$\frac{150 \text{ lb coal}}{\text{hr}} * \frac{8 \text{ hr}}{\text{day}} * \frac{0.005 \text{ lbs S}}{\text{lb coal}} * \frac{2 \text{ lbs } SO_2}{1 \text{ lb S}} = \frac{12 \text{ lbs } SO_2}{\text{DAY}}$$

MOLECULAR wt of SO_2 = 64 g/MOLE

MOLECULAR WT of S = 32 g/MOLE

THEREFORE A 2:1 WT. TO WT. RATIO EXISTS.

b) NITROGEN DIOXIDE, (NO_2) BASED ON EMISSION RATE OF 3 lbs NO_2 / TON COAL BURNED

$$\frac{150 \text{ lbs coal}}{\text{hr}} * \frac{8 \text{ hrs}}{\text{DAY}} * \frac{3 \text{ lbs } NO_2}{2000 \text{ lbs coal}} = \frac{1.80 \text{ lbs } NO_2}{\text{DAY}}$$

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
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APPENDIX I (CONT.)

B.1.c) TOTAL SUSPENDED PARTICULATES BASED ON EMISSION RATE OF 15 lbs/TON COAL BURNED

$$\frac{150 \text{ lbs coal}}{\text{hr}} * \frac{8 \text{ hrs}}{\text{DAY}} * \frac{15 \text{ lbs Particulates}}{2000 \text{ lbs coal}} = \frac{9 \text{ lbs PARTICULATES}}{\text{DAY}}$$

2. 100 Hp DIESEL ENGINE

a) Sulfur Dioxide BASED ON 0.29 lbs SO_2 / MILLION Btu

$$\frac{1.5 \text{ gal}}{\text{hr}} * \frac{8 \text{ hr}}{\text{Day}} * \frac{138,000 \text{ Btu}}{\text{gal}} * \frac{0.29 \text{ lbs } SO_2}{1,000,000 \text{ Btu}} = \frac{0.48 \text{ lbs } SO_2}{\text{DAY}}$$

b) NITROGEN DIOXIDE BASED ON 4.41 lbs NO_2/MILLION Btu

$$\frac{1.5 \text{ gal}}{\text{hr}} * \frac{8 \text{ hr}}{\text{DAY}} * \frac{138,000 \text{ Btu}}{\text{gal}} * \frac{4.41 \text{ lbs } NO_2}{1,000,000 \text{ Btu}} = \frac{7.3 \text{ lbs } NO_2}{\text{DAY}}$$

c) TOTAL SUSPENDED PARTICULATES BASED ON 0.31 lbs/MILLION Btu

$$\frac{1.5 \text{ gal}}{\text{hr}} * \frac{8 \text{ hr}}{\text{Day}} * \frac{138,000 \text{ Btu}}{\text{gal}} * \frac{0.31 \text{ lbs Particulates}}{1,000,000 \text{ Btu}} = \frac{0.51 \text{ lbs Particulates}}{\text{DAY}}$$

C. AIR POLLUTANT EMISSION RATES (TABLE 2)

1) MONSON #3 COAL-FIRED ENGINE

a) ANNUAL SO_2 EMISSIONS

$$\frac{12 \text{ lbs}}{\text{DAY}} * \frac{100 \text{ days}}{\text{yr}} * \frac{1 \text{ TON}}{2000 \text{ lbs}} = 0.6 \text{ TONS/year}$$

$$\frac{12 \text{ lbs}}{\text{Day}} * \frac{300 \text{ days}}{\text{yr}} * \frac{1 \text{ TON}}{2000 \text{ lbs}} = \frac{1.8 \text{ TONS}}{\text{year}}$$

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
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APPENDIX I (cont.)

C.1.b. ANNUAL NO_2 EMISSIONS

$$\frac{1.8\ lbs\ NO_2}{DAY} * \frac{100\ days}{year} * \frac{1\ TON}{2000\ lbs} = \frac{0.09\ TONS\ NO_2}{year}$$

$$\frac{1.8\ lbs\ NO_2}{DAY} * \frac{300\ days}{year} * \frac{1\ TON}{2000\ lbs} = \frac{0.27\ TONS\ NO_2}{year}$$

c) ANNUAL TOTAL SUSPENDED PARTICULATE EMISSIONS

$$\frac{9\ lbs\ Particulate}{Day} * \frac{100\ days}{yr} * \frac{1\ TON}{2000\ lbs} = \frac{0.45\ TONS\ Particulate}{year}$$

2. 100 HP DIESEL ENGINE

a) ANNUAL SO_2 EMISSIONS

$$\frac{0.48\ lbs\ SO_2}{DAY} * \frac{200\ days}{year} * \frac{1\ TON}{2000\ lbs} = \frac{0.05\ TONS\ SO_2}{year}$$

$$\frac{0.48\ lbs\ SO_2}{DAY} * \frac{300\ days}{year} * \frac{1\ TON}{2000\ lbs} = \frac{0.072\ TONS\ SO_2}{year}$$

b) ANNUAL NO_2 EMISSIONS

$$\frac{7.3\ lbs\ NO_2}{DAY} * \frac{200\ days}{year} * \frac{1\ TON}{2000\ lbs} = \frac{0.73\ TONS\ NO_2}{year}$$

$$\frac{7.3\ lbs\ NO_2}{DAY} * \frac{300\ days}{year} * \frac{1\ TON}{2000\ lbs} = \frac{1.10\ TONS\ NO_2}{year}$$

c) ANNUAL TOTAL SUSPEND PARTICULATIES

$$\frac{0.51\ lbs\ Particulate}{DAY} * \frac{200\ DAYS}{year} * \frac{1\ TON}{2000\ lbs} = \frac{0.05\ TONS\ Part.}{year}$$

$$\frac{0.51\ lbs\ Particulates}{DAY} * \frac{300\ days}{year} * \frac{1\ TON}{2000\ lbs} = \frac{0.077\ Tons\ Part}{year}$$

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
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22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

APPENDIX II (CONT.)

A.2) 100 Hp DIESEL ENGINE

a) SO_2 ($\mu g/m^3$)

$$\text{LOADING RATE} = \frac{0.06\,lbs}{Hr} * \frac{1\,hr}{3600\,sec} * \frac{1\,Kg}{2.205\,lbs} * \frac{1000\,g}{1\,Kg} * \frac{1000\,mg}{g} = \frac{7.56\,mg}{sec}$$

AIR FLOW RATE = $164,448\ m^3/sec$

$$\text{CONC} = \frac{7.56\,mg/sec}{164,448\,m^3/sec} = 0.00005\,mg/m^3 = 0.046\,\mu g/m^3$$

b) NO_2 ($\mu g/m^3$)

$$\text{LOADING RATE} = \frac{0.91\,lbs}{hr} * \frac{1\,hr}{3600\,sec} * \frac{1\,Kg}{2.205\,lbs} * \frac{1000\,g}{1\,Kg} * \frac{1000\,mg}{1\,g} = \frac{115\,mg}{sec}$$

AIR FLOW RATE = $164,448\ m^3/sec$

$$\text{CONC.} = \frac{115\,mg/sec}{164,448\,m^3/sec} = 0.0007\,mg/m^3 = 0.7\,\mu g/m^3$$

c) TOTAL SUSPENDED PARTICULATES ($\mu g/m^3$)

$$\text{LOADING RATE} = \frac{0.064\,lbs}{hr} * \frac{1\,hr}{3600\,sec} * \frac{1\,Kg}{2.205\,lbs} * \frac{1000\,g}{1\,Kg} * \frac{1000\,mg}{1\,g} = \frac{8.06\,mg}{sec}$$

AIR FLOW RATE = $164,448\ m^3/sec$

$$\text{CONC.} = \frac{8.06\,mg/sec}{164,448\,m^3/sec} = 0.00005\,mg/m^3 = 0.05\,\mu g/m^3$$

B. AIR QUALITY MODEL # 2

MODEL WIDTH = 1.5 MILES = 2,414 m.

MODEL HEIGHT = 10 Feet = 3.048 m

WIND SPEED = 5 miles/hr = 2.235 M/sec

AIR FLOW RATE = $2,414m * 3.048m * 2.235\,m/sec = 16,445\,m^3/sec$

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APPENDIX II (CONT.) (AIR MODEL 2)

B-1 MONSON #3 COAL-FIRED ENGINE

a) SO_2 ($\mu g/m^3$)

LOADING RATE - SAME AS MODEL 1 = 189 mg/sec

AIR FLOW RATE = 16,445 m^3/sec

$$\text{CONC.} = \frac{189 \text{ mg/sec}}{16{,}445 \text{ m}^3/\text{sec}} = 0.0115 \frac{\text{mg}}{\text{m}^3} = 11.5 \frac{\mu\text{g}}{\text{m}^3}$$

b) NO_2 ($\mu g/m^3$)

LOADING RATE = SAME AS MODEL 1 = 22.34 mg/sec

AIR FLOW RATE = 16,445 m^3/sec

$$\text{CONC.} = \frac{22.34 \text{ mg/sec}}{16{,}445 \text{ m}^3/\text{sec}} = 0.001 \text{ mg/m}^3 = 1.7 \mu\text{g/m}^3$$

c) TOTAL SUSPENDED PARTICULATES ($\mu g/m^3$)

LOADING RATE = SAME AS MODEL #1 = 141.7 mg/sec

AIR FLOW RATE = 16,445 m^3/sec

$$\text{CONC} = \frac{141.7 \text{ mg/sec}}{16{,}445 \text{ m}^3/\text{sec}} = 0.0086 \text{ mg/m}^3 = 8.6 \mu\text{g/m}^3$$

2) 100 Hp DIESEL ENGINE

a) SO_2 ($\mu g/m^3$)

LOADING RATE = SAME AS MODEL #1 = 7.56 mg/sec

AIR FLOW RATE = 16,445 m^3/sec

$$\text{CONC} = \frac{7.56 \text{ mg/sec}}{16{,}445 \text{ m}^3/\text{sec}} = 0.00046 \frac{\text{mg}}{\text{m}^3} = 0.46 \frac{\mu\text{g}}{\text{m}^3}$$

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
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APPENDIX II

A. AIR QUALITY MODEL #1

MODEL WIDTH ... 1.5 MILES ... $\frac{1.5 \text{ miles}}{1} * \frac{1609.3 \text{ meter}}{1 \text{ mile}} = 2,414 \text{ m.}$

MODEL HEIGHT 100 Ft $\frac{100 \text{ Ft}}{1} * \frac{0.3048 \text{ meter}}{1 \text{ foot}} = 30.48 \text{ M.}$

WIND SPEED 5 miles/hour $\frac{5 \text{ miles}}{\text{hour}} * \frac{1 \text{ hr}}{3600 \text{ sec}} * \frac{1609.3 \text{ M}}{1 \text{ mile}} = 2.235 \frac{\text{M}}{\text{sec}}$

1) MONSON #3 COAL FIRED ENGINE

a) SO_2 (mg/m^3)

$$\text{Loading RATE} = \frac{1.5 \text{ lbs } SO_2}{\text{Hr}} * \frac{1 \text{ hr}}{3600 \text{ sec}} * \frac{1 \text{ kg}}{2.205 \text{ lbs}} * \frac{1000 \text{ g}}{1 \text{ kg}} * \frac{1000 \text{ mg}}{1 \text{ g}} = \frac{189 \text{ mg}}{\text{sec}}$$

$$\text{AIR FLOW RATE} = \text{Area} * \text{Velocity} = 2,414 \text{ m} * 30.48 \text{ m} * \frac{2.235 \text{ m}}{\text{sec}} = \frac{164,448 \text{ m}^3}{\text{sec}}$$

$$\text{CONC} = \frac{\text{Loading Rate}}{\text{AIR FLOW RATE}} = \frac{\frac{189 \text{ mg}}{\text{sec}}}{\frac{164,448 \text{ m}^3}{\text{sec}}} = \frac{0.00115 \text{ mg}}{\text{m}^3} = \frac{1.15 \text{ mg}}{\text{m}^3}$$

b) NO_2 (mg/m^3)

$$\text{Loading RATE} = \frac{0.225 \text{ lbs}}{\text{hr}} * \frac{1 \text{ hr}}{3600 \text{ sec}} * \frac{1 \text{ kg}}{2.205 \text{ lbs}} * \frac{1000 \text{ g}}{1 \text{ Kg}} * \frac{1000 \text{ mg}}{1 \text{ g}} = \frac{28.34 \text{ mg}}{\text{sec}}$$

AIR FLOW RATE = 164,448 m^3/sec

$$\text{CONC} = \frac{\text{LOADING RATE}}{\text{AIR FLOW RATE}} = \frac{28.34 \text{ mg/s}}{164,448 \text{ m}^3/\text{s}} = 0.00017 \frac{\text{mg}}{\text{m}^3} = 0.17 \frac{\mu\text{g}}{\text{m}^3}$$

c) TOTAL SUSPENDED PARTICULATES (mg/m^3)

$$\text{LOADING RATE} = \frac{1.125 \text{ lbs}}{\text{Hr}} * \frac{1 \text{ hr}}{3600 \text{ sec}} * \frac{1 \text{ kg}}{2.205 \text{ lbs}} * \frac{1000 \text{ g}}{1 \text{ Kg}} * \frac{1000 \text{ mg}}{1 \text{ g}} = \frac{141.7 \text{ mg}}{\text{m}^3}$$

AIR FLOW RATE = 164,448 m^3/sec

$$\text{CONC.} = \frac{141.7 \text{ mg/sec}}{164,448 \text{ m}^3/\text{sec}} = 0.00086 \frac{\text{mg}}{\text{m}^3} = 0.86 \frac{\mu\text{g}}{\text{m}^3}$$

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
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APPENDIX II (cont.)

B.2.6) NO_2 ($\mu g/m^3$)

LOADING RATE = SAME AS AIR MODEL #1 = 115 mg/sec

AIR FLOW RATE = 16,445 m^3/sec

$$\text{CONC} = \frac{115\ mg/sec}{16{,}445\ m^3/sec} = 0.007\ mg/m^3 = 7.0\ \mu g/m^3$$

c) Total Suspended Particulates ($\mu g/m^3$)

LOADING RATE = SAME AS AIR MODEL #1 = 8.06 mg/sec

AIR FLOW RATE = 16,445 m^3/sec

$$\text{CONC} = \frac{8.06\ mg/sec}{16{,}445\ m^3/sec} = 0.0005\ mg/m^3 = 0.50\ \mu g/m^3$$

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
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THE MAINE NARROW GAUGE RAILROAD COMPANY & MUSEUM

Portland, Maine

COMBUSTION EMISSION COMPARISONS

Monson #3 Coal Burning Locomotive

ASSUMPTIONS:

1.) Monson #3 burns a good quality metallurgical coal (semi-bituminous) that is considered premium steam coal. The coal is purchased under a tight, carefully monitored contract specification and the enginemen are highly trained and motivated concerning the proper combustion of this coal in the locomotive firebox.

2.) Historically, 2ft. gauge steam locomotives like the Monson #3 burn approximately 40 lbs of coal per mile during typical operations. The Maine Narrow Gauge Railroad Co. line is 1 1/2 miles long. This means each round trip is 3 miles long and about 10 trips per day can be made. Calculation of the total coal consumed per day follows:

$$40 \cdot 3 \cdot 10 = 1200 \quad \text{lbs of coal per day}$$

The total coal consumed per hour (on average) is calculated based on an 8 hour day:

$$\frac{1200}{8} = 150 \quad \text{lbs of coal per hour}$$

3.) All combustion emission comparisons are based on the quantity of ambient air used for the combustion process being compared. All air quantities are converted to standard conditions (atmospheric pressure @ 68 degrees f.) for a standard unit of comparison. The Monson #3 is conservatively estimated to consume 100% excess air above the air required for combustion. The air required for combustion is taken from STEAM POWER PLANT ENGINEERING by Gebhardt, page 78. This quantity is 7.5 lbs of dry air per 10,000 btu of solid fuel heating value. The approximate heating value of the locomotive coal is 14,771 btu per lb.

LOCOMOTIVE COMBUSTION AIR CONSUMPTION CALCULATION:

The combustion air required for operation of the Monson #3 for one day (8 hrs.) is calculated from the following equation:

c = 1200 lbs of coal per day

h = 14771 btu per lb of coal

a = 7.5 lbs of dry air per 10,000 btu of fuel heating value

q = 0.0752 air density, lbs per cubic foot

x = 1.5 excess air factor for 50% excess air

$$\frac{\frac{c \cdot h}{10000} \cdot 7.5}{0.0752} \cdot x = 265170.878$$ cubic feet of ambient air required for combustion in Monson #3 locomotive

Information for the above calculations obtained from The PetitJean Co., Inc. Fall City. Washington

COMBUSTION EMISSION COMPARISONS

Gasoline Powered Automobiles

ASSUMPTIONS

1.) Assume one automobile running around Portland all day (8 hrs) at 25 miles per hour while obtaining a fuel mileage of 25 miles per gallon.

2.) The total gasoline consumption for one day (8 hrs) follows:

$$\frac{25 \cdot 8}{25} = 8$$ gallons per day @ 200 miles per day

3.) 15 lbs of air are required for every lb of gasoline burned -- one gallon of gasoline weighs 7.1 lbs. Therefore the air required to burn one gallon of gasoline follows:

$7.1 \cdot 15 = 106.5$ lbs of air required to burn one gallon of gasoline

4.) The gasoline engine runs at 5% excess air

AUTOMOBILE COMBUSTION AIR CONSUMPTION CALCULATION:

The combustion air required for operation of an average automobile for one day (8 hrs) in the greater Portland area is calculated from the following equation:

$d = 106.5$ lbs of air required to burn one gallon of gasoline

$e = 8$ gallons per day fuel consumption

$y = 1.05$ excess air factor for 5% excess air

$$\frac{d \cdot e \cdot y}{q} = 11896.277$$ cubic feet of ambient air required for combustion in an average automobile

COMPARISON OF AVERAGE AUTOMOBILE WITH MONSON #3 LOCOMOTIVE

$$\frac{\frac{\frac{c \cdot h}{10000} \cdot 7.5}{0.0752} \cdot x}{\frac{d \cdot e \cdot y}{q}} = 22.29$$ Average automobiles = Monson #3

The information for the above calculations was obtained from the Petitjean Co., Inc. of Fall City, Washington and Veridyne, Inc. of Topsfield, Massachusetts.

COMBUSTION EMISSION COMPARISON

Diesel Powered Semi-Truck

ASSUMPTIONS:

1.) Assume one Semi-Truck running around Portland all day (8 hrs) at 20 miles per hour while obtaining a fuel mileage of 4 miles per gallon.

2.) The total diesel fuel consumption for one day (8 hrs) follows:

$$\frac{20 \cdot 8}{4} = 40$$ gallons per day @ 160 miles per day

3.) 7.5 lbs of air are required per 10,000 btu of diesel fuel heating value. The heating value of diesel oil (#2 fuel oil) is 138,000 btu per gallon.

4.) The diesel engine runs at 25% excess air

DIESEL TRUCK COMBUSTION AIR CONSUMPTION CALCULATION:

The combustion air required for operation of an average Semi-Truck for one day (8 hrs) in the greater Portland area is calculated from the following equation:

f = 40 gallons of diesel fuel per day

g = 138000 btu per gallon of diesel fuel

z = 1.25 excess air factor for 25% excess air

a = 7.5 lbs of air per 10,000 btu of diesel fuel heating value

q = 0.0752 air density, lbs per cubic foot

$$\frac{\frac{f \cdot g}{10000} \cdot a \cdot 1.25}{q} = 68816.489$$ cubic feet of ambient air required for combustion is an average Semi-Truck

COMPARISON OF AVERAGE SEMI-TRUCK WITH MONSON #3 LOCOMOTIVE

$$\frac{\frac{\frac{c \cdot h}{10000} \cdot 7.5}{0.0752} \cdot x}{\frac{\frac{f \cdot g}{10000} \cdot a \cdot 1.25}{q}} = 3.853$$ Average Semi-Trucks = Monson #3

COMBUSTION EMISSION COMPARISONS

Commercial Jet Airplane

ASSUMPTIONS.

1.) Assume one Boeing 737-300 with G.E. CF-6 engines making one takeoff from Portland International Airport

2.) 9,000 lbs of jet fuel A are required for the first hour of flight -- 5,000 lbs of fuel are required for cruising at altitude (30,000 - 37,000 feet). It take approximately 17 minutes from takeoff until cruising altitude is reached. The quantity of fuel burned during takeoff and climb is assumed to be the only emission relevent to the greater Portland area. This quantity of fuel is calculated as follows:

$$9000 - 5000 \cdot \frac{17}{60} = 7583.333$$ lbs fuel consumed during takeoff and climb

3.) 15 lbs of air are required for every lbs of fuel burned.

4.) The jet engines run at 5% excess combustion air (excess dilution air for cooling burner cans is not included for emission purposes)

JET AIRPLANE COMBUSTION AIR CONSUMPTION CALCULATION:

The combustion air required for one 737-300 taking off from Portland International Airport is calculated from the following equation:

i = 7583 lbs fuel consumed during takeoff and climb

j = 15 lbs of air required to burn one lb of fuel

y = 1.05 excess air factor for 5% excess air

q = 0.0752 air density, lbs per cubic foot

$$\frac{i \cdot j \cdot y}{q} = 1588194.814$$

cubic feet of ambient air required for combustion during takeoff and climb of a 737-300 commercial airplane

COMPARISON OF 737-300 AIRPLANE WITH MONSON #3 LOCOMOTIVE

$$\frac{\frac{i \cdot j \, y}{q}}{\frac{\frac{c \cdot h}{10000} \cdot 7.5}{0.0752} \cdot x} = 5.989$$

Monson #3 locomotives = one 737-300 takeoff and climb

COMBUSTION EMISSION COMPARISONS
Residential Wood Heating Stove

ASSUMPTIONS:

1.) Assume the average wood stove necessary to heat a 2,000 sq. ft. home is rated at 50,000 btu per hour.

2.) Assume that the wood stove is running at 80% efficiency and 50% capacity for one day (8 hrs). This means the stove is consuming wood fuel at the rate of 25,000 btu per hour and the total wood fuel consumption for the day follows:

$$\frac{25000 \cdot 8}{.8} = 250000$$ btu of wood fuel per day (8 hrs)

3.) The wood stove is running at 50% excess air

WOOD STOVE COMBUSTION AIR CALCULATION:

k = 250000 btu of wood fuel per day (8hrs)

u = 1.5 excess air factor for 50% excess air.

a = 7.5 lbs of dry air per 10,000 btu of fuel heating value

q = 0.0752 air density, lbs per cubic foot

$$\frac{\frac{k}{10000}\cdot a\cdot u}{q} = 3740.027$$

cubic feet of ambient air required for combustion in an average residential wood heating stove

COMPARISON OF AVERAGE WOOD STOVE WITH MONSON #3 LOCOMOTIVE

$$\frac{\frac{\frac{c\cdot h}{10000}\cdot 7.5}{0.0752}\cdot x}{\frac{\frac{k}{10000}\cdot a\cdot u}{q}} = 70.901$$

Average wood stoves = Monson #3

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MAINE
NARROW
GAUGE
RAILROAD Co.
&
MUSEUM

58 FORE STREET • PORTLAND, MAINE 04101 • (207) 828-0814

May 13, 1994

Mrs. Jadine O'Brien
Chairperson, Planning Board
City of Portland
389 Congress Street
Portland, Maine 04101

Dear Mrs. O'Brien:

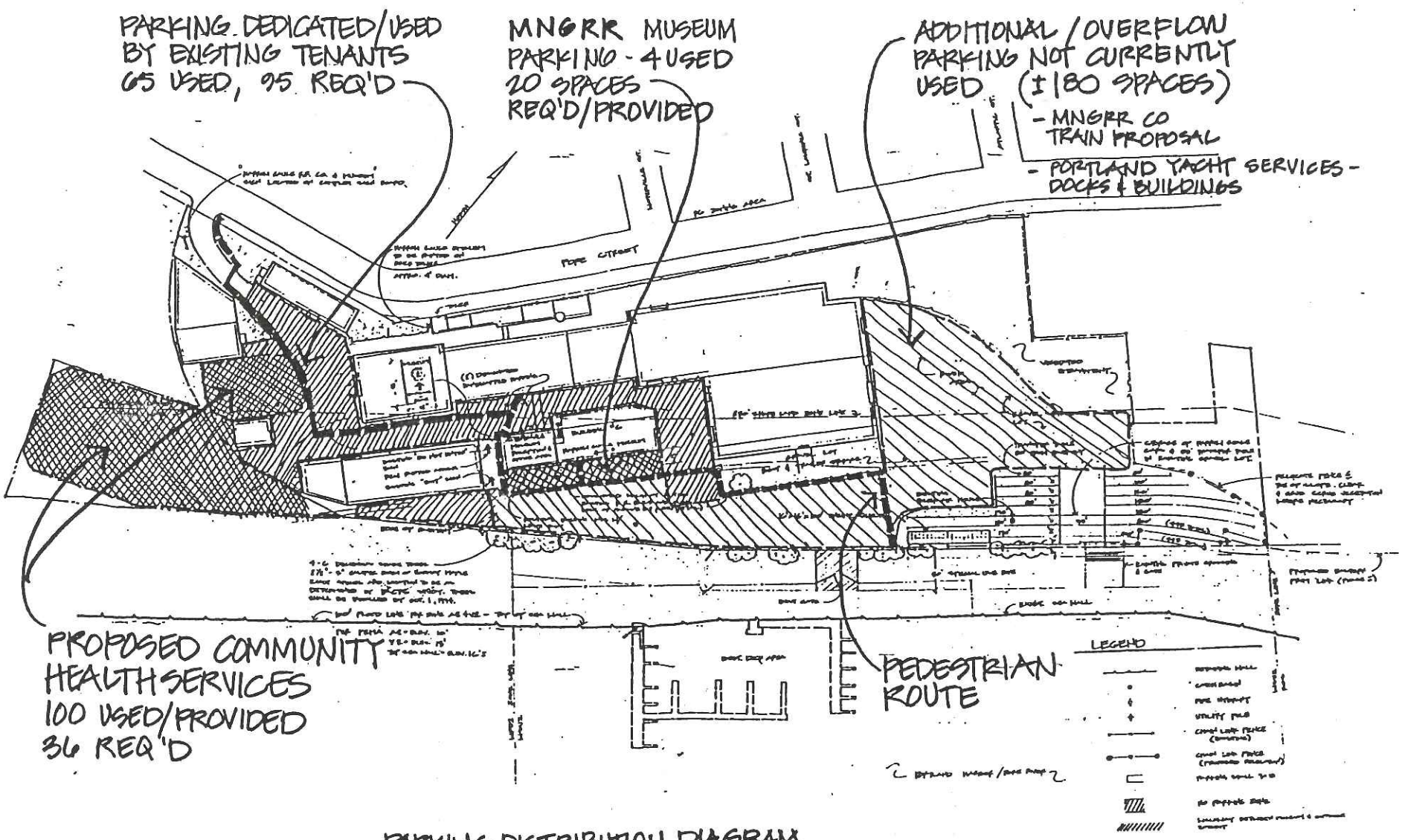
Having heard that the planning board is in the process of evaluating the site plan of the Maine Narrow Gauge Railroad and the Portland Trails recreational path, I wish to describe to you our understanding of the health and air quality impact of the train on the trails. First, the pertinent emissions from the railroad operation will include sulfur dioxide, unburned hydrocarbons and particulates. We will be burning a metallurgical grade of coal which is low in sulfur (0.5%) and particulates. The sulfur dioxide emissions will be within regulatory restrictions applied to coal and diesel fuel combustion (i.e. less than 2%). The issue of unburned hydrocarbons and petroleum polymers is generally confined to diesel engines of which we have two. We expect each of these engines to have the impact of a single diesel truck because the diesel locomotives in fact have truck engines for power. Interestingly, from a health perspective the greatest issue from our coal burning locomotives is particulates, namely exhaust particles containing "fly ash". I have discussed the health effects of fossil fuel and coal burning with George E. Bokinsky, M.D. of the Pulmonary Department at Maine Medical Center. In particular, I have discussed coal burning and resultant production of fly ash with Dr. Bokinsky. Some ash does escape with the stack smoke but this can be held to a minimum by visual monitoring of the engine operation. In addition, prevailing winds will cause rapid dissipation of the remaining particulates in the area of concern. An additional issue is associated with the ashes which are collected beneath the engine fire box. If these are not properly handled (such as ash dropping onto the track/roadbed), they can create an airborne particulate problem of significance, similar to dust coming from a dirt road. Our ash will be disposed of in sealed containers and not allowed to escape, and the rate of travel of the train will be slow, about 10-15 mph. Thus, the way we intend to control these air quality and health concerns is to: (a) burn a low-sulfur, low-ash coal (metallurgical grade source already secured), (b) employ a well-trained and highly motivated engineer staff who will maintain an efficiently burning and therefore clean burning energy source (visable smoke means inefficient operation of engine and subsequent emission of particulates), and (c) maintain high quality practices regarding the proper handling and disposal of ash produced by the engines. Finally, I would note that our engines are very small and our frequency of operation will be limited. We expect that these factors

combined with the above described efforts to avoid unwanted emissions will answer any concerns regarding air quality and potential health problems associated with our operations. We will continue to work with Dr. Bokinsky on these matters as appropriate. As an organization, we remain committed to acting as responsible neighbors in the Eastern Promenade area.

Yours sincerely,

Gilbert M. Wilcox, M.D.
Trustee Maine Narrow Gauge Railroad
Museum

GMW;dlg



PARKING DISTRIBUTION DIAGRAM

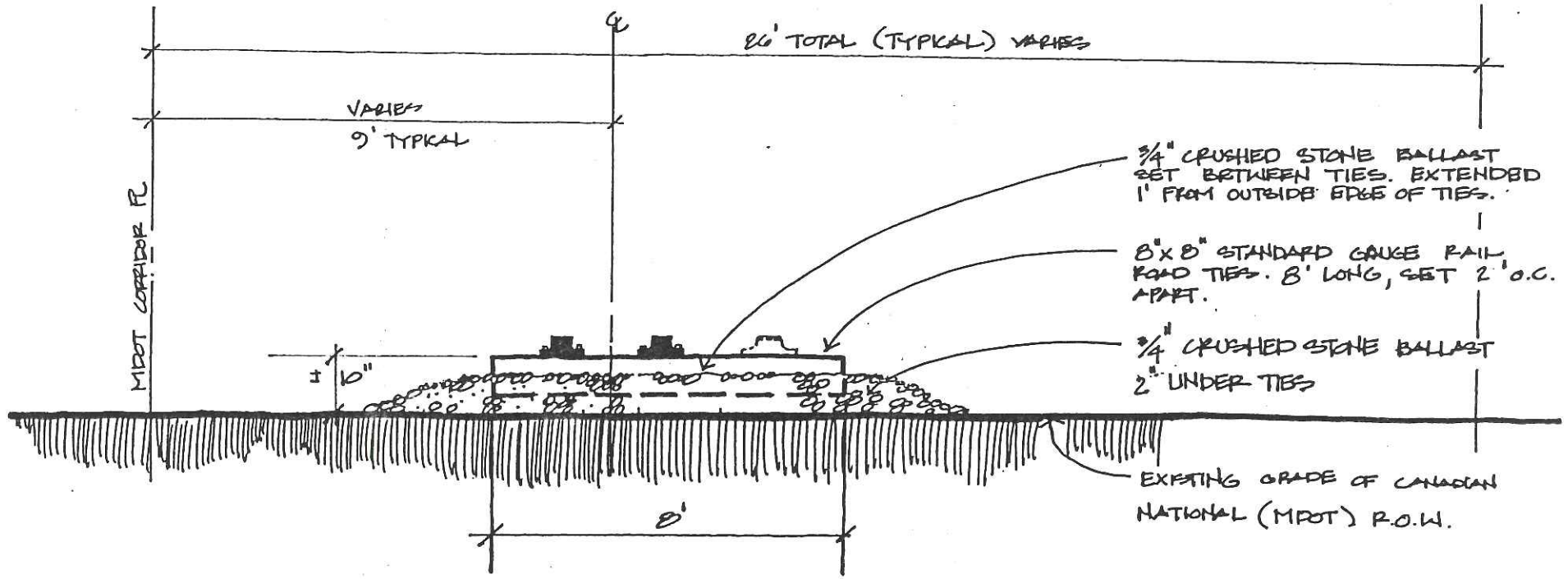
58 FORE STREET
PORTLAND, ME.

mahr & seredin, landscape architects

scale: 1" = 50' (N.T.S.)

date: 9 • 93
6/6/04

C-5



TYPICAL TRACK CROSS SECTION

1" = 2'

B-65

B-666

STATE OF MAINE

DEPARTMENT OF TRANSPORTATION

Permit to Enter onto State-owned Railroad Property

(Individual)

WHEREAS, J. E. Lancaster and others as Employees/Volunteers of Maine Narrow Gauge Railroad Company & Museum, 58 Fore Street, Portland, Maine 04101 (hereinafter "Permittee") has requested the permission of STATE OF MAINE DEPARTMENT OF TRANSPORTATION (hereinafter "MDOT") to enter and be upon or about the right of way, or other premises, of its Railroad at Portland, Maine for his own purposes and benefit, and particularly for the purpose of constructing temporary trackage, including turnouts, connecting to Portland Company property on MDOT Right of Way between India Street and a point approximately 500' North of the Portland House/Fort Allen Park property line. This location is in conformance with letter from Portland Trails dated August 25, 1993. Final location of track to be determined as part of negotiations with Portland Trails, etc. for use by the Maine Narrow Gauge Railroad Company & Museum at Portland, Maine.

NOW, THEREFORE, MDOT hereby grants permission, for a period of 185 days commencing November 29, 1993 subject to cancellation at any time and in no event be assignable or transferable, to Maine Narrow Gauge Railroad Company and Museum to enter or be upon or about its right of way or other premises, at the location described above solely for the purpose specified above and no other purposes: provided, however, that this permission shall be of no force and effect unless and until said Permittee duly signs and executes the GENERAL RELEASE AND INDEMNITY which is hereinafter set forth.

STATE OF MAINE DEPARTMENT
OF TRANSPORTATION

By: Allan H. Bartlett 1/7/94
Allan H. Bartlett, Acting Director
Rail Transportation Division

GENERAL RELEASE AND INDEMNITY

In consideration of MDOT granting to the undersigned the permission above described, the undersigned, understanding the risk and danger assumed by him and attendant upon his exercise of said permission and that MDOT is under no duty or obligation to give such permission, hereby assumes all risk of injury to the Permittee (including death) and of loss of or damage to his property

occurring or arising while or resulting from being upon or about the said right of way, or other premises, of the said MDOT, whether due in whole or in part to the condition of operation, negligent or otherwise, of said right of way, or other premises, or in whole or in part to the acts or omissions, negligent or otherwise, of the officers, agents, servants, or employees of said MDOT or otherwise: and the undersigned for himself, his executor, administrator, heirs at law, next of kin and his successors and assigns hereby releases and forever discharges said MDOT, its successors and assigns from any and all claims, demands, actions and causes of action which the undersigned, his executor, administrator, heirs at law, next of kin and his successors and assigns have, could or might have against the said MDOT, its successors and assigns, for injury to his person (including death) and loss of or damage to his property occurring or arising while, or resulting from, being upon or about said right of way or other premises of the said MDOT, whether due in whole or in part to the condition or operation, negligent or otherwise, of said right of way, or in whole or in part to the acts or omissions, negligent or otherwise, of the officers, agents, servants, or employees of the said MDOT or otherwise. Further, the Permittee agrees to indemnify and hold harmless MDOT, its successors and assigns, from any and all loss, cost, claims, demands, damages, actions and causes of action, including attorney's fees, which the undersigned, his executor, administrator, heirs at law, next of kin and his successors and assigns, have, could or might have against the said MDOT, its officers, agents, servants, or employees, as well as its successors and assigns, for injury (including death) and loss of or damage to Permittee's property occurring or arising while or resulting from, being upon or about said right of way, or other premises, of said MDOT, whether due in whole or in part to the condition or operations, negligent or otherwise, of said right of way, or other premises or in whole or in part to the acts or omissions, negligent or otherwise, of MDOT, its officers, agents, servants, or employees, or otherwise.

I HAVE READ THE ABOVE RELEASE AND INDEMNIFICATION AGREEMENT CAREFULLY AND I UNDERSTAND THAT I AM ASSUMING ALL RISKS OF EVERY KIND AS SET FORTH IN SAID RELEASE IN EXERCISING THE PERMISSION GRANTED ABOVE.

Dated: November 29, 1993

PERMITTEE

K K Bartlett

WITNESS

NAME

B-68

August 25, 1993

Phineas Sprague, Jr.
Maine Narrow Gauge Railroad
58 Fore Street
Portland ME 04101

Re: Eastern Promenade Rail-Trail Corridor - Maine Narrow Gauge Railroad Location

Dear Phineas:

This letter is in response to your request for Portland Trails' comments on your proposed location of the Maine Narrow Gauge Railroad track along the base of the Eastern Promenade on the land which the Maine Department of Transportation (MDOT) will soon be acquiring via The Trust for Public Land from Canadian National Railway Company. As you know, Portland Trails along with The Trust for Public Land, the City of Portland and the Maine Department of Transportation have been working on this acquisition for over two years. We expect to close on the acquisition on August 30.

I think virtually everyone agrees that the acquisition of almost two miles of waterfront land in the City of Portland for public use represents a unique transportation and recreational opportunity for the City and for the State.

We assume that general questions regarding the Maine Narrow Gauge Railroad (e.g., general location, hours of operation, safety measures, etc.) are ones which will be discussed in the context of a public forum before the City of Portland Planning Board and the City Council with input from the citizens of Portland and neighborhood groups, including the Munjoy Hill Neighborhood Organization. Portland Trails' general position on rail and trail use of the Eastern Promenade Corridor is as follows:

1. Planning and improvement of the Eastern Promenade Corridor should be done once, done well, and done in a way which will fully utilize this magnificent opportunity. In this vein we think that several cross section drawings showing proposed

locations of the rail line and adjacent trails at several points along the Corridor would be very useful.

2. The City of Portland will take the lead in organizing the plans for the Corridor, but will work with Portland Trails, MDOT, the Friends of the Parks, neighborhood groups, and other interested parties including the Maine Narrow Guage Railroad and the Maine Olmsted Alliance.

3. Appropriately located, a rail line is compatible with adjacent pedestrian and bicycle trails.

4. The rail line should be located as close to the inland edge of the land being conveyed to MDOT as is technically and legally possible so as to provide ample room for a pedestrian and a bicycle trail and other recreational use of the waterfront between the rail line and the water. The only possible exception would be that portion of the proposed rail line which would pass through the 26-foot wide corridor next to City land leased to BIW.

5. Barriers between the trail corridor and the rail line, if any, which may be required for reasons of public safety should be as unobtrusive as reasonably possible.

6. The rail line should not extend onto the old trestle and swivel bridge until such time as the swivel bridge is fully operational.

As a practical matter, what this means is that we believe that the rail line should be on the inland side of the trail Corridor from a point about 900 feet easterly from the end of Commercial Street all the way to the railroad trestle.

While Portland Trails' preference is that any installation of tracks follow more complete planning, we recognize that you are under some time constraints to get a portion of the railroad operating. Assuming you can reach agreement with MDOT and obtain appropriate approvals from the City of Portland, perhaps an initial section of track could extend south to Commercial Street and north toward Fish Point from the Portland Company property before final plans are set for the entire Corridor.

Finally, would you please keep us advised of your plans for the rail line location as they evolve.

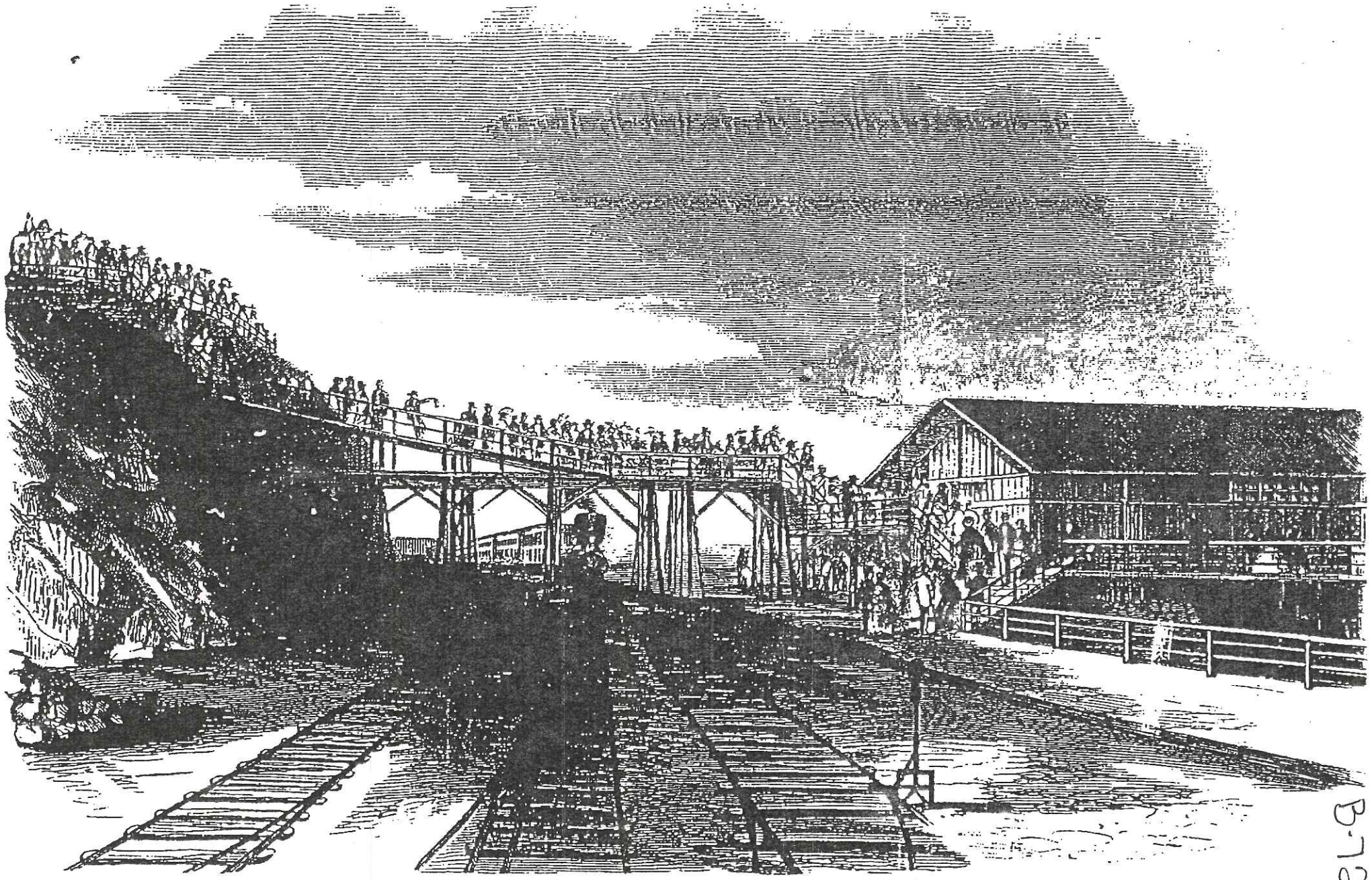
Very truly yours,

Nathan H. Smith
Vice President
Portland Trails

cc Peter Monro, President, Portland Trails
Joseph Gray, Director of Planning and Urban Development, City of Portland
Virginia Hildreth, Director of Economic Development, City of Portland
Allan Bartlett, Maine Department of Transportation
Ed Ashley, Maine Narrow Gauge Railroad ✓

B-71

SOILS INFORMATION
SOURCE: SCS MEDIUM INTENSITY SOILS SURVEY



THE VICTORIA DOCK, AT PORTLAND, ME, ORIGINALLY ERECTED FOR THE GREAT EASTERN STEAMSHIP, AS IT APPEARED A FEW HOURS BEFORE THE ARRIVAL OF THE PRINCE OF WALES.

Historic Crosswalk & Trackage Near Fish Point

NOTE: Not part of phase one.

B-73

Rails-With-Trails:
Sharing Corridors For Recreation and Transportation

By Michael Brilliot and
Julie A. Winterich

RAILS -TO- TRAILS CONSERVANCY

1400 16th Street, NW, #300
Washington, D.C. 20036
202-797-5400 (phone)
202-797-5411 (fax)

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RAILS-WITH-TRAILS
Sharing Corridors for Transportation and Recreation

Can trails safely function alongside active rail lines?

This is the question that the Rails-to-Trails Conservancy set to answer through a detailed survey of trail managers in charge of 16 existing corridors, in 11 states, which have parallel side-by-side rail lines and trails.

The result proved to be a resounding "Yes!" -- rails and trails <u>can</u> safely and satisfactorily co-exist. In fact, our research indicates that trails alongside active rail lines could prove to become a significant addition to our nation's transportation and recreation system in the 21st Century.

Before 1986, only a handful of what we will refer to as "rails-with-trails" were in existence. Today, because of the growth of the trails movement and the restructuring of the railroad industry, rails-with-trails projects are blossoming across the country. For instance:

* In the cities of San Diego, Calif., and Chapel Hill, N.C., trails alongside rails provide students and faculty with a vital link to their universities.

* In Zanesville, Ohio, a rail-with-trail has so successfully provided a safe environment for families to walk and bike, the city is working with Conrail to expand the trail an additional nineteen miles.

* In the Chicago Metropolitan area, the Illinois Prairie Path gives city residents the opportunity to experience some of the last remnants of the region's prairie ecosystem.

* In Washington state, the Grandview/Sunnyside Pathway connects the two rural towns of Grandview and Sunnyside with a non-motorized alternative to the congested adjacent highway.

The 16 rails-with-trails surveyed are as varied as trails built on abandoned rail corridors; some stretch through rural terrain while others connect urban and suburban areas.

RTC found a wide variance in the type of railroad adjacent to the trail, from mainlines with a continuous parade of 80 mile-per-hour "hot shot" freights to industrial spurs with 15 mile-per-hour weekly locals.

Fifteen of the 16 trails share one paramount fact: no trail user/train accident. The exception, the Illinois Prairie Path, had only one train-related accident in its 27-year history. This accident involved a bicyclist injured by a slow moving train when, ignoring bells and flashing lights, she rode around a lowered crossing gate. (Technically, the accident did not occur on the trail corridor, but at a street/railroad grade-crossing adjacent to the trail.) Trails adjacent to rails appear to be no more dangerous than trails alone or adjacent to city streets.

For the purpose of this analysis, the 16 trails are grouped into two broad categories: those adjacent to branch lines or industrial spurs, and those adjacent to mainlines or mass transit lines.

Typically, branch lines and industrial spurs have low operating speeds and infrequent service. The trails surveyed that fall under this category include the Grandview/Sunnyside Pathway, the Pedestrian Pathway, the Waterfront Trail and the Duwamish Trail, all in Washington; the Rock Island

Trail in Colorado; the Libba Cotton Bikepath in North Carolina; and The Elk River Trail in West Virginia.[1]

Adjacent to rails with 10 to 25 mile-per-hour trains running between three times daily to once monthly, these trails tend to run much closer to the tracks than those adjacent to mainlines. Most of the trails in this group are separated from the railroad tracks by a distance of less than 30 feet, with many as close as eight feet. Frequently, the trails have minimal barriers and those with barriers most commonly use vegetation and slight grade separation.

In contrast, mainline trains and mass transit lines typically travel at higher speeds and operate more frequently. The trails in this group include the Green Bay Trail and the Illinois Prairie Path, both in Illinois; the La Crosse River State Trail in Wisconsin; the Celina/Coldwater Bike Trail and the Zanesville Riverfront Pathway both in Ohio; the Heritage Trail in Iowa; the Rose Canyon Bike Path in California; the Southwest Corridor Park Trail in Massachusetts; and the Traction Line in New Jersey.

The majority of these trails are separated from the railroad tracks by 50 to 100 feet and by some type of barrier, most commonly grade separation, vegetation (including trees), ditches or some kind of fencing. However, proximity to a highly active, high-speed rail line does not necessarily require greater separation between the tracks and trail. RTC's findings include a few successful examples of trails residing close to mainlines. Developed within 20 feet from commuter rail tracks, the Traction Line installed a chain link fence to accomodate this close proximity. The Southwest Corridor Park Trail in Boston, separated from a mainline by a distance varying in length from 20 to 50 feet, installed a cement wall and a chain link fence along the entire trail. Two other trails, the Illinois Prairie Path and the Zanesville Bikeway, are separated by fences in the few areas where they are within 15 to 25 feet of the tracks.

A majority of the rails-with-trails managers indicated peak hours of rail service do not correspond with peak hours of trail use. In the case of the Celina/Coldwater Trail, most of the trains run at night. For trails next to commuter and mass transit lines, such as the Illinois Prairie Path, the Southwest Corridor Park Trail and the Green Bay Trail, peak rail service occurs during the week while peak trail use occurs on weekends.

Of all the managers surveyed, only three reported minor problems with railroad maintenance practices infringing upon the trail. The Southwest Corridor Park Trail, the Illinois Prairie Path and the La Crosse River State Trail all reported that railroad vehicles occasionally use the trail surface to access the active railroad grade.

The manager of the Southwest Corridor Park Trail also benefits from railroad maintenance practices because of an agreement requiring the transit agency to help remove litter along the trail easement, saving the park approximately $50,000 annually. This agreement will expire in 1995.

In addition, the managing agency of the Pedestrian Pathway found the adjacent railroad's maintenance procedures helpful. Semi-annually, Burlington Northern clears brush and sprays weed along the tracks and along the side of the corridor without the trail. Because of the need to prevent brush fires in the summer, the railroad saves the agency from sole responsibility of clearing the entire corridor.

With the exception of the Green Bay Trail, all the trails are insured and most are covered by a city, county or state self-insurance policy. Of all the insured trails, only the Libba Cotton Bikepath was required to release the corridor's owner (which happens to be the University of North Carolina) from all liability for accidents on the trail.

[1] Although the Waterfront Trail is adjacent to a historic trolley running at 30-minute intervals, it is included with the branch line/spur group because the trolley runs at speeds of 10-15 miles-per-hour.

Only the La Crosse River State Trail reported a train-related accident claim filed against the managing agency. The accident involved a farm animal breaking through the trail's fence onto the railroad tracks where it was hit and killed by a train. As a result of the claim, the state reimbursed the adjacent farmer for the cost of the animal.

Significantly, no trail manager reported any claims filed against the adjacent railroad by a trail user. Perhaps, because of this fact and the low incidence of accidents, managers also reported railroads were either indifferent to rails-with-trails, or in some cases, very favorable toward the arrangement.

With the exception of the Duwamish Trail, railroads were also not opposed to the development of an adjacent trail. For the Duwamish Trail, the railroad feared an adjacent trail would cause increased liability. However, because the city of Seattle owned the right-of-way, construction of the trail continued.

In another case, the Sante Fe Railway did not oppose the Rose Canyon Bike Path, but opposed and successfully stopped the construction of at-grade trail crossings; the railroad required trail crossings at above or below grade only.

Very few of the managers surveyed obtained land for their trail from the active adjacent railroad. In most cases, the trail corridor was either obtained from another railroad abandoning a line parallel to the active line, or was part of an existing state-owned right-of-way such as a highway right-of-way. Only the Zanesville Riverfront Bikepath and the Pedestrian Pathway obtained their trail right-of-way from the adjacent railroad. The city of Zanesville in Ohio both purchased and obtained a partial easement from Conrail, while the city of Issaquah in Washington built its trail by obtaining unofficial permission from Burlington Northern; BN intends to sell the entire corridor to the city in the future.

Also, a number of trail projects are underway in which planners intend to obtain easements from private freight railroads to construct their trail. For example, the planners for the Illinois Prairie Path are currently researching obtaining an easement from the Chicago & North Western to extend the trail in West Chicago; and the managing agency for the Philadelphia-Valley Forge Bikeway is working with Conrail to obtain an easement for a trail extension.

RTC receives an ever-increasing number of inquiries from trail planners and citizen activists on the feasibility of placing trails alongside active rail lines. Rails-with-trails is a growing trend in the 1990s, not only because of the growing rail-trail movement, but also because of the changing structure of the railroads. The continued contraction of private rail yards and multi-track lines, the acquisition of rail corridors by public transit agencies for mass transit, and the increasing number of historic and tourist railroads have presented many communities with a new transportation and recreation opportunity. And because of new bicycle and pedestrian funding sources, money is available to take advantage of this opportunity. Rails-with-trails may be the solution for providing communities auto-free pathways for transportation and recreation.

Methodology

RTC first consulted with trail planners currently working on new rails-with-trails projects to discuss what information would be helpful for their projects. Their comments were compiled with RTC's questions into a written survey which was sent to the trail managers of 20 existing rails-with-trails in 13 states. The specific list of questions asked appears at the end of this study under the section titled: "Rails-with-Trails Responses." RTC received responses from the managers of 16 trails. Almost all the surveys received were followed up with a telephone call for more detailed information.

Findings

Following are the results of the study. Some of the related survey questions and answers were combined in the following results. The percentages of respondents and the number of respondents are listed for each question when appropriate.

The Site

1. What is the length of the trail?

   Average length = 8.2 miles
   Range = .38 - 50 miles

2. What type of terrain does the trail pass through?

   Residential area..... 9 (56%)
   Urban..... 8 (50%)
   Commercial area..... 8 (50%)
   Rural terrain..... 6 (38%)
   Industrial area..... 5 (31%)
   Agricultural area..... 5 (31%)
   Nature preserve..... 5 (31%)
   Suburban terrain..... 4 (25%)

   Note: Trail managers usually identified more than one type of terrain through which their trail passed.

3. For how many miles does the trail run alongside an active rail corridor?

   Average = 3.7 miles
   Range = .38 - 18 miles

   Adjacent 50% or more of their length..... 13 (81.5%)
   Adjacent less than 50% of their length..... 3 (18.5%)

4. How wide is the full rail-with-trail corridor?

   Average = 188 feet
   Range = 18 - 1,500 feet

   0-30 feet..... 2 (12.5%)
   31-60 feet..... 4 (25%)
   61-100 feet..... 4 (25%)
   101-150 feet..... 1 (6%)
   151-200 feet..... 3 (19%)
   Greater than 200 feet..... 1 (6%)
   Not applicable..... 1 (6%)

Note: The manager of the Elk River Trail responded "N/A" because the trail is in county park land adjacent to the rail corridor.

5. How wide is the trail?

Average trail width = 10 feet
Range = 8-14 feet

8 feet..... 5 (31%)
9 feet..... 2 (12.5%)
10 feet..... 7 (44%)
14 feet..... 2 (12.5%)

6. What is the distance between active track and trail? (Measurement is from the centerline to the nearest edge of the trail.)

Average distance = 49 feet
Range = 8-200 feet

Distance of 8-12 feet..... 4 (25%)
Distance of 13-20 feet..... 1 (6%)
Distance of 21-50 feet..... 7 (44%)
Distance of 51-90 feet..... 1 (6%)
Distance of 91-100 feet..... 2 (12.5%)
Distance of greater than 101 feet..... 1 (6%)

7. Is there a barrier separating the tracks and trail?

Yes..... 13 (81%)
No..... 3 (19%)

Vegetation as a barrier..... 7 (44%)
Grade separation..... 6 (37.5%)
Chain link fence..... 3 (19%)
No separation..... 3 (19%)
Ditch..... 2 (12.5%)
Wire fence..... 1 (6%)
Split rail fence..... 1 (6%)
Cement wall..... 1 (6%)

Note: Many trail managers identified more than one type of separation.

8. Does the trail cross the tracks?

Yes.. 8 (50%)
No... 8 (50%)

The Average number of crossings = 1.4
The Range = 0-5

Note: All crossings were at-grade with one exception; the Illinois Prairie Path has an above-grade (bridge) crossing over the mainline. Five (62%) of those trails with at-grade crossings have warning signs for trail users.

Rail Operation

9. What railroad or agency owns the adjacent active rail corridor?

Class I (major freight) railroad..... 8 (50%)
Other public agency (i.e. a city or university)..... 4 (25%)
Public transit agency..... 3 (19%)
Short line..... 1 (6%)

Note: The Rose Canyon Bike Path is now adjacent to a publicly-owned active rail corridor, but when the trail was built the corridor was owned by Sante Fe Railway.

10. Did the railroad oppose creation of the trail?

Yes..... 1 (6%)
No..... 15 (94%)

Note: After completion of the trail, no manager reported the railroad as unfavorable towards the trail.

11. What type of rail line does the trail run alongside?

Mainline..... 7 (44%)
Industrial spur..... 4 (25%)
Mass transit line..... 3 (19%)
Branch line..... 2 (12.5%)
Trolley line..... 1 (6%)

Note: The manager of the Southwest Corridor Park Trail indicated that the trail runs alongside both a mainline and a mass transit line.

12. Approximately how frequently do trains run on adjacent tracks?

3-9 trains per hour..... 2 (12.5%)
1-2 trains per hour..... 4 (25%)
9-16 trains a day..... 1 (6%)
4-8 trains a day..... 2 (12.5%)
1-3 trains a day..... 3 (19%)
1-4 trains a week..... 2 (12.5%)
1-2 trains a month..... 1 (6%)
Out of service..... 1 (6%)

Note: The manager of the Elk River Trail responded that the adjacent rail is currently out of service, but service may resume in the future.

13. Do peak hours of rail use correspond with peak hours of trail use?

Yes..... 2 (12.5%)
No..... 8 (50%)
Occasionally..... 2 (12.5%)
Unknown..... 3 (19%)
Not applicable..... 1 (6%)

14. What is the approximate maximum train speed?

The average maximum train speed = 31 mph
Range = 10-80 mph

Uses

15. What uses are permitted?

Walking/hiking/jogging..... 16 (100%)
Bicycling..... 16 (100%)
In-line skating..... 9 (56%)
Cross country skiing..... 7 (44%)
Equestrian..... 2 (12.5%)
Snowmobiling..... 2 (12.5%)

16. Are any uses prohibited because the trail is adjacent to an active rail line?

Yes..... 0%
No..... 100%

17. Approximate number of trail user-days annually?

Average = 355,717
Range = 30,000 - 1.5 million

Note: Only six managers had information to respond to this question.

Liability Insurance

18. Is the trail insured against liability?

Yes, self-insured..... 10 (63%)
Yes, private insurance..... 5 (31%)
No..... 1 (6%)

19. Is your agency required to indemnify the rail carrier against liability?

Yes..... 1 (6%)
No..... 15 (94%)

Note: Only the Libba Cotton Trail was required to indemnify the railroad against liability.

20. Was insurance difficult to acquire?

Yes..... 0%
No..... 100%

Accidents

21. Have any train-related accidents occurred on the trail? (This question includes only those accidents caused by the path being adjacent to an active rail line, such as direct train-user collisions or accidents caused by debris left on the path by the railroad.)

Yes..... 1 (6%)

No..... 15 (94%)

Note: Only the Illinois Prairie Path reported a train-related accident. Ten years ago, a bicyclist was injured when she ignored bells and flashing lights and rode around a lowered crossing gate at a street/railroad grade crossing adjacent to the trail.

22. Were any train-related accident claims filed against your agency?

Yes..... 1 (6%)
No..... 15 (94%)

Note: Only the manager for the La Crosse River State Trail reported a train-related accident claim filed against the trail. An adjacent landowner's farm animal broke through the trail's right-of-way fence and was hit and killed by a train.

23. Are you aware of any claims being filed against the railroad?

Yes..... 0%
No..... 100%

Maintenance

24. Who is primarily responsible for trail maintenance?

City or town..... 9 (56%)
County..... 4 (25%)
State..... 2 (12.5%)
Friends of the trail group..... 1 (6%)

Note: Two county-maintained trails, the Illinois Prairie Path and the Grandview/ Sunnyside Pathway, also receive assistance for trail maintenance from friends of the trail groups.

25. How much is spent on maintenance annually?

Average = $48,312.50
Range = $1,000 - $200,000

Note: Only eight trail managers responded to this question.

26. Does the railroad help maintain the corridor?

Yes..... 2 (12.5%)
No..... 14 (87.5%)

Note: The Pedestrian Pathway's manager noted the railroad clears brush and sprays weeds along the tracks and along the side of the corridor without the trail. Because of the need to prevent brush fires in the summer, the railroad's assistance in brush and weed removal saves the managing agency from sole responsibility of clearing the entire corridor.

The manager for the Southwest Corridor Park Trail reported they negotiated an agreement with the parallel transit agency in which the agency assists in litter removal along the trail easement; this saves the trail managing agency approximately $50,000 annually. Upon expiration of this agreement in two years, the Southwest Corridor Park Trail will assume full responsibility for litter and trash removal.

27. Does railroad maintenance infringe upon the trail corridor?

Yes... 3 (19%)
No... 13 (81%)

Note: The three trail managers who responded "yes" to this question have occasional problems with railroad maintenance vehicles using the trail surface to access the railroad tracks.

Corridor Acquisition

28. Does your agency own the trail corridor?

Full ownership..... 11 (69%)
Partial ownership..... 3 (19%)
No ownership..... 2 (12.5%)

Note: Partial ownership means the managing agency owns part of the trail and received an easement or unofficial permission for the remainder.

29. If yes, how much did you pay for it?

$0..... 7 (50%)
Between $60,000 - $555,000 ($311,020 average)..... 5 (36%)
Cost unknown..... 2 (14%)

30. Did you obtain an easement?

Of those not claiming full ownership:
A partial easement was obtained by..... 2 (40%)
A full easement was obtained by..... 2 (40%)
Unofficial permission was obtained by..... 1 (20%)

Note: The managing agency for the Pedestrian Pathway has unofficial permission to use part of the railroad's right-of-way for a trail because the railroad intends to sell the entire corridor to the city in the future.

31. How was your trail funded?

City funds..... 7 (44%)
County funds..... 5 (31%)
State funds..... 5 (31%)
Federal funds..... 5 (31%)
Private sources..... 5 (31%)

Note: Most trail managers identified more than one source. For specific funding sources, see survey responses at end of study.

RAILS-WITH-TRAILS SURVEY

Site Description

Trail Name	City	County	State	Date opened	Trail length in miles
Celina/Coldwater Bike Trail	Celina and Coldwater	Mercer	Ohio	1986	4.6
Duwamish Trail	Seattle	King	Washington	1988	4.5
Grandview/Sunnyside Pathway	Grandview/Sunnyside	Yakima	Washington	1991	6.3
Green Bay Trail	Highland Park	Lake	Illinois	1966-1981	9.5
Heritage Trail	Dubuque to Dyersville	Dubuque County	Iowa	1985	27.0
Illinois Prairie Path	Metropolitan Chicago	DuPage, Kane and Cook	Illinois	1966	50.0
La Crosse River State Trail	Sparta and Medary	Monroe and La Crosse	Wisconsin	1987	21.5
Libba Cotton Bikepath	Carrboro	Orange	North Carolina	1982	0.38
Pedestrian Pathway	Issaquah	King	Washington	1989	1.17
Rock Island Trail	Colorado Springs	El Paso	Colorado	1991	3.0
Rose Canyon Bike Path	San Diego	San Diego	California	1976	1.2
Southwest Corridor Park	Boston	Suffolk	Massachusetts	1987	4.7
The Elk River Trail	Charleston	Kanawha	West Virginia	1991	1.0
Traction Line Recreation Trail	Morris Township	Morris	New Jersey	1986	2.0
Waterfront Trail	Seattle	King	Washington	1989	0.8
Zanesville Riverfront Bikepath	Zanesville	Muskingum	Ohio	1989	2.9

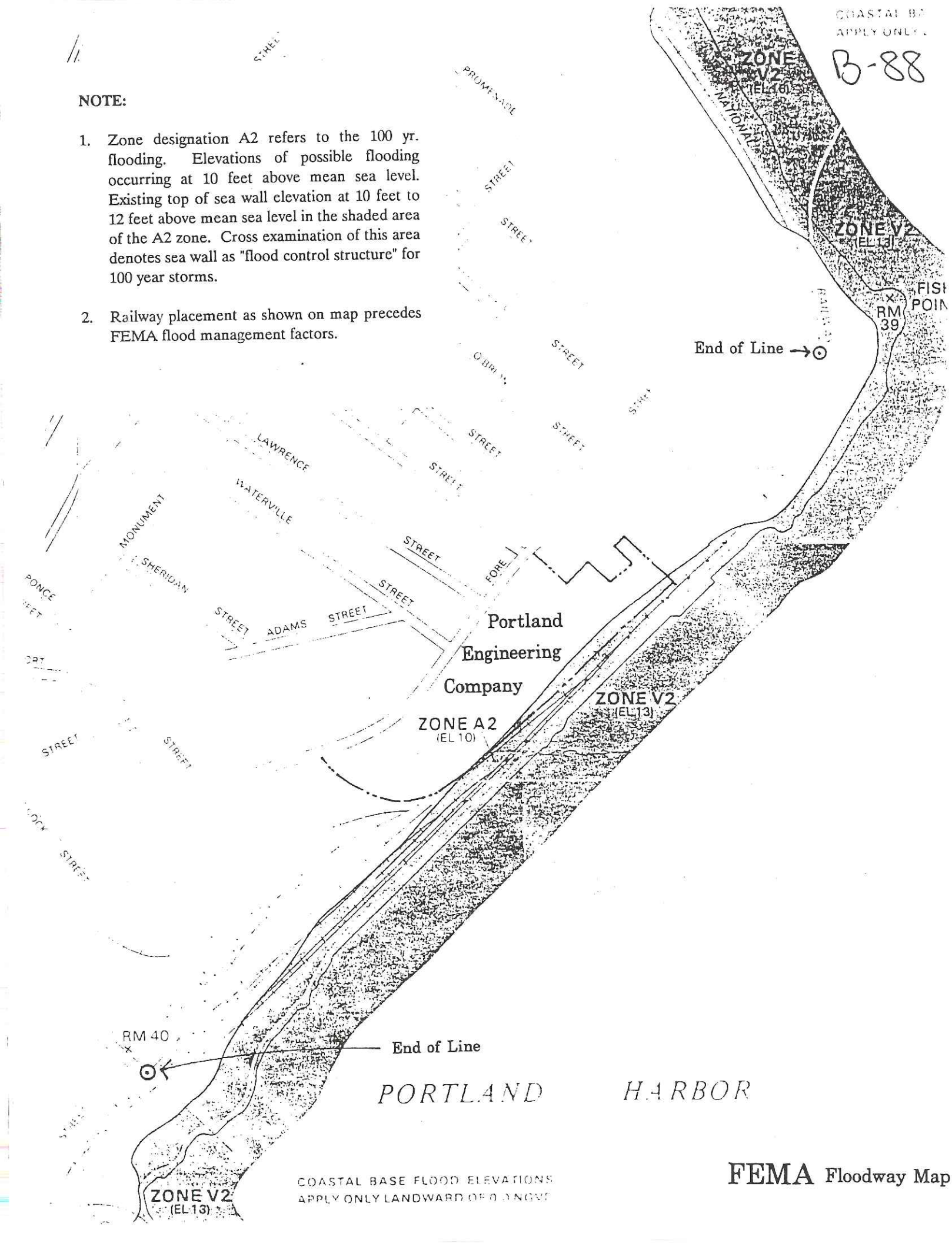
B & I

Trail Name	Type of terrain through which trail passes	Miles trail parallels active rail corridor	Full width of rail-with-trail corridor	Trail width
Celina/Coldwater	Rural and agricultural	4.6	120 ft	10 ft
Duwamish	Urban, residential, commercial, industrial and nature preserve	1.5	18 ft	8-10 ft
Grandview/Sun	Rural	6.3	40 ft avg.	8 ft
Green Bay	Urban, suburban and residential	3.7	100 ft	10 ft
Heritage Trail	Rural, agricultural and nature preserve	2.5	200 ft	10 ft.
Illinois Prairie	Rural, suburban, residential, commercial, industrial, agricultural and nat. preserve	5.0	166 ft avg.	8-10 ft
La Crosse River	Rural, industrial, agricultural and nature preserve	18.0	200 ft	10 ft
Libba Cotton	Urban and commercial	0.38	54 ft	14 ft
Pedestrian Path	Urban, residential and commercial	1.17	60 ft.	8 ft
Rock Island	Urban, residential and commercial	3.0	100 ft.	10 ft.
Rose Canyon	Suburban and industrial	1.2	1,500 ft	10 ft
Southwest Corr.	Urban, residential, commercial and industrial	3.5	100 ft min.	8 ft
Elk River	Nature Preserve (Park)	1.0	N/A	12-15 ft
Traction Line	Urban, suburban, residential and commercial	1.8	40 ft	10 ft.
Waterfront	Urban, residential and commercial	0.8	18 ft	8 ft
Zanesville	Rural and residential	2.9	100 ft	8 ft

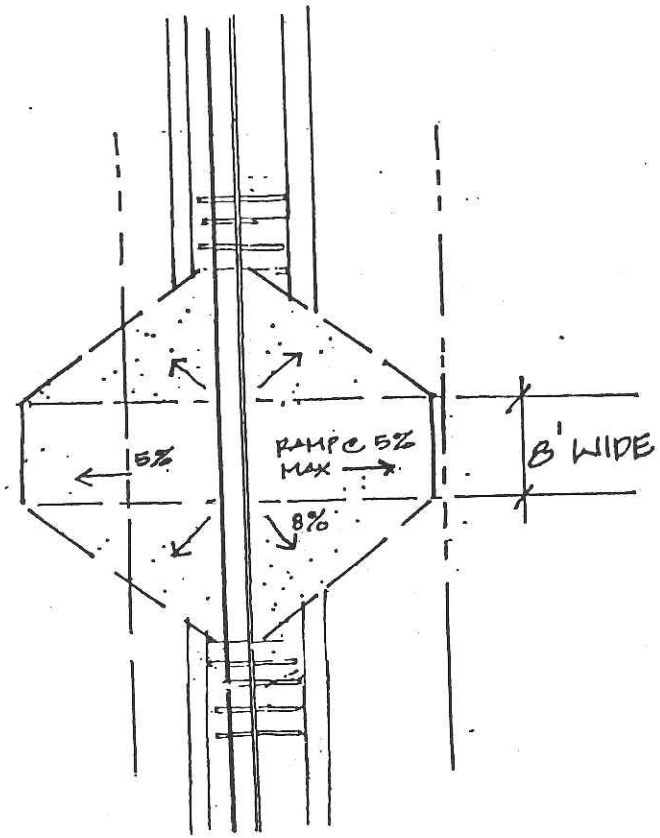
Trail Name	Distance between track and trail	Barriers between track/trail	What form
Celina/Coldwater	60 ft with a few sections as close as 15 ft	Yes	Wire fence, or ditch with standing water and vegetation
Duwamish	8 to 15 ft	No	N/A
Grandview/Sun	30 ft	Yes	Vegetation and grade separation
Green Bay	50 ft avg.	Yes	Vegetation and grade separation
Heritage Trail	90-100 ft	Yes	Steep ditch, large hills and praire/forest vegetation
Illinois Prairie	100 ft, with a few sections as close as 25 ft	Yes	Generally a 50 ft buffer zone of trees
La Crosse River	100 ft	Yes	Vegetation and grade separation
Libba Cotton	12 ft	No	N/A
Pedestrian Path	9 ft avg.	No	N/A
Rock Island	30 ft	Yes	Some grade separation
Rose Canyon	200 ft average, 100 ft at closest point	Yes	Vegetation and grade separation (10-20 ft)
Southwest Corr.	20-50 ft	Yes	Cement wall and chain link fence
Elk River	15-60 ft	Yes	Grade separation, 15-70 ft
Traction Line	18.5 ft min	Yes	Chain link fence
Waterfront	8 ft	Yes	Split rail fence
Zanesville	Varies between 15-70 ft	Yes	Chain link fence

Accidents

Trail Name	Any user/train accidents?	Describe	Any claims filed against your agency?
Celina/Coldwater	No	N/A	No
Duwamish	Not aware of any	N/A	No
Grandview/Sun	No	N/A	No
Green Bay	No	N/A	No
Heritage Trail	No	N/A	No
Illinois Prairie	Yes	Bicyclist injured; hit by train at street/RR grade x-ing	No
La Crosse River	No	N/A	Yes, livestock hit and killed by train
Libba Cotton	No	N/A	No
Pedestrian Path	No	N/A	No
Rock Island	No	N/A	No
Rose Canyon	Not aware of any	N/A	Not aware of any
Southwest Corr.	No	N/A	No
Elk River	No	N/A	No
Traction Line	No	N/A	No
Waterfront	Not aware of any	N/A	Not aware of any
Zanesville	No	N/A	No

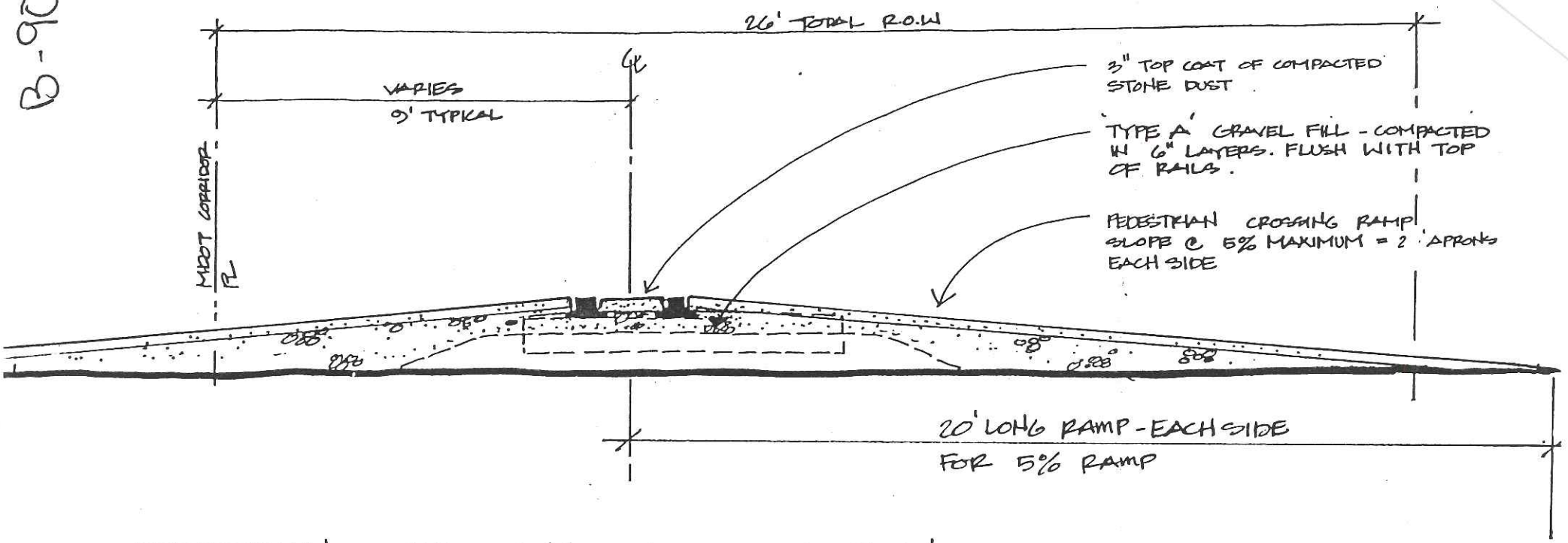

NOTE:
1. Zone designation A2 refers to the 100 yr. flooding. Elevations of possible flooding occurring at 10 feet above mean sea level. Existing top of sea wall elevation at 10 feet to 12 feet above mean sea level in the shaded area of the A2 zone. Cross examination of this area denotes sea wall as "flood control structure" for 100 year storms.
2. Railway placement as shown on map precedes FEMA flood management factors.
B-88
ZONE V2 (EL 16)
ZONE V2 (EL 13)
RM 39
End of Line
LAWRENCE
WATERVILLE
MONUMENT
SHERIDAN
PONCE
ADAMS
STREET
Portland Engineering Company
ZONE A2 (EL 10)
ZONE V2 (EL 13)
RM 40
End of Line
PORTLAND HARBOR
ZONE V2 (EL 13)
COASTAL BASE FLOOD ELEVATIONS
APPLY ONLY LANDWARD OF O.N.G.V.D.
FEMA Floodway Map

B-86



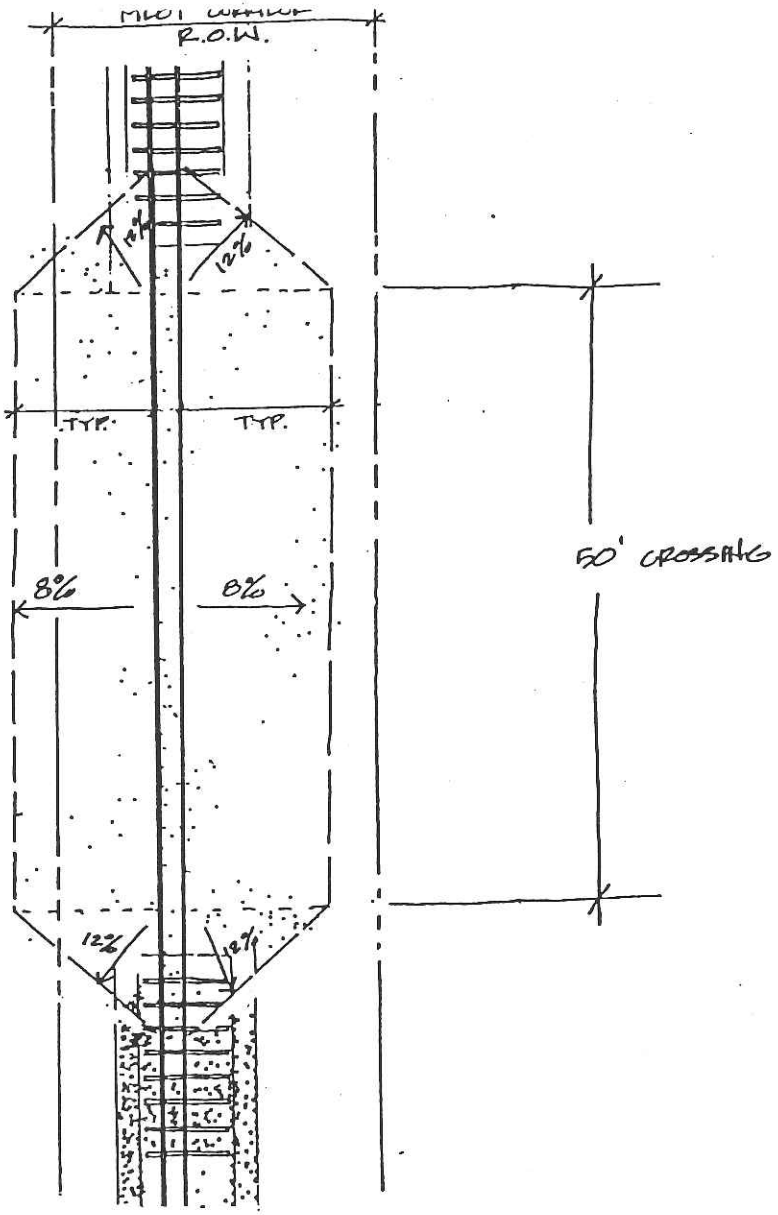
PEDESTRIAN CROSSING - 8' PLAN VIEW

B-90



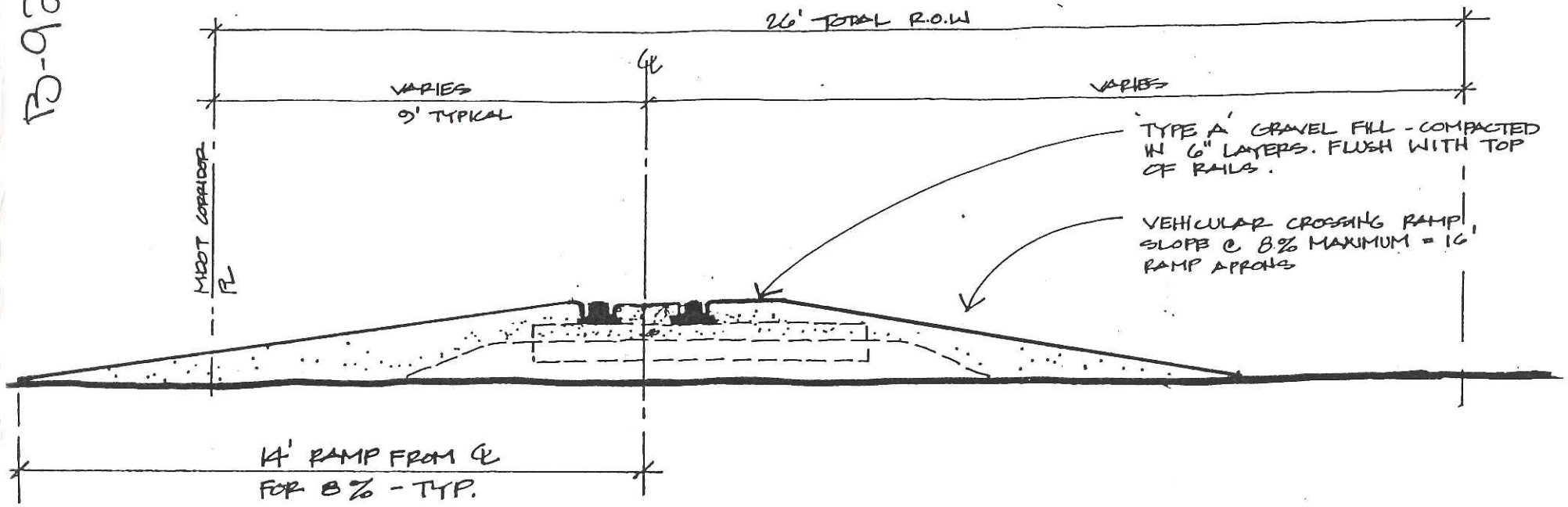
PEDESTRIAN CROSSING - CROSS SECTION

D-61

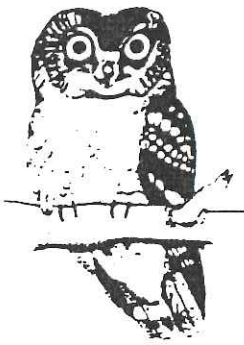


VEHICULAR CROSSING - 50' PLAN VIEW

B-98



VEHICULAR CROSSING - CROSS SECTION



RECEIVED
JUN 01 1994

Woodlot Alternatives, Inc.

B-93

27 May 1994

Stephen B. Mohr
Mohr & Seredin
18 Pleasant Street
Portland, Maine 04101

RE: Narrow Gauge Railway, Portland, Maine

Dear Steve:

As requested, I surveyed the site of the proposed Narrow Gauge railway in Portland to determine if there was any high value wildlife or wetland habitat in the areas proposed for use. In short, the area I surveyed this morning is highly disturbed habitat that contains very little wildlife value. It is characteristic of an area that principally provides habitat for introduced wildlife species capable of tolerating high degrees of human disturbance (i.e. pigeons, starlings, house finches, English sparrows). The few "wetlands" that I observed on-site were man-made and not regulated by the Maine Department of Environmental Protection (DEP). Below I will briefly elaborate on my findings.

Wildlife Habitat

The Maine Natural Resources Protection Act (38 M.R.S.A. Sections 480) and the Site Location of Development Law (Chapter 371-379) regulate activities that may impact significant wildlife habitat or unusual natural areas. Significant wildlife habitats include habitats for state and federal endangered and threatened species, high and moderate value deer wintering areas and travel corridors, high and moderate value waterfowl and wading bird nesting and feeding habitat, some Atlantic sea-run salmon habitat, and some shorebird and seabird habitats. None of these features are known to occur on the Narrow Gauge Railway site. Furthermore, it is my opinion that none of these features occur on the highly disturbed site.

Wetlands

The U.S. Army Corps of Engineers (ACE) and the U.S. Environmental Protection Agency (EPA) regulate the disposal of dredged and fill material into wetlands of the United States under Section 404 of the Clean Water Act. Federal jurisdictional wetlands are "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of

54 Cumberland Street • Brunswick, Maine 04011 • 207-729-1199 • Fax 207-729-2715

vegetation typically adapted for life in saturated soil conditions" (33 CFR Parts 320-330). Under the NRPA, the DEP regulates the following activities in, and near, jurisdictional wetlands and streams: a) dredging, bulldozing, removing or displacing soil, sand, vegetation or other materials; b) draining or otherwise dewatering; c) filling; or d) any construction, repair or alteration of any permanent structure. DEP jurisdictional wetlands include all coastal wetlands and freshwater swamps, marshes, bogs and similar areas that are. a) Of 10 or more contiguous acres, or of less than 10 contiguous acres and adjacent to a surface water body, excluding any river stream, or brook such that in a natural state, the combined surface area is in excess of 10 acres; and ... b) inundated or saturated by surface or ground water at a frequency and for a duration sufficient to support, and which under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils; and ... c) not considered part of a great pond, coastal wetland, river, stream, or brook.

The only wetlands that I observed on the site were man-made drainage ways that appear to have been created when the original railroad bed was constructed. The small wet pockets, typically only a few feet wide, were all much less than an acre in size, and therefore are not subject to regulation by the DEP. These areas would be regulated by the ACE, even though they appear to be man-made and are of limited functional value.

Summary

The area proposed for use as a Narrow Gauge railway does not contain any significant wildlife habitat, and is not acting as habitat for any particularly high value wildlife. Several very small, low value man-made wetlands occur in areas immediately adjacent to the old railroad bed. It appears as though the Narrow Gauge railway can be constructed without impacting these wetlands.

Should you have any questions, please call.

Respectfully,
Woodlot Alternatives, Inc.

John P. Lortie
Wildlife Biologist and Botanist

Attachments: Resume
Qualifications and Experience

B-95

RESUME

J. Emmons Lancaster, Jr.
666 Dutton Hill Road
P. O. Box 377
Gray, Maine 04039

Telephone: 207 657-3293

EDUCATION

CLARK SCHOOL, Hanover, NH - Graduated 1951

UNIVERSITY OF NEW HAMPSHIRE, B. S. in Civil Engineering 1955

OTHER EDUCATION (Workshops, Seminars, CED Courses)

NATIONAL HIGHWAY INSTITUTE - Fracture Critical Bridge Members - 1993
AMERICAN RY. ENGR. ASSOC. - Prep. of RR Bridges for 125 Ton Cars - 1993
UNIVERSITY OF WISCONSIN - Managing Track Maintenance - 1992
Bridge Inspection - 1987
GEORGE WASHINGTON UNIVERSITY - Bridge Inspection and Repair - 1983, 1991

WORKSHOPS

Rail Stress Analysis, Rail Failure Frequency Studies, Foundation Design, Use of Strain Gauges, Structural Steel Design, Boiler Operations and Energy Conservation, Watershed Control, Application of Federal Safety and Hazardous Materials Handling Regulations, Personal Injury and Incident Investigation.

American Railway Engineering Assoc. Technical Conferences - 1987, 1990, 1991, 1992, 1993.
Roadmasters' and Bridge and Building Assoc., Technical Conferences - 1990, 1991, 1992, 1993.

EXPERIENCE

CONSULTING ENGINEER - RAILWAY CIVIL/STRUCTURAL - 1970 to Present.

MAINE NARROW GAUGE RAILROAD COMPANY AND MUSEUM
Superintendent of Operations 1993 to Present

R. H. POTTER ASSOCIATES (Railway Civil Engineers)
Director and Associate - 1970 to Present

CONWAY SCENIC RAILROAD, INC.
Vice President, Engineering - 1968 to Present

ST. LAWRENCE & ATLANTIC RAILROAD CO.
Chief Engineer, 1989 to 1992.

GUILFORD TRANSPORTATION INDUSTRIES
Chief Engineer, Bridges and Buildings - 1989
Engineer, Bridges and Buildings, East - 1987 - 1989

BOSTON & MAINE RAILROAD:
Supervisor, Bridges and Buildings - 1984 - 1987

MAINE CENTRAL RAILROAD:
Assistant Engineer of Structures, Asst. Clearance Engineer 1974 - 1984
Supervisor, Bridges and Buildings - 1963 - 1974
Assistant Supervisor Bridges & Buildings - 1961 - 1963
Assistant Engineer (Jr. Engineer) - 1957 - 1961
Chainman, Rodman, Instrumentman - 1954 - 1957

NEW HAVEN RAILROAD
Chainman (School Vacation Position) 1952 - 1953

EDAVILLE RAILROAD
Passenger Trainman (School Vacation Position) 1949 - 1950

RESPONSIBILITIES

Primary responsibilities of above positions included design, rating, construction and repair of railroad bridges, culverts, buildings, trackage and pollution control facilities; supervision of maintenance of way and signal forces; supervision of track and signal inspection and construction; responsibility for compliance with and recordkeeping for Federal Railroad Administration and Maine, New Hampshire and Vermont Departments of Transportation track, signal and environmental requirements; cost estimating, scheduling, negotiation with contractors, bid supervision and purchase of materials for major construction projects; writing of rule books and timetables; instructing and supervising in the fields of railroad employee safety, train operations and track and bridge inspection; participation in permanent safety committees; assistance in development of management plans and start-up of new railroad operations; involvement in containment and cleanup of environmental incidents; appraisals of railway freight, passenger and maintenance equipment for railroads and museums; approved to perform insurance company safety inspections on Shortline and Tourist railroads.

PROFESSIONAL AFFILIATIONS:

American Society of Civil Engineers
American Railroad Engineers Association
Member of Shortline Committee
Chair of Sub Committee on track and bridge inspection recommendations.
American Railway Bridge & Building Association
Roadmasters and Maintenance of Way Association of America
New England Railroad Club
Operation Lifesaver (Highway-Rail Grade Crossing Safety Program)
Maine State Co-Coordinator - 1992 to Present
Tourist Railway Association, Inc. (T.R.A.I.N.)
Director - 1990 to Present
Chairman, Engineering Committee - 1985 to Present
Chairman, By-Laws Committee - 1991-1992

PROFESSIONAL LICENSES:

State of Maine, Professional Engineer #1729 - 1961 to Present
State of New Hampshire, Professional Engineer #3275 - 1970 to Present
State of Maine, Registered Land Surveyer #221 - 1968-1992
Commonwealth of Massachusetts, Construction Supervisor - 1986 to Present

B-97

SUSAN ROMATZICK

PERMANENT ADDRESS

RR #3, Box 430
Wood's Grove
Winthrop, ME 04364

(207) 377-9634

EDUCATION

May 1988 Successfully passed Qualifying Exam and completed 43 of 48 course credits towards Ph.D. in Environmental Science at Cook College, Rutgers University, New Brunswick, New Jersey.

May 1982 M.S., Civil Engineering, Civil Engineering Department, University of Maine at Orono.

May 1978 B.S. Environmental Science, Cook College, Rutgers University, New Brunswick, New Jersey.

June 1974 Jonathan Law High School, Milford, Connecticut.

SCHOLARSHIPS AND HONORS

Employee of the Month Award for Sustained Exceptional Performance of Departmental Duties, August, 1989.

Special Merit Award for Sustained Exceptional Performance of Departmental Duties, September 10, 1986.

Outstanding Senior Woman for the Class of 1978, Cook College.

Four year recipient of the Marcellus Hartley Dodge Memorial Scholarship from the Dupont Company while doing undergraduate work at Rutgers University.

Member of Alpha-Zeta, an honor and service fraternity since October 1976.

Four year member of Cook College Student Government; President, 1976-77; Treasurer, 1975-76.

CAREER RELATED EXPERIENCE

August 1990 - Present: Instructor, Environmental Technology Program, Southern Maine Technical College, South Portland, Maine.

My responsibilities include the development and teaching of six college level courses to freshman and senior students. The topics range from hazardous waste management to analytical techniques to environmental law and regulation.

January 1990 - Present: Owner, Paladin Environmental, Winthrop, Maine.

My responsibilities include development of field sampling protocols, evaluation of process control and laboratory problems at domestic and industrial wastewater treatment facilities, identification of filamentous bacteria types in activated sludge, and the providing of both technical assistance and training to operators and the public in the areas of process control, troubleshooting and laboratory analysis.

CAREER RELATED EXPERIENCE (Continued)

January 1990 - August 1990: Environmental Specialist 4, Maine Waste Management Agency, Augusta, Maine.

My responsibilities have been to draft the siting criteria for new landfills and incinerators in the State of Maine. These criteria were adopted by the state's Facility Siting Board on May 16, 1990. Other duties include reviewing applications for new landfills submitted to the agency for approval and determining compliance with agency siting criteria. Responsible for coordinating agency use of Geographic Information System. Assisted with development of the Household Hazardous Waste Collection Program.

September 1988 - December 1988: Teaching Assistant, Pollution Microbiology Lab, Dept. of Environmental Science, Cook College, Rutgers University.

My responsibilities included all laboratory set up, instruction, and grading all laboratory exercises for a two-credit class of 25 upperclass and graduate students. In addition, graded all exams for the corresponding pollution microbiology course taught by Dr. Melvin Finstein.

January 1984 - January 1990: Assistant Engineer, DEP-Bureau of Water Quality Control, Division of Operation and Maintenance, Augusta, Maine.

My responsibilities include the generation of technical evaluations and reports in the areas of process control, laboratory and management of wastewater treatment plants. In addition, I am responsible for coordinating staff during treatment plant evaluations. Other responsibilities include providing technical assistance and training to other DEP staff, wastewater treatment plant operators, town officials, the general public and representing the state at public functions. I am also the inspector for several wastewater treatment plants and responsible for reviewing the design of new treatment facilities as well as their operation and maintenance manuals to insure the facilities will function as required.

November 1982 - January 1984: Chemist, Kennebec Sanitary Treatment District, Waterville, Maine.

I was responsible for managing the laboratory which included supervising laboratory staff as well as planning and scheduling all laboratory activities. In addition, my responsibilities included monitoring domestic, industrial and sludge utilization activities and evaluation of the facility's process control strategy. This work required not only managerial skills but also familiarity with standard chemical, biological and trace metal analysis. I also was responsible for implementing the quality control and surveillance programs and supervising the industrial pre-treatment and surveillance program.

June 1982 - November 1982: Research Technician, Center for Marine Studies, University of Maine at Orono.

I did research on a volunteer basis for Dr. Gary King and Dr. Lawrence Mayer. Work involved analyzing sediment samples for methane production, sulfate reduction, specific surface area and for total protein and DNA content. Both chemical and microbiological techniques were utilized to perform these analyses.

September 1979 - September 1981: Graduate Research Assistant, Department of Civil Engineering, University of Maine at Orono.

I did my masters work under the direction of Dr. Jerry D. Lowry. The title of my thesis was "The Use of Ultraviolet Light as an Alternative to Chlorination in Small Wastewater Treatment Systems". Work for this project included the design and development of an ultraviolet disinfection unit; evaluation of the ultraviolet unit's capabilities under both laboratory and field conditions; organizing and implementing the sampling program; and, supervising a part-time undergraduate student.

July 1981 - September 1981: Research Technician, Department of Civil Engineering, University of Maine at Orono.

I did consultant work for Dr. Chet A. Rock. My main responsibility was the analysis of sardine factory wastewater for oil content and for total suspended solids. Over 200 samples were analyzed during this study.

CAREER RELATED EXPERIENCE (Continued)

October 1980 - December 1980; Research Technician, Department of Civil Engineering, University of Maine at Orono.

I worked with Dr. Chet A. Rock on a project for which he was consultant. In coordination with two other graduate students, we set up four biological waste treatment reactors. We acclimated the bacteria in these reactors to an industrial solvent mixture which served as their food source. During this study, my responsibilities included general feeding and maintenance of these reactors along with daily preparation and analysis of all BOD_5 samples.

May 1978 - August 1979; Research Technician, Department of Environmental Science, Rutgers University, New Brunswick, New Jersey.

I shared responsibility with another research technician for the coordination of sampling and analysis of ground and surface water samples and sediment samples for PCB and pesticide analysis. In addition, my responsibilities included the operation and maintenance of all laboratory equipment, reviewing data for accuracy, training new employees, and assisting in the development of sampling protocol and analytical techniques for the analysis of trace organics in sediments. During the summer of 1979, I supervised eight undergraduate technicians and during the summer of 1978, I co-supervised twelve undergraduate technicians. I also coordinated the final report for the Potable Water Project being prepared for the New Jersey Department of Environmental Protection.

June 1977 May 1978; Research Assistant, Department of Environmental Science, Rutgers University, New Brunswick, New Jersey.

During the summer of 1977, I was a full-time research assistant. My duties included both the sampling and preparation of ground and surface water samples for trace organic analysis. I worked part-time during the academic year. My main responsibility was the preparation of all containers and equipment for trace organic sampling.

OTHER WORK/VOLUNTEER EXPERIENCE

April 1986 - Present; Planning Board Chairwoman, Winthrop, Maine.

During this time, the Board undertook the re-writing of Winthrop's Comprehensive Plan which has been approved by the Town Council. In addition, the Board is making major revisions to the town Zoning Ordinances.

June 1980 - June 1982; Minister of Music, Our Lady of Wisdom Parish, Newman Center, Orono, Maine.

My responsibilities included the coordination and supervision of four music groups, the organization of two music workshops each year, and assisting the pastor with planning any special liturgies.

ADDITIONAL PROFESSIONAL TRAINING

April 19, 1984	"*AC Variable Frequency Drives*", 6 hours, Maine Wastewater Control Association
May 8, 1984	"*Submersible Pump Technical Seminar*", 8 hours, Maine Wastewater Control Association
June 11-15, 1984	"*Optimizing Process Control of Activated Sludge Systems*", 35 hours, New England Regional Wastewater Institute
July 23-24, 1985	"*Odor Control in Wastewater Treatment Systems*", 15 hours, New England Regional Wastewater Institute

ADDITIONAL PROFESSIONAL TRAININD (continued)

November 7, 1985	*"You and the New Chemical Substance I.D. Law"*, 6.5 hours, Maine Joint Environmental Training Coordinating Committee
February 5-6, 1986	*"Management Practices"*, 12 hours, Maine Joint Environmental Training Coordinating Committee
February 13, 1986	*"Financial Management"*, 6 hours, Maine Joint Environmental Training Coordinating Committee
March 11, 1986	*"Negotiation Skills at Work"*, 7 hours, Maine Department of Personnel
April 16-18, 1986	*"Chlorination and Dechlorination of Wastewater Effluents"*, 18 hours, New England Regional Wastewater Institute
December 3, 1986	*"Pretreatment Program Implementation"*, 6 hours, U.S. Environmental Protection Agency
February 11, 1987	*"Assertiveness Training"*, 7 hours, Career Track Seminars
April 16 & May 12, 1987	*"Myers-Briggs Type Indicator"*, 10 hours, Maine Department of Personnel
June 21, 1987	*"Composting -- Rutgers Strategy"*, 6 hours, Maine Joint Environmental Training Coordinating Committee
May 25-26, 1989	*"Identification of Filamentous Organisms in Activated Sludge"*, 15 hours, New England Regional Wastewater Institute

PRESENTATIONS AND PUBLICATIONS

May 16, 1985	*"Maine's Approach to Identifying Problems at Municipal Wastewater Treatment Facilities"*, 3 hour presentation, U.S. Environmental Protection Agency, Region I, Operation and Maintenance Meeting.
June 21, 1985	*"Troubleshooting at Wastewater Treatment Facilities Using Computer Assisted Data Evaluation"*, 3 hour presentation, New England Regional Wastewater Institute.
October 8, 1985	*"Corinna 104(g) Operator Training Evaluation"*, 4 hour presentation, Maine Department of Environmental Protection.
December 11, 1985	*"Design Considerations for the Activated Sludge Process"*, 1 hour presentation, University of Maine at Orono, Department of Civil Engineering.
March 18, 20, 31, 1987 April 14, 1987	*"How to Trouble Shoot"*, 6 hour presentation, Maine Joint Environmental Training Coordinating Committee.
May 15, 1986	*"Maine 104(g) Operator Training Program"*, 2 hour presentation, U.S. Environmental Protection Agency, Region I, Operation and Maintenance Meeting.

PRESENTATIONS AND PUBLICATIONS (continued)

June 16, 1987	*"Maine's Financial Management Evaluation Process"*, 1 hour, presentation, U.S. Environmental Protection Agency, National 104(g) Training Meeting.
June 2, 1988	*"Biological Treatment of Small Wastewater Flows"*, 4 hour presentation, Maine Department of Environmental Protection.
Fall, 1988	*Pollution Microbiology Laboratory Course* - Graduate and Undergraduate levels.
April 5, 1989	*"Stabilization Ponds and Lagoons"*, 6 hour presentation, Maine Joint Environmental Training Coordinating Committee.
April 27, 1989	*"Chlorination and Dechlorination Issues"* , 1 hour presentation, U.S. Environmental Protection Agency, Region I, Operation and Maintenance Meeting.
April 28, 1989	*"Composting Using the Rutgers Strategy"*, 1 hour presentation, U.S. Environmental Protection Agency, Region I, Operation and Maintenance Meeting.
June 12, 1990	*"Optimizing Process Control of Activated Sludge Systems"*, 8 hour lecture/laboratory on microbiology in wastewater treatment systems, New England Regional Wastewater Institute

Romatzick, Susan. *"The Use of Ultraviolet Light as an Alternative to Chlorination in Small Wastewater Systems"*, Masters Thesis, Dept. of Civil Engineering, University of Maine at Orono, May 1982 (77 pages).

Lowry, Jerry D., Romatzick, Susan. *"UV Disinfection for Onsite Sand Filter Effluent"*, Office of Water Research and Technology, U.S. Dept of Interior, Project No. A-051-ME, May 1982 (32 pages).

[a]Maine Department of Environmental Protection. *"The P.U.D. Wastewater Treatment Facility Section 104(g) Operator Training Evaluation"*, Draft Report, September 1985 (72 pages).

[a]Maine Department of Environmental Protection. *"The Corinna Water Pollution Control Facility Section 104(g) Operator Training Evaluation"*, Draft Report, September 1985 (72 pages).

[a]Maine Department of Environmental Protection. *"The Rockland Wastewater Treatment Facility Section 104(g) Operator Training Evaluation"*, Final Report, November 1986 (68 pages).

[a]Maine Department of Environmental Protection. *"The Brewer Wastewater Treatment Facility Section 104(g) Operator Training Summary Report"*, November 1986 (23 pages).

[a]Maine Department of Environmental Protection. *"The Rockland Wastewater Treatment Facility Section 104(g) Operator Training Summary Report"*, December 1986 (28 pages).

[a]Maine Department of Environmental Protection. *"The Wiscasset Wastewater Treatment Facility Section 104(g) Operator Training Evaluation"*, Final Report, December 1986 (54 pages).

[a]Maine Department of Environmental Protection. *"Operations Management Evaluation - Saco Water Pollution Control Facility"*, January 8, 1987 (15 pages).

PRESENTATIONS AND PUBLICATIONS (continued)

[a]Maine Department of Environmental Protection. "*Operations Management Evaluation - Kennebunkport Water Pollution Control Facility*", January 20, 1987 (16 pages).

[a]Maine Department of Environmental Protection. "*The Wiscasset Pollution Control Facility Section 104(g) Operator Training Summary Report*", February 1987 (24 pages).

[a]Maine Department of Environmental Protection. "*The Ogunquit Wastewater Treatment Facility Section 104(g) Operator Training Evaluation*", Final Report, April 1987 (56 pages).

[a]Maine Department of Environmental Protection. "*The Orono Wastewater Treatment Facility Section 104(g) Operator Training Evaluation*", Final Report 1987 (60 pages).

[a]Maine Department of Environmental Protection. "*The Biddeford Wastewater Treatment Facility Section 104(g) Operator Training Evaluation*", Draft Report, January 1988 (90 pages).

[a]Maine Department of Environmental Protection. "*Operations Management Evaluation - Gardiner Water Pollution Control Facility*", January 20, 1988 (7 pages).

[a]Maine Department of Environmental Protection. "*Operations Management Evaluation - Kennebunkport Water Pollution Control Facility,*" January 20, 1988 (7 pages).

[a]Maine Department of Environmental Protection. "*Operations Management Evaluation - Farmington Water Pollution Control Facility*", January 15, 1988 (8 pages).

[a]Note: Current Division policy is to exclude an author's name on technical reports. My supervisors could verify that I was the principal author of these reports.

PROFESSIONAL AFFILIATIONS

Member of New England Water Pollution Control Federation since 1979.
Member of Maine Wastewater Control Association since 1982.
Member of Association of Maine Environmental Laboratories since 1983.
Member of Annabessacook Lake Improvement Association since 1985.

REFERENCES

References will be provided upon request.

RESUME

B-103

William L. Petitjean
(206) 222-6781

P.O. Box 1118
Fall City, WA 98024

SUMMARY OF EXPERIENCE

1988 - present - The Petitjean Co., Inc.: Self-employed as a contract mechanical engineer on steam plant, food processing and material handling projects.

1986 -1988 - Pacific Concrete Products, Inc.: Employed as General Manager of a specialty concrete products manufacturer. Responsible for all administration , plant operations and sales.

1984 -1986 - Power Recovery Systems - K.W. Energy Systems: Employed as Project/Sales engineer at above firms. Responsible for mechanical specifications, engineering support to sales, equipment installation, start-up and test and prototype development on cogeneration and alternative energy systems.

1981 -1983 - Skinner Engine Company: Employed as Sales Manager, Engines for the last steam engine manufacturer in the U.S. Responsible for rebuilding sales of steam engine product line.

1974 -1981 - Kenworth Truck Co. - MacManimum, Inc. - Flow Industries: Employed as Mechanical Engineering technician at above firms. Responsible for facilities maintenance, engineering test, vendor compliance, R&D and prototype development.

1975 - 1990 - Petitjean Bros. Lumber Co.: Held a partner's interest in a family owned, steam powered, custom sawmill business.

1982 - present - Published in trade journals, developed technical and marketing reports and presented technical papers at trade conferences.

EDUCATION

Acquired a sound, experience based engineering education. I possess a working knowledge of thermodynamics, machine design, structural analysis, engineering standards and practices and computer aided design using Autocad release 12. This education includes training and "hands-on" experience in machine tool operation, metal fabrication and machine assembly, installation, start-up and test.

Green River Community College
A.A.S. Mechanical Engineering Technology 1974
A.A.S. Machine Technology 1970

University of Washington
Two years undergraduate study Forest Engineering 1970-72

Certified Mechanical Engineering Technician 1977

References Available Upon Request

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STEAM LOCOMOTIVE AND RELATED EXPERIENCE

1968 -1975: Puget Sound & Snoqualmie Valley Railroad, Lake Whatcom Railway and Skagit River Railway

Learned the locomotive trades from retired railroad machinists, boilermakers and engineers. Employed by the above excursion railroads to overhaul four locomotives. Overhauls included retubing boilers, staybolt work, changing tires, rod bushings, shoe and wedge work, setting valves, jacketing, lagging and piping.

1979 - 1992: Petitjean Brothers Lumber Company, The Petitjean Company, Inc.

Designed and installed wood burning, reciprocating steam power plant for a family custom sawmill business. This plant included a vertical firetube boiler, 12" x 14" slide valve main engine and a two cylinder carriage feed engine. Plant equipment was upgraded over the years. Additions included an underfeed wood stoker, enlarged refractory furnace with new forced draft grate system, auxiliary propane burner system, and an exhaust feedwater heater and feedwater pump. This sawmill and power plant were sold in 1992 because the family participants liquidated the sawmill real estate.

1981 - 1986: Skinner Engine Company, K.W. Energy Systems, Self-employed, Contract Mechanical Design

Sold the last new Unaflow steam engine built in the U.S.. Re-established the design basis for the Skinner Unaflow engine product line and implemented several design improvements to upgrade engine line for modern conditions. Worked with ACE coal burning locomotive project to develop a joint Skinner/ACE steam plant for Mississippi towboats. Subsequent to leaving Skinner, continued small cogeneration work with K.W. Energy Systems using steam turbines and personally developed prototype design for an inexpensive line of small, medium speed, stationary steam engines.

1986 - Present: Self-employed, Contract Mechanical Design

Contract for a wide range of mechanical system and machinery design jobs, specializing in small steam power plants of all types. Locomotive and related jobs include: contracted with the Edaville Railroad to center up valves, adjust Stephenson valve gear, and provide drawings and documentation on ex-Monson engine #3. Contracted with local sawmill to specify, purchase and install a new wood stoker in an old 200 hp dutch oven boiler. Published technical steam locomotive articles in Locomotive & Railway Preservation Magazine. Currently providing technical design support on several steam locomotive replicas and a large steam reciprocating electric drive development project. Also providing a Maine woodworking plant with set up instructions and a control system that adapts an electronic governor to a steam engine-generator drive.

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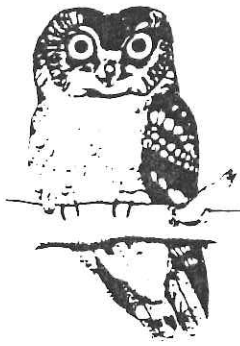

Woodlot Alternatives, Inc.

Woodlot Alternatives, Inc. (WAI) is a regionally recognized consulting group specializing in natural resource inventories and land management. The company is comprised of competent, professional staff with extensive backgrounds in wildlife management, forestry, botany, wetland and soil science, environmental regulation, natural resource management, and land-use planning. The staff of WAI have developed an excellent working relationship with Federal and State agencies, as well as numerous municipalities, local conservation commissions, commercial developers, engineers, and private land owners. Our goal is to always provide our clients with environmentally sound, state-of-the-art services and consultation.

Services

Wetlands Analysis
- Identification and Delineation
- Mitigation Plan Development
- Functional Assessment
- Determination of Regulatory Jurisdiction
- Creation, Restoration and Enhancement

Natural Resource Inventories
- Endangered and Threatened Species
- Rare Plants and Natural Communities
- Unusual Natural Areas
- Significant Wildlife Habitats
  (Deer yards, shorebird and waterfowl habitat)
- Aerial Photo Interpretation
- Landscape Analysis

Wildlife Inventory and Management
- Habitat Evaluation (HEP Certified)
- Critical Wildlife Habitat Inventory
- Wildlife Monitoring
- Habitat Enhancement
- Mitigation Plan Development

Land Management
- Resource Education
- Integrated Forest and Wildlife Plans
- Site Restoration
- Erosion and Sediment Control Plans
- Recreation/Nature Interpretation
- Phosphorous Export Modeling

Qualifications and Experience

The following is a listing of representative WAI projects and experience. Included is the name of the client, along with a brief description of the project. Inquiries concerning company qualifications and/or additional references are encouraged and may be received by contacting Woodlot Alternatives.

Inventory of the Bureau of Public Lands, Nahmakanta Management Unit - The Nahmakanta Management Unit is a 43,000 acre tract of forest, ponds, and mountains in central Piscataquis County, Maine. The Maine Bureau of Public Lands hired WAI to assist in developing a management plan for this newly purchased property. We performed a comprehensive natural resource inventory of the management unit for BPL's use in developing a management plan for the parcel.

Inventory of Nancy Brook Research Natural Area, White Mountain National Forest, New Hampshire - A survey of the flora, fauna, and natural communities of Nancy Brook Research Natural Area (RNA) was conducted during the summer and fall of 1992. Nancy Brook RNA is noted for containing the largest virgin mountain spruce-fir forests in New Hampshire, and one of the few remaining in the United States. The primary purpose of this study was to characterize major natural communities observed in the RNA.

54 Cumberland Street • Brunswick, Maine 04011 • 207-729-1199 • Fax 207-729-2715

Expert Witness Mediation Hearing: Portland, Maine - Burns & Levinson. WAI performed Standard of Care research at the Maine State Archives and Records, performed personal interviews, prepared expert reports, and presented testimony. The information WAI prepared was used to establish the Standard of Care in regards to wetland delineations during the mid to late 1980s. Reference: Michael G. Tracy Esquire 617/345-3000.

Expert Witness Court Testimony: Freeport, Maine - Town of Freeport. WAI staff provided critical, expert forestry/wildlife testimony supporting the Town of Freeport in Superior Court. Reference: Jacqueline Cohen, Town Planner, Town of Freeport 207/865-4743.

Mt. Redington Wind Farm: Redington Township, Maine - Endless Energy Corporation. WAI is conducting ecological surveys and assisting in environmental permitting in high elevation and sub-alpine natural communities for a 15 megawatt wind farm in western Maine. Surveys include: natural community assessments, wetland/vernal pool delineation/assessments, identification of Significant Wildlife Habitat, raptor migration studies, small mammal trapping, and breeding bird surveys. Reference: Harley C. Lee, President, Endless Energy Corporation, RR 2 Box 2370, New Gloucester, ME 04260 207/926-4698.

Carriage Road Rehabilitation: Acadia National Park, Bar Harbor, Maine - VHB. WAI was responsible for recreating vistas along the 54 mile long carriage road system in Acadia National Park. We developed site-specific harvesting prescriptions and low-maintenance long term management plans for vistas including erosion control methods, slope stabilization, and revegetation. Reference: Mike Williams, Project Supervisor, Acadia National Park, Bar Harbor, ME 04609 207/288-4646.

Candidate Low-Level Nuclear Waste Site Surveys: T2R9, Summit, Unity & Pittston, Maine - WAI was contracted by local communities to conduct independent ecological surveys of candidate low-level radioactive waste sites that had been previously identified by the Maine Low-Level Radioactive Waste Authority. Survey recommendations were instrumental in the eventual elimination of these areas as candidate sites. Reference: Matt Scott, Deputy Director, Maine Low-Level Radioactive Waste Authority, 99 Western Ave., Suite 6, Augusta, ME 04332-5139 207/626-3249.

Wetland Delineation and Functional Value Assessment - Loring Air Force Base - ABB Environmental Services, Inc. WAI delineated wetlands and performed WET II functional value assessments on Loring Air Force Base in northern Maine. Work on-site required OSHA-approved hazardous waste training (29 CFR 1910.120) and use of air and radiation monitoring equipment. Reference: Michael Murphy, Project Manager, ABB Environmental Services, Inc. 207/775-5400.

State Wetland Identification and Delineation Training Course - Maine Department of Economic and Community Development. WAI played a principal role in developing and presenting a Wetland Identification and Delineation Course for local Code Enforcement Officers. Several regional courses were presented, providing each CEO with classroom and field training for Certification. Reference: Linda Boothby, Office of Community Planning, DECD 207/289-6800.

Significant Wildlife Habitat Mapping: Central/Southern Maine - Maine Department of Inland Fisheries and Wildlife (MDIFW). WAI was responsible for identifying and mapping deer wintering areas, wetlands, and other Significant Wildlife Habitat throughout 40 towns in southern and central Maine. WAI continues to regularly evaluate individual properties for the presence, and absence, of regulated habitats. Reference: Gary Donovan, Director, MDIFW Wildlife Division 207/289-5252.

Proposed Landfill Sites: Eastern Maine - James River Corporation. WAI delineated and assessed U.S. Army Corps of Engineers (ACE) and State (DEP) jurisdictional wetlands on over 58 potential landfill sites within 7 towns in eastern Maine. WAI worked closely with Company engineers to assess the feasibility of constructing a landfill in compliance with Maine solid waste and Federal Clean Water Act laws. WAI provided critical mitigation and natural resource consultation and testimony at meetings with regulatory personnel. Reference: Wendy Porter, Environmental Coordinator, James River Corporation 207/827-7711.

Woodlot Alternatives, Inc. Qualifications and Experiences (continued)

Maine Department of Transportation Road Reconstruction Projects - Maine Department of Transportation (MDOT). WAI has identified and delineated all natural resource features subject to local, State, and Federal regulation for various road reconstruction project corridors throughout Maine. WAI was instrumental in assisting the MDOT in developing their own natural resource inventory and mapping process. In addition, WAI continues to work with all relevant State and Federal natural resource agencies in regard to MDOT reconstruction projects. WAI regularly prepares detailed reports, attends meetings with regulatory agencies, and develops state-of-the-art wetland and wildlife mitigation plans. Reference: William Reid, Director, Environmental Services Division 207/289-3321.

Environmental Assessments of Transmission Lines: Central and Southern Maine - Central Maine Power Company (CMP). WAI has located and assessed significant natural resources on existing and proposed transmission line right-of-ways, and other CMP properties. WAI routinely provides recommendations for State and Federal land use regulation compliance; helicopter and site surveys and delineations for wetland habitat and other sensitive areas; comprehensive erosion control recommendations and seminars; and the formulation of a company-specific Erosion Control Manual. Reference: David Dominie, Supervisor, Permitting & Licensing, CMP 207/623-3521.

Natural Resource Management Plan: Old Town, Maine - Diamond Occidental Forest Inc. (DOF)/James River Corporation. WAI, in conjunction with DOF foresters, provided James River Corporation with a timber and wildlife management plan for the 747 acre West Old Town Forest. The purpose of the plan was to enhance wildlife populations and habitat while managing and maintaining a diversity of forest types, heights, and age classes. Reference: Ted Shiga, Manager, Woodlands Division, Diamond Occidental Forest Inc. 207/827-4471.

Wetland Mapping: Old Orchard Beach, Maine - Town of Old Orchard Beach. WAI delineated all wetlands within the Town of Old Orchard Beach that met the Federal and State definitions. Each wetland was classified and rated using a computer model designed by our staff. In addition, a report describing each wetland, and recommended management plans for specific wetlands, and wetlands in general, was published. Reference: OOB Town Planner 207/934-5714.

1990 Inventory of Unique Natural Features in Oxford County - Maine Department of Economic and Community Development. WAI conducted an inventory of rare and endangered plants, and plant communities in Oxford County in 1990. WAI personnel, in conjunction with independent botanists L. Eastman and S. Holmes, performed a landscape analysis of the entire region, providing critical information on locally and regionally occurring rare plants, and rare natural communities. Reference: John Albright, Director, Natural Heritage Program 207/289-6807.

Maine Lakes Study: Organized Towns of Maine - State Planning Office. In conjunction with Drew Parkin, WAI conducted aerial and ground surveys of lakes within organized townships to determine which Maine lakes would be considered Significant natural resources. This survey involved extensive data base inventories of over 150 significant lakes, resulting in a natural resource data base able to be regularly updated and modified to meet specific planning needs. Reference: Hank Tyler, Director, Critical Areas Program 207/289-3261.

Hydro-Quebec Transmission Line Study: Western and Central Maine - Central Maine Power Company (CMP). WAI was subcontracted by The Nature Conservancy to conduct searches for selected rare plants, animals, and community types in areas along a proposed transmission line route. Collected information was instrumental to CMP's final report to project regulators. Reference: John Albright, Director, Natural Heritage Program 207/289-6807.

Woodlot Alternatives, Inc. Qualifications and Experiences (continued)

Private/Commercial Developers: Maine - WAI has delineated wetland boundaries and/or provided functional wetland assessments for over 300 subdivisions and development projects in over 100 individual Maine communities, according to local, State, and Federal wetland definitions. Projects have ranged from 1 to 3,000 acres in size. Recommendations regarding permit applications and mitigation procedures and opportunities were developed. References: Jay Clement, U.S. Army Corps of Engineers 207/623-8124; Don Witherill, Director; Division of Natural Resources, Maine Department of Environmental Protection 207/289-2111.

Private/Commercial Landowners: Maine - WAI has developed numerous integrated Forest and Wildlife Management plans that provide clients with an appraisal of their current and projected timber volumes and conditions, and furnish the basis for a multiple-resource forest management strategy. Plans are developed to meet the goals of the client, and to create a management strategy that provides for sustained yields of timber and forest-related resources. Management plans are designed to meet the requirements of the Maine Tree Growth Tax Law and the Forest Stewardship Assistance Program. Reference: Ancyl Thurston, Staff Forester; Maine Forest Service 207/289-2791.

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Woodlot Alternatives, Inc.

JOHN P. LORTIE
54 Cumberland Street
Brunswick, Maine 04011
207-729-1199

Experience and Employment History

Woodlot Alternatives, Inc: Wildlife Biologist and Botanist, Brunswick, Maine. 6/87 - Present. Founder and President of an environmental consulting firm that specializes in rare plant, animal and natural community identification and management; wetland identification, mapping, evaluation and mitigation; land management plan preparation; and natural resource land use planning. Experience includes: evaluation of potential impacts on wildlife and wetland resources from numerous projects, including highway reconstruction, hydropower development, residential development, and power transmission lines; interpretation of land use laws and determination of regulatory jurisdiction; providing guidance, training; coordinating and conducting inventory/mapping of significant wildlife habitat and wetland resources throughout Maine towns; coordination with Maine State agencies such as DOT, DEP, IFW, SPO, and LURC.

U.S. Fish and Wildlife Service: Biological Technician, Wells, Maine and Newton Corner, Massachusetts. 7/84 - 5/87. Coordinated and conducted wildlife research and management activities at Rachel Carson National Wildlife Refuge. Prepared environmental assessments, refuge master plans, monthly and annual wildlife use reports, and reviewed state wetlands alteration permits. Provided land use guidance to local towns and organizations in southern Maine. Prepared refuge Master Plan for Monomoy National Wildlife Refuge. Represented the US Fish and Wildlife Service at public hearings.

U.S. Fish and Wildlife Service: Refuge Manager, Chatham, Massachusetts. 4/83 -9/83 and 3/84 -7/84. Coordinated and conducted wildlife research and management activities at Monomoy National Wildlife Refuge. Performed extensive inventories of breeding birds, migratory birds and mammals, non-migratory mammals, plants, reptiles and amphibians. Prepared monthly and annual wildlife use reports.

Canadian Wildlife Service: Biological Technician, Sackville, New Brunswick. 9/81 - 11/81 and 7/82 - 11/82. Conducted waterfowl banding activities throughout the Maritime Provinces using an airboat. Set up and operated waterfowl trapping and banding operations in remote areas. Responsible for collecting detailed field notes and for preparing complete banding schedules and reports. Assisted in Atlantic Salmon tagging operations.

U.S. Fish and Wildlife Service: Biological Technician, Calais, Maine. 5/80 - 9/80 and 5/81 - 9/81. Conducted research on American Woodcock ecology at Moosehorn National Wildlife Refuge. Surveyed freshwater wetlands for breeding waterfowl. Responsible for collecting accurate data, analyzing data, and report writing.

University of Maine at Orono, Entomology Department: Laboratory Aid II, Orono, ME. 5/79 -5/80 and 9/80 - 5/81. Assisted in aquatic invertebrate ecological research. Collected and analyzed drift, grab, and substrate samples. Identified and sorted aquatic invertebrates.

Education

Bachelor of Science in Wildlife Management, May 1981, University of Maine at Orono.

Certification

Certified Wildlife Biologist, The Wildlife Society, Washington, D.C.

Committees

Maine Environmental Priorities Project, 1994
Ecological Work Group, 1994

Maine Natural Heritage Program Botanical Advisory Group, 1990 - present

University of Maine, College of Forest Resources Forest Resources Advisory Committee
Wildlife Subcommittee, 1990 - present

Maine Association of Wetland Scientists
President, 1994
Legislative Committee, Chair 1991 & 1992

The Wildlife Society, Maine Chapter
Secretary/Treasurer, 1989 & 1990
Wetlands Committee, 1989 - present

Bureau of Public Lands
Nahmakanta Management Unit Advisory Committee, 1993 - present

Wells National Estuarine Research Reserve
Research Committee, 1986 - 1993; ad-hoc advisor 1994

Training

40-Hour Safety Training Course for Hazardous Waste Operations in Compliance with OSHA 29 CFR 1910.120. September 1993.

Publications

Royte, J.L., D.D. Sperduto, and **J.P. Lortie**. In Press. A botanical reconnaissance and natural community survey of Nancy Brook Research Natural Area, White Mountain National Forest, Grafton County, New Hampshire. U.S. Forest Service, Northeast Forest Experiment Station.

Lortie, J. P., J. L. Royte, S. C. Rooney, and J. S. McMahon. 1993. Landscape Analysis and Inventory of the Nahmakanta Management Unit. Maine State Planning Office, Augusta, Maine.

Lortie, J. P. 1992. Wetland regulations affecting land use. Included in Government Regulations Seminar, State of Maine Chapter of the Appraisal Institute, Gorham, Maine.

Lortie, J. P. 1992. Wetlands identification and delineation. Pages 1-16 in Wetland and Shoreland Zoning Laws Affecting the Use of Real Estate. Maine State Bar Association. 235 pp.

Lortie, J. P., B. A. Sorrie, and D. W. Holt. 1991. Flora of the Monomoy Islands, Massachusetts. Rhodora 93(876): 361-389.

Lortie, J. P., R.C. Humphrey, and D.W. Holt. 1990. Gull control methods used on Monomoy National Wildlife Refuge, Massachusetts, 1980-1984. Abstracts, 46th Annual Northeast Fish and Wildl. Conf.

Lortie, J. P. and D. O. Parkin. 1988. An evaluation of scenic quality on lakes in Maine's organized towns. Maine State Planning Office, Critical Areas Program, Augusta, Maine.

Parkin, D.O., **J. P. Lortie**, R.C. Humphrey, and F.J. DiBello. 1988. The Maine Lakes Study, A Statewide Inventory of Maine Lakes. Maine State Planning Office, Critical Areas Program, Augusta, Maine.

Parkin. D. O. and **J. P. Lortie**. 1988. Lake Beaches in Maine's Organized Towns. Maine State Planning Office, Critical Areas Program, Augusta, Maine.

Parkin, D.O. and **J. P. Lortie**. 1988. The Maine Lakes Study, A Statewide Inventory of Maine Lakes, Work Plan. Maine State Planning Office, Critical Areas Program, Augusta, Maine.

Jones, J.J., **J.P. Lortie**, and U.D. Pierce. 1988. The identification and management of significant fish and wildlife resources in southern coastal Maine. Maine Department of Inland Fisheries and Wildlife, Augusta, Maine.

Lortie, J.P. and S.K. Pelletier. 1987. Distribution and abundance of breeding birds and small mammals in the high salt marsh and adjacent upland critical edge in southern Maine, 1986. Included in Proceedings of the Maine Biological and Medical Science Symposium, abstract only, Bowdoin College, Brunswick, Maine.

Holt, D.W., R.C. Humphrey, and **J.P. Lortie**. 1987. The mammals of Monomoy National Wildlife Refuge. The Cape Naturalist 15(4): 63-69.

Holt, D.W., **J.P. Lortie**, B.J. Nikula, and R.C. Humphrey. 1986. First record of Common Black-headed Gulls breeding in the United States. American Birds 40(2): 204-206.

Lortie, J.P., D.W. Holt, and R.C. Humphrey. 1985. Evaluation of gull control methods used on Monomoy National Wildlife Refuge, Massachusetts, 1980-1984. USFWS Refuge Manage. Study.

Holt, D.W., **J.P. Lortie**, and R.C. Humphrey. 1985. An inventory of breeding birds of Monomoy National Wildlife Refuge, Chatham, Massachusetts, 1984. Bird Observer of Eastern Massachusetts 13(4): 193-195.

PLANNING REPORT #37-94

MAINE NARROW GAUGE RAILROAD COMPANY
TRACKAGE DEVELOPMENT

VICINITY OF INDIA STREET, FORE STREET AND EASTERN PROMENADE

MAINE NARROW GAUGE RAILROAD COMPANY AND MUSEUM, APPLICANT

Submitted to the:

Portland Planning Board
Portland, Maine

July 26, 1994

I. INTRODUCTION

The Maine Narrow Gauge Railroad requests an amendment to their site plan which was approved by the Planning Board on June 28, 1994. The applicant requests that the plan be amended by removing a Planning Board condition of site plan approval relating to the length of the railroad ties (see Attachment A).

A memo from Natalie Burns, Associate Corporation Counsel, indicates that the proposed revision should be reviewed as an amendment to the site plan (see Attachment B). A copy of the Planning Board site plan approval letter is shown as Attachment C. If Board members do not have Planning Board Report (#30-94) covering the original site plan, copies will be available at Tuesday's meeting.

520 notices were sent to area property owners.

II. FINDINGS

The applicant requests a revision to the approved site plan so that eight foot ties (actually 8'-6") may be installed. In a letter dated 7-12-94, Stephen Mohr (project consultant) states, "follow-up discussions with MDOT subsequent to the Planning Board meeting have confirmed what was represented by me to the Board; MDOT wants to keep the ties at the 8'-6" length specified on the lease."

No other revisions to the site plan or condition of approval are being sought.

At the July 15th Eastern Prom Trail Advisory Committee meeting (see Attachment D), the Committee voted on the following resolution:

> "In the spirit of the cooperation between the Maine Department of Transportation and the City of Portland which has made possible the acquistion of the Eastern Promenade Corridor we encourage the Portland Planning Board to approve the 8'-6" tie length for the temporary installation of the Maine Narrow Gauge Railroad."

The Board decision to require a narrow gauge standard was influenced in part by the comments of a MDOT representative Allen Bartlett, Acting Director of the Rail Transportation Division. For the record, staff has reviewed the tape recording of the public hearing and has transcribed the following exchange between Mr. DeCourcey and Mr. Bartlett.

Mr. DeCourcey: "Mr. Bartlett, if in the spirit of compromise the City through the Planning Board conveyed its wish that they would prefer a shorter tie, my question to you would be, how realistic number one, is the usage by the State for regular rails in the very near future? And when I say very near future, 15 to 20 years. That's my first part of the question.

"The second part, realistically speaking, if the City was to utilize that surface, I don't think they would go it alone as far as funding and in fact if you were asking the federal government for assistance, wouldn't they in reality enforce their own standards and what we are quibbling about, is it not a moot question?

"My concern is that neighbors have a problem. There is a sincere effort for a trail to accommodate outdoor recreation. We as a Planning board are looking at a possible irritant. Mr. Carroll is conveying a feeling that a shorter tie, looking at it realistically in the very near future and probably for 15 to 20 years down the road, that this will be a compromise to meet both ends in the spirit that so many people have mentioned tonight. We all have our vested interest and I guess from my point of view, I'm looking at the amendments, I'm looking at what Mr. Cole presented.

"We are here at 10 minutes to 12. I sincerely want to reach some sort of compromise and I'm asking you if the municipality through the Planning Board made a strong case for the very near future, up to 15 to 20 years, would you think there is a possibility of meeting that compromise, by a shorter tie?"

Allen Bartlett: "I am sure that we could come to a compromise, yes. As far as your first question which spoke to the possibility of standard gauge rail being in operation in the next 20 to 25 years I do not have a crystal ball. I think that question might more appropriately be addressed to the City itself and its perception of commercial development down along the waterfront.

NOTE: Immediately following Mr. Bartlett's statement, the Planning Board voted on an amendment to include as a condition of approval specifying a rail tie length of five feet.

We have attached a letter dated June 27, 1994 from Allen Bartlett to Nathan Smith regarding a variety of rail/trail issues (see Attachment E). This letter was not addressed to the Planning Board nor Planning staff so that we did not have a copy of this letter as part of the written correspondence for the public hearing. Mr. Bartlett was at the public hearing and did offer comments during the public hearing that touches on several points contained in the letter.

III. MOTIONS FOR THE BOARD TO CONSIDER

On the basis of plans and materials submitted by the applicant and on the basis of information contained in #37-94 and #30-94 relevant to the standards for site plan review [and/or other findings as follows:]

1. That the revised plan featuring 8'-6" railroad ties is in conformance with the Site Plan standards of the Land Use Code.

ATTACHMENTS:

A. Amendment request by Maine Narrow Gauge Railroad
B. Memo from Natalie Burns, Associate Corporation Counsel
C. Planning Board Site Plan Approval Letter
D. Letter from Eastern Prom Trail Advisory Committee
E. Letter from MDOT, dated 6/27/94

ATTACHMENT A

MOHR & SEREDIN

Landscape Architects, Inc.

July 12, 1994

Mr. Joseph Gray, Director
City of Portland Planning Department
City Hall
389 Congress Street
Portland, ME 04101

Re: Maine Narrow Gauge Railroad
Condition of Approval Regarding Railroad Tie Length

Dear Mr. Gray,

On behalf of our client, Maine Narrow Gauge Railroad, we submit this request for a public hearing for the Planning Board to consider a request to remove the condition of approval requiring a railroad tie length of five feet. At the Planning Board Meeting on June 28, the Planning Board approved the site plan for MNGRR with several conditions, one of which required that the railroad bed design with "8 foot" ties be changed so that "five foot" ties would be used in the construction of the railroad.

As I explained to the Planning Board at the public hearing, this created a difficulty for MNGRR in that their lease with MDOT stipulates that "8 foot" ties shall be used by MNGRR in the construction of the railroad tracks. Follow up discussions with MDOT subsequent to the Planning Board meeting have confirmed what was represented by me to the Board; MDOT wants to keep the ties at the 8'-6" length specified on the lease.

MNGRR cannot proceed with the project as currently conditioned and we request that the Planning Board remove only the condition requiring "five foot" railroad ties at a public hearing on July 25. Please call if you have any questions.

Sincerely,

Stephen B. Mohr, ASLA

SBM/sd

cc: MNGRR Trustees
252\josgray

18 Pleasant Street, Portland, Maine 04101
(207) 871-0003

ATTACHMENT B

CITY OF PORTLAND, MAINE
M E M O R A N D U M

TO: Chair O'Brien and Members of the Planning Board

FROM: Natalie L. Burns, Associate Corporation Counsel

DATE: July 18, 1994

RE: **Maine Narrow Gauge Railroad Application**

On July 26 the Board will have before it an application to remove the condition of approval concerning the required maximum length of rail ties. This condition was part of the original approval for the Maine Narrow Gauge, so this application represents a modification to the previously approved site plan. This application is limited exclusively to that condition. As a result, the Board's review is also limited to the issue of the length of the ties. This condition will be reviewed under the applicable standards of §14-526. Public comment should also be limited to this condition, since there is no other matter before the Board at this time.

Natalie L. Burns
Natalie L. Burns
Associate Corporation Counsel

NLB:lab

ATTACHMENT C-1

CITY OF PORTLAND, MAINE

PLANNING BOARD

Jadine R. O'Brien, Chair
Kenneth M. Cole III, Vice Chair
Joseph R. DeCourcey
Irving Fisher
Cyrus Hagge
John H. Carroll
Donna Williams

June 29, 1994

Mr. Phineas Sprague
Maine Narrow Gauge Railroad Company
58 Fore Street
Portland, ME 04101

Dear Mr. Sprague:

On June 28, 1994, The Portland Planning Board voted 6-1 (Williams) on the following motions regarding temporary trackage proposed by the Maine Narrow Gauge Railroad from India Street to Fish Point.

1. That the plan is in conformance with the Site Plan Standards of the Land Use Code.

   i. In light of the temporary and demonstration nature of this proposal, use of the temporary railroad tracks shall be terminated by December 31, 1994. A revised site plan shall be submitted by the applicant for review and approval by the Planning Board reflecting the recommendations of the Eastern Prom trail master plan which said plan shall be subject to full site plan review.

   ii. That the submissions relating to stormwater management be revised and subject to staff review and approval.

   iii. That an executed agreement with MDOT shall be submitted covering operations of the Maine Narrow Gauge Railroad Company and lease of corridor for rail use.

   iv. That noise measurements relating to the train including whistles, bells and back-up signals, shall be reviewed by staff for conformance with the noise standards of the zoning ordinance.

   v. That the temporary trackage shall have railroad tie lengths no longer than a narrow gauge standard (five feet) and the ties shall be installed flush with the top of the ballast.

   vi. That the applicant shall be responsible for the cost of all rail crossings; safety barriers and other safety measures; buffers, other amenities and improvements adjacent to the trail; related to appropriate mitigation of the train use.

   vii. That the interior walkway system shall be revised for staff review and approval.

ATTACHMENT D

EASTERN PROMENADE TRAIL ADVISORY COMMITTEE

July 21, 1994

Portland Planning Board
c/o Jadine O'Brien, Chairman
City Hall
389 Congress Street
Portland ME 04101

Re: Maine Narrow Gauge Railroad

Dear Members of the Planning Board:

I am writing to you on behalf of the Eastern Promenade Trail Advisory Committee in connection with the application by the Maine Narrow Gauge Railroad for an amendment to its Site Plan approval which it received on June 28, 1994. In the light of recent developments and after discussion at its meeting on July 15, the Eastern Promenade Trail Advisory Committee adopted the following resolution:

> In the spirit of the cooperation between the Maine Department of Transportation and the City of Portland which has made possible the acquisition of the Eastern Promenade Corridor we encourage the Portland Planning Board to approve the 8'6" tie length for the temporary installation of the Maine Narrow Gauge Railroad.

Thank you for your consideration.

Very truly yours,

Nathan H. Smith
Co-Chair, Eastern Promenade Trail
Advisory Committee

cc George Campbell, Co-Chair
Committee Members
Allan Bartlett, Maine Department
of Transportation
Joseph Gray

240.NHS
22306001.721

ATTACHMENT E-1

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
TRANSPORTATION BUILDING
STATE HOUSE STATION 16 AUGUSTA, MAINE 04333-0016

DANA F. CONNORS
Commissioner

June 27, 1994

Mr. Nathan H. Smith
Co-Chair, Eastern Promenade
Trail Advisory Committee
Bernstein, Shur, Sawyer & Nelson
100 Middle Street
Portland, Maine 04104-5029

Re: Eastern Promenade, Portland, Maine

Dear Nathan:

Thank you for your letter dated June 22, 1994, following up on discussions held at the last Trail Committee meeting on Wednesday, June 15, 1994. Although we remain in disagreement regarding issues addressed in your letter, I appreciate the open dialog which we continue to maintain.

Placement of steel rails with a two foot gauge in a position off center on an 8'-6" tie is not an issue of safety. Properly constructed track will have a ballast surface level with the top of ties. Such a surface will be no different than a totally stone surface and will not encourage children to hop from tie to tie. If trail users are inclined to engage in such behavior, I find it implausible that an 8'-6" tie would be any more inviting that a 5' tie. Certainly a more likely action will be "tight-rope" walking along the top of the rail -- action that cannot be discouraged by any length of tie.

Neither do we view two foot gauge rails placed off center on 8'-6" ties as aesthetically displeasing. Again, I point to typical construction of track having a ballast surface level with the top of ties. Trail users who stay on the trail will see a flat surface from edge of ballast to edge of ballast, irregardless of the length of ties, and will only see the off center rails if they are too close to the tracks.

Eliza Cope's suggestion is totally unacceptable from an engineering standpoint. Her suggestion would require undercutting the existing ground and building the track structure in a "bathtub". That bathtub would collect water that would have no dispersal route, that would undermine the structural integrity of the track, that would lead to excessive tie rot, and that would cause frost heaves and significant track rehabilitation efforts annually.

By way of bringing Eliza's suggestion into your own bailiwick: would Portland Trails entertain digging a ten foot wide trench around the Prom and then paving the bottom of the trench for a bicycle/walking path?

Your desire regarding cooperation and the spirit of partnership between the Department, City and Portland Trails remain those of the Department also. However, that partnership can only remain open if all parties remember the charges under which each operates and the mutual understandings reached when the Trust for Public Land entered into negotiations with Canadian National on behalf of the Department. Our charge is to preserve rail corridors for future rail transportation use -- a charge which all parties involved in the CN corridor have been aware of since day 1.

Commissioner Connors, Deputy Commissioner Spinney and I remain committed to the creation of a dual use corridor along the Eastern Prom. We have not interfered with, and in fact applaud, the Portland Planning Board's review of the Museum's application for temporary operations. We only ask that all interested parties remember that the 26 foot rail corridor is inviolable and that the Department will retain that corridor in an unimpeded condition.

In response to the six requests noted in your letter of June 22nd, please accept the following:

1. The Lease and Operating Agreement with Maine Narrow Gauge Museum will incorporate any requirements imposed by the Portland Planning Board unless those requirements are unsound from an operations or engineering perspective. Should the Board be considering such provisions, I hope to voice Department concerns at the public hearing scheduled on June 28, 1994.

2. 8'-6" ties will remain a requirement for track construction and undercutting existing ground before track placement will not be allowed.

E-3

3. The Lease and Operating Agreement will not speak to barriers and fences -- that will be left to Trail Committee decisions, except crossings for automotive traffic.

4. The draft Lease and Operating Agreement has a terminating point at the west end of the treatle. A change in that point will require agreement from Maine Narrow Gauge Museum.

5. Railroad industry and Department policy require any crossing over a set of railroad tracks be installed and maintained at the expense of the entity requesting the crossing. We see no reason to treat the narrow gauge operation differently.

6. The Lease and Operating Agreement will not be subject to the City Easement. The City Easement will not be subject to the Lease and Operating Agreement.

I hope that this response has helped clear the air and that the Committee can move forward in creating a corridor that will have value and provide pleasure to all citizens of Portland and its many visitors.

Sincerely,

MAINE DEPARTMENT OF TRANSPORTATION
Bureau of Transportation Services

Allan

Allan H. Bartlett
Acting Director
Rail Transportation Division

cc: Phineas Sprague

PLANNING REPORT #36-93

PORTLAND COMPANY COMPLEX
BUILDING #6, 58 FORE STREET

RAILROAD MUSEUM
CHANGE-OF-USE SITE PLAN

NARROW GAUGE RAILROAD CO. & MUSEUM, APPLICANT

Submitted to:

Portland Planning Board
Portland, Maine

November 9, 1993

I. INTRODUCTION

The Narrow Gauge Railroad Company and Museum requests site plan review for a change in use of 8,000 sq. ft. of floor space within Building #6 at the Portland Company Complex (58 Fore Street). See Attachments A1-A5, for background information and proposed site plan. This proposal does not include the development of trackage along the former Canadian National Railway property. This will be reviewed at a later date when plans for the rail line have been developed. As a condition of approval, staff is recommending that any expansion of the museum use or the development of any trackage, shall require additional site plan approval.

There is no property "master plan" at this time. The owner has no plans to expand the existing buildings, change any uses or add new principal structures. The owner plans to continue to lease space within the site to tenants whose use conforms with the current zoning, and to operate Portland Yacht Services as the principal use at the property.

530 notices were sent to area property owners.

II. FINDINGS

Zoning:	Waterfront Special Use Zone
Land Area:	Entire site is 8.91 acres (160,000 sq. ft.)
Building Floor Area:	8,000 sq. ft.
Proposed Parking Spaces:	19 parking spaces, 2 handicap spaces
Zoning Parking Space Requirement:	20 spaces (1 per 400 sq. ft.)

III. PROPOSED DEVELOPMENT

Building #6 (see site plan) is located in the middle of the Portland Company's complex of brick buildings. Approximately 5,000 sq. ft. of the 8,000 sq. ft. building will be used to house locomotives and railway cars with the remaining space used for exhibits, information, store, reception area and offices. The applicant proposes to lay approximately 2,300 lineal feet of narrow gauge track on the existing gravel lot in the rear of the site to provide outdoor storage for the train cars. A wooden, arched truss locomotive shed of 16' x 16' x 100' dimension has been placed in this gravel area as an engine shed. (See Attachment B1-B2).

The zoning requirement for the museum building is calculated at 20 spaces. The 20 spaces for museum parking will be striped on existing black top.

Exclusive of the storage area for railroad cars, 270 parking spaces are shown on the site plan (see Attachment A-5). Most of the spaces shown on the plan are on existing black top. A small number of spaces would be on an existing gravel base.

Following is the breakdown of the complex's occupied building areas and the parking requirements as submitted by Steve Mohr (Attachment D-2):

There is a total of 160,000 sq. ft. on the site's 8.91 acres. Of this building area, 35,000 sq. ft. is vacant, Portland Yacht Services occupies 78,000 sq. ft. and six other tenants are located in the balance of the buildings (47,000 sq. ft.). The principal tenant is Cornerstones, with the others being marine-related service businesses. Counts of vehicles on-site over a 5-day period showed between 58 and 65 cars on-site during the morning and late afternoon. Using the current municipal off-street parking requirements, the existing 113,000 sq. ft. of space in use would require a total parking count of 95 parking spaces. (Attachment A-4).

These numbers will be verified by William Giroux, Zoning Administrator, prior to November 9th, but there appears to be ample parking for building areas in use.

Vehicular access to the site is from the existing Portland Company driveway on Fore Street. No other driveways are proposed on Fore Street.

IV. STAFF REVIEW

The proposed change-of-use site plan development has been reviewed by staff for conformance with the Review Standards of the Site Plan and Shoreland Regulations.

A. SITE PLAN

1/2. TRAFFIC

The driveway is the existing Fore Street entrance to the Portland Company Complex.

Curbs and sidewalks exist along the applicants street frontage of the entire site.

Nineteen parking spaces are located along the front (south side) of the Museum, Building #6. Two designated handicapped parking spaces on the south side of Building #2.

The existing vehicular circulation pattern will be reinforced by the placement of "one way" and "do not enter" signs on Building #6. The vehicular traffic between Building #6 and #7 will be restricted to one way traffic flowing from the rear of the lot to the front of the site.

A defined pedestrian access route has been shown on the plan to provide access from the building to the exterior train tracks and new shed. The walkway layout follows existing tracks on the property. It is proposed as a four foot wide, striped walkway which will cross parking area, follow the existing edge of a storage area and terminate at the locomotive shed. A crosswalk is also proposed at the west side of the building to connect the handicap parking to the Museum entrance.

3. BULK, LOCATION, HEIGHT OF BUILDING, USES REGARDING HEALTH AND SAFETY

The proposed development will not cause any known health or safety problems to existing uses in the neighborhood, including without limitation, health or safety problems resulting from any substantial reduction in light and air, any significant wind impact, and any significant snow loading on any neighboring structure.

4. BULK, LOCATION OR HEIGHT OF BUILDING DIMINUTION OF VALUE AND UTILITY

The proposed development involves reusing an existing building in the Portland Company Complex. The footprint of the building, 8,000 sq. ft. or 5% of the entire site.

No exterior changes are proposed to the museum building except that the wood boards covering the windows will be removed.

A wooden, arched truss locomotive shed of 16' x 16' x 100' dimension has been placed in the gravel area on the southeasterly edge of the property.

5. SEWER, WATER, SOLID WASTE DISPOSAL

The museum will be served by existing water, electricity and sewer lines. The change-in-use will not increase the demand for services, and all utilities are adequate to meet the needs of the Narrow Gauge Railroad Co. and Museum.

Solid waste from the museum will be handled in the same manner as the waste stream from the balance of the buildings. It will be collected in an existing on-site dumpster and hauled by a private contractor.

6. LANDSCAPING

Four (4) to six (6) birch trees (2 1/2 to 3" caliper) are proposed to be planted between buildings #6 and #7 on the border of the City/State right-of-way. Staff is recommending that the exact quantity, species, and locations of trees be determined in response to recommendations made by the consultants for the Eastern Promenade Trail Study.

7. PRESERVATION OF EXISTING VEGETATION

The site plan indicates that a number of trees along the southerly property line will be conserved. A large white birch tree on the south side of Building #5 will also be conserved.

On the far easterly end of the site adjacent to the Haley property, the site plan indicates that a fence will be relocated to the toe of the slope and that vegetation will be cleared. This will extend the storage area for the rail cars.

8. DRAINAGE, EROSION AND SEDIMENTATION

Storm drainage will be handled via existing catch basins and piping. The existing drainage patterns will not be affected by the proposed uses, as no new grading or disturbance to the soil is anticipated.

9. LIGHTING

No new lighting is shown on the plan although there are existing yard lights mounted on the building.

10. FIRE

The Fire Department has reviewed the plan for fire-related concerns and finds it acceptable.

11. INFRASTRUCTURE

The proposed Eastern Promenade Shoreway Trail right-of-way is adjacent to this property. Staff recommends that landscaping the complex's edge to the trail corridor should be determined by the Master Plan.

B. SHORELAND

A portion of the site is in a Shoreland Zone. The proposed development activities will be taking place on the outer perimeter of the Shoreland Zone, a significant distance from the shoreline.

1. PRINCIPAL AND ACCESSORY STRUCTURES

The locomotive shed (16' x 16' x 100') is set back 90' from the existing seawall.

2. PIERS

No piers are proposed.

3. CLEARING OF VEGETATION

No vegetation is proposed to be cleared within 75 feet of the water.

4. EROSION AND SEDIMENTATION

This proposed new use and construction of these improvements will not result in significant soil disturbance and will not contribute to soil erosion or sedimentation problems.

5. SOILS

The proposal utilizes an existing developed site.

6. WATER QUALITY

The development is served by a public sewer. These improvements will not result in any direct detrimental impacts to water quality.

7. ARCHEOLOGICAL SITES

Development activities on the site will not disturb a site listed on or eligible to be on the National Register of Historic Places.

8. INSTALLATION OF PUBLIC SERVICES

There will be no new installation of public services.

9/10. ROADS, DRIVEWAYS AND PARKING AREAS

The proposal exceeds the shoreline setback standards of this section.

11. STORMWATER RUNOFF

Construction of the proposed improvements will not result in any significant increase in stormwater runoff.

12. AGRICULTURE

Not applicable.

13. GENERAL SITE PLAN FEATURES

a. The proposal will maintain safe and healthful conditions;

b. The proposal will not result in water pollution, erosion, or sedimentation to surface waters;

c. The proposal will adequately provide for the disposal of all wastewater;

d. The proposal will not have an adverse impact on spawning grounds, fish, aquatic life, bird or other wildlife habitat;

e. The proposal will conserve shore cover and visual, as well as actual, points of access to inland and coastal waters;

f. The proposal will protect archaeological and historic resources;

g. The proposal will not adversely affect existing commercial fishing or maritime activities;

h. The proposal will avoid problems associated with flood plain development and use; and

j. The proposal is in conformance with the standards set forth in this section.

C. WATERFRONT SPECIAL USE ZONE

The proposed change in use of 8,000 sq. ft. of Building #6, and the utilization of the existing outdoor yard at 58 Fore Street for the development of the Narrow Gauge Railroad Co. & Museum will not have an adverse impact on existing or future marine development opportunities.

1. The proposed activities do not displace an existing water-dependent use;

2. The proposed uses do not reduce existing commercial vessel berthing space;

3. The proposed facilities, activities and related parking and improvements will not interfere with the operations and activities of water-dependent uses, nor will they impede access to Casco Bay or vessel berthing. Existing access ways and gates from Portland Yacht Services to the piers have been maintained with the proposed plans;

4. The siting of the new museum facilities does not reduce or inhibit existing public access to marine or tidal waters. The proposed plans are intended to increase public access to the pedestrian path adjacent to Casco Bay.

V. MOTIONS FOR THE BOARD TO CONSIDER

On the basis of plans and materials submitted by the applicant and on the basis of information contained in Planning Report #36-93, the Board finds:

1. That the plan is in conformance with the Site Plan Ordinance of the Land Use Code.

Potential Conditions of Approval:

i. Condition proposed by staff recommends that exact numbers, locations, and species of trees along the southerly border adjacent to the proposed Shoreway Trail shall be determined in response to the recommendations made by the consultants of the Eastern Promenade Trail Master Plan Study.

ii. ~~Conditions proposed by staff that~~ any expansion of the museum use or the development of any trackage, shall require site plan approval. 7-6

2. That the plan is in conformance with the Shoreland Regulations and the Waterfront Special Use Zone of the Land Use Code.

ATTACHMENTS:

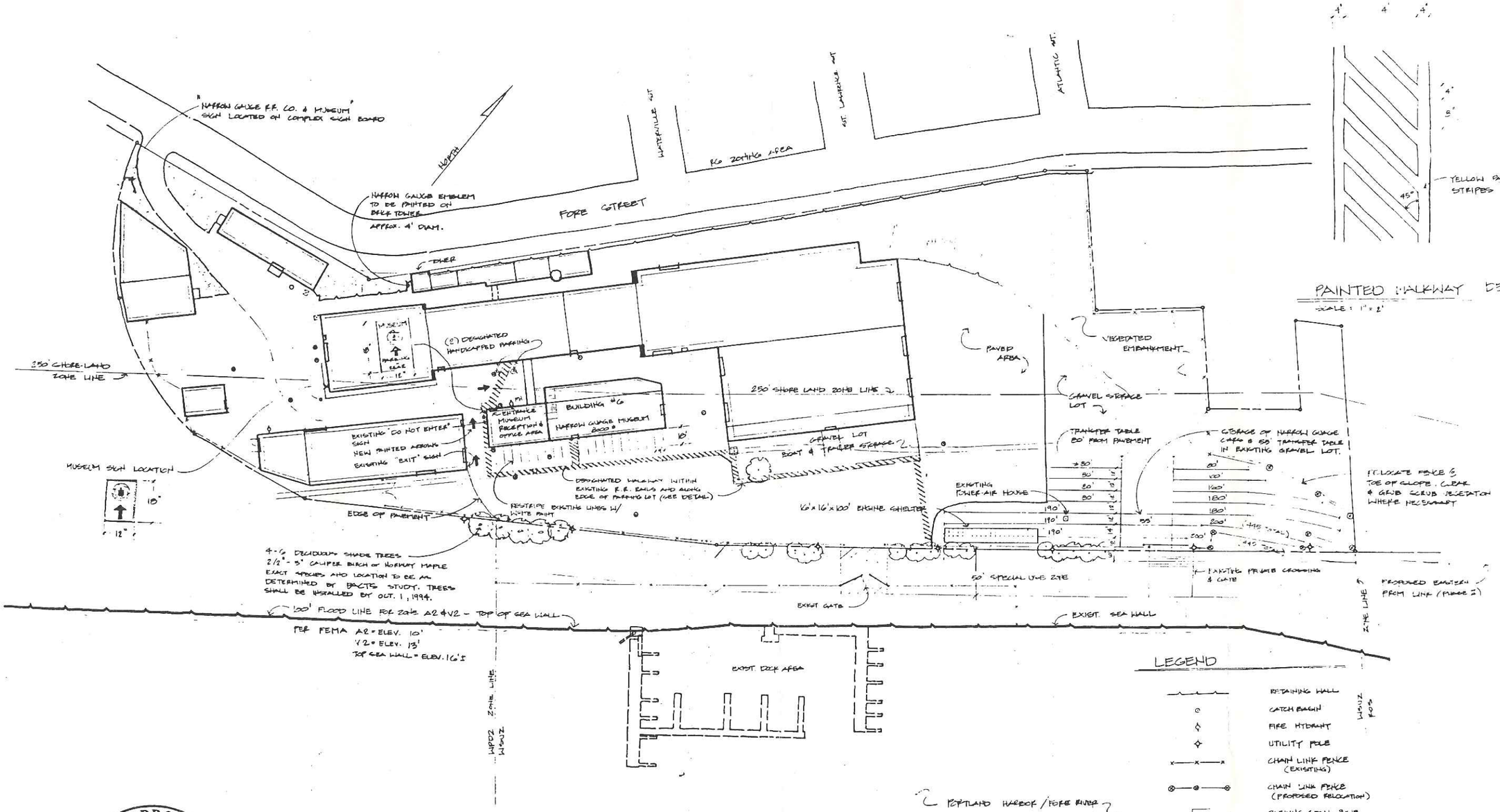
A-1 Revised Site Plan with Pedestrian Walkway
A-2 Portland Company Complex Survey
A-3 Building No. 6 - First Floor Plan
A-4 Parking Zones and Pedestrian Walk
A-5 Preliminary Site Plan with Parking Delineated
B-1 Shelter Elevation, End and Side Views
B-2 Photographs of Engine Shelter
C Logo to be incorporated in Signage
D-1 Mohr & Seredin Correspondence 9/13/93
D-2 Mohr & Seredin Correspondence 10/12/93
D-3 Mohr & Seredin Correspondence 11/03/93
D-4 Memo from Craig R. Carrigan, PE, Development Review Coordinator 11/03/93
E-1 Janette Chase Correspondence 10/28/93
E-2 Anita Leavitt Correspondence
E-3 Wallace Leavitt Correspondence 10/25/93
E-4 Michael Trueworthy Correspondence 09/29/93
E-5 John Wirtz Correspondence 10/15/93
E-6 Rodney & Melba Quinn Correspondence 09/01/93

III The siting of coal storage bin reviewed by Planning Staff and Public Works Dept.

IV Pedestrian corridor and walkway is consistent with Waterfront Regulations and will be reviewed within one year from now

7-0

ATTACHMENT A-1



MAINE NARROW GAUGE RAILROAD Co. & MUSEUM

MINOR SITE PLAN

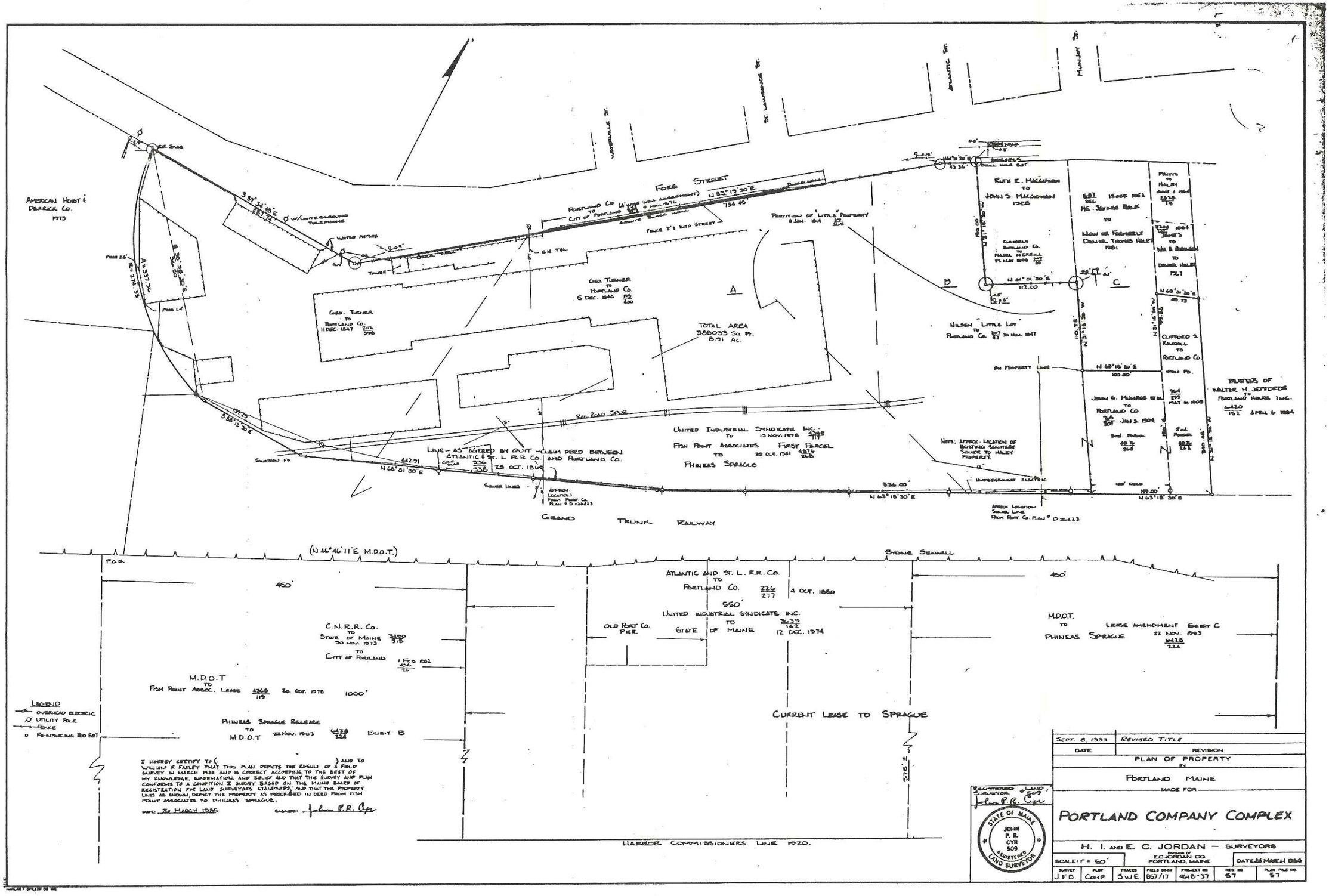
58 FORE STREET
PORTLAND, ME.

mohr & seredin, landscape architects

scale: 1" = 50'

date: 9 • 93

REVISIONS: 10-12-93 - SIGNAGE, WALKWAYS, PLANTINGS

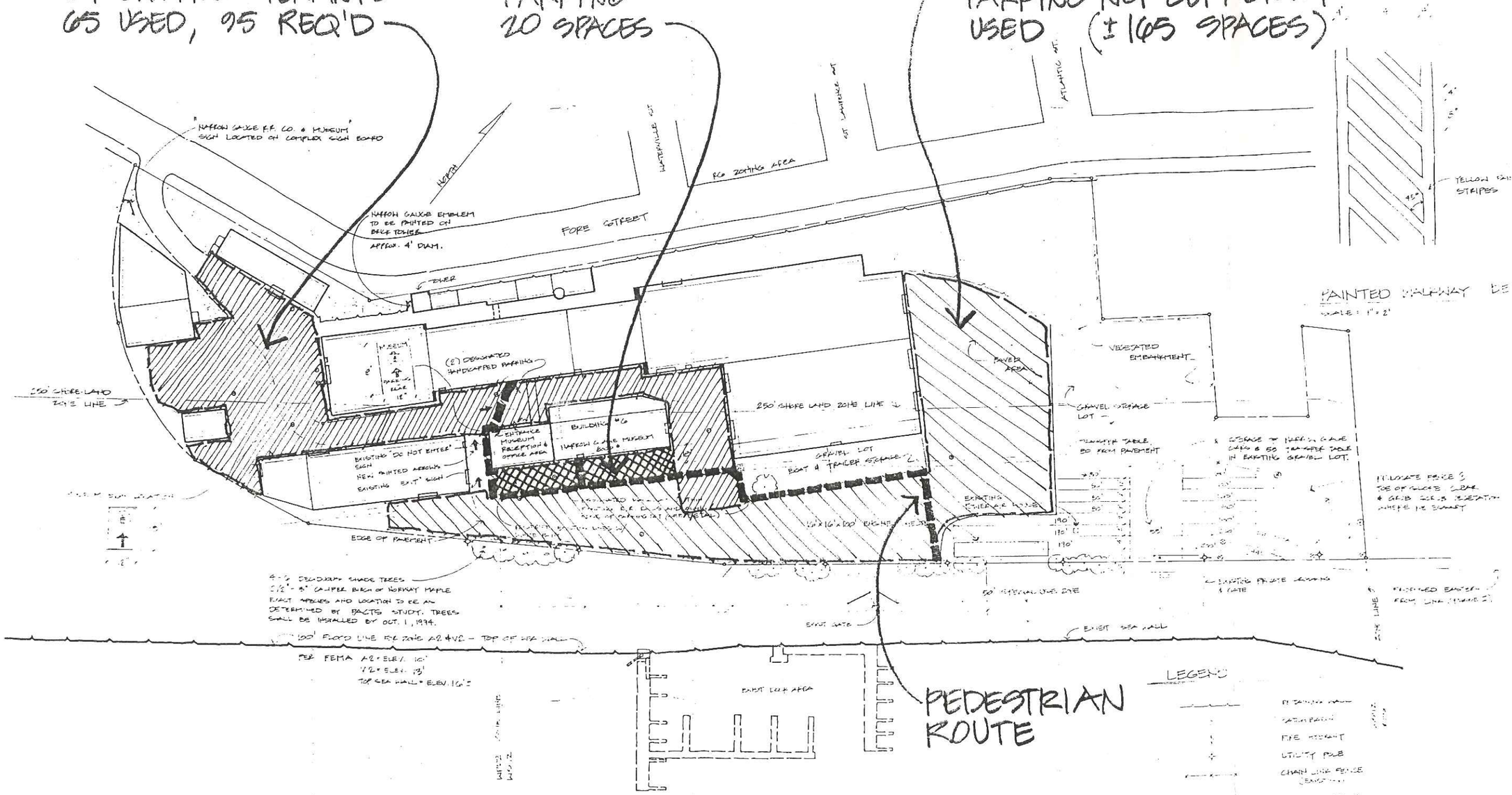

FORE STREET
WESTERN PROMENADE
ST. LAWRENCE ST.
ATLANTIC ST.
MARGINAL ST.
AMERICAN HOIST & DERRICK CO. 1973
Portland Co to City of Portland 4 Nov. 1874
N 63° 19' 30" E 734.45'
S 87° 34' 45" E 281.74'
WATER METERS
TOWER
G.W. TEL.
FALSE 8' INTO STREET
Position of "Little" Property 8 Jan. 1814
GEO. TURNER TO PORTLAND CO. 5 DEC. 1846
GEO. TURNER TO PORTLAND CO. 11 DEC. 1847
TOTAL AREA 388033 Sq. Ft. 8.91 Ac.
A
B
C
RUTH E. MACGOWAN TO JOHN S. MACGOWAN 1985
NELSON "LITTLE LOT" TO PORTLAND CO. 30 NOV. 1847
N 64° 01' 30" E 112.00
N 68° 18' 30" E 100.00'
ON PROPERTY LINE
CLIFFORD S. RANDALL TO PORTLAND CO.
TRUSTEES OF WALTER H. JEFFORDS TO PORTLAND HOUSE, INC. 6420 162 APRIL 6 1984
JOHN G. MUNROE ESTATE TO PORTLAND CO. JAN 3 1804
MAY 6 1909
1st Floor
2nd Floor
N 63° 18' 30" E 149.00'
RAIL ROAD SPUR
SALTERN'S POINT
S 38° 12' 30" E 197.75'
N 68° 31' 30" E 442.91'
LINE AS AGREED BY QUIT CLAIM DEED BETWEEN ATLANTIC & ST. L. R.R. CO. AND PORTLAND CO. 25 OCT. 1845
UNITED INDUSTRIAL SYNDICATE INC. TO FISH POINT ASSOCIATES FIRST PARCEL 20 OCT. 1981
PHINEAS SPRAGUE
NOTE: APPROX. LOCATION OF EXISTING SANITARY SEWER TO HALEY PROPERTY.
UNDERGROUND ELECTRIC
936.00'
N 63° 18' 30" E
APPROX. LOCATION SEWER LINE FROM PORT CO. PLAN # D-2423
APPROX. LOCATION OF PORTLAND CO. PLAN # D-2423
GRAND TRUNK RAILWAY
(N 44° 46' 11" E M.D.O.T.)
P.O.B.
STONE SEAWALL
450'
ATLANTIC AND ST. L. R.R. CO. TO PORTLAND CO. 226 277 4 OCT. 1850
550'
UNITED INDUSTRIAL SYNDICATE INC. TO STATE OF MAINE 2439 163 12 DEC. 1974
OLD PORT CO. PIER
C.N.R.R. CO. TO STATE OF MAINE 30 NOV. 1973 3420 318
TO CITY OF PORTLAND 1 FEB 1982 404 41
M.D.O.T. TO FISH POINT ASSOC. LEASE 4368 119 26 OCT. 1978 1000'
PHINEAS SPRAGUE RELEASE TO M.D.O.T 22 NOV. 1983 6428 224 EXHIBIT B
M.D.O.T. TO PHINEAS SPRAGUE LEASE AMENDMENT EXHIBIT C 22 NOV. 1983 6428 224
CURRENT LEASE TO SPRAGUE
575' ±
HARBOR COMMISSIONERS LINE 1920.
LEGEND
OVERHEAD ELECTRIC
UTILITY POLE
FENCE
REINFORCING ROD SET
I HEREBY CERTIFY TO ( ) AND TO WILLIAM E FARLEY THAT THIS PLAN DEPICTS THE RESULT OF A FIELD SURVEY IN MARCH 1985 AND IS CORRECT ACCORDING TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF AND THAT THIS SURVEY AND PLAN CONFORMS TO A CONDITION II SURVEY BASED ON THE MAINE BOARD OF REGISTRATION FOR LAND SURVEYORS STANDARDS, AND THAT THE PROPERTY LINES AS SHOWN, DEPICT THE PROPERTY AS PRESCRIBED IN DEED FROM FISH POINT ASSOCIATES TO PHINEAS SPRAGUE.
DATE: 26 MARCH 1985 SIGNED: John P.R. Cyr
REGISTERED LAND SURVEYOR John P.R. Cyr 509
STATE OF MAINE JOHN P. R. CYR 509 REGISTERED LAND SURVEYOR
SEPT. 8 1993 REVISED TITLE
DATE REVISION
PLAN OF PROPERTY IN PORTLAND MAINE
MADE FOR
PORTLAND COMPANY COMPLEX
H. I. and E. C. JORDAN – SURVEYORS
SCALE 1" = 50' DIVISION OF E.C. JORDAN CO. PORTLAND, MAINE DATE 26 MARCH 1985
SURVEY JFB PLOT COMP TRACED SWE FIELD BOOK 857/17 PROJECT NO 946-37 REC. NO 57 PLAN FILE NO 57

ATTACHMENT A-4

PARKING DEDICATED/USED BY EXISTING TENANTS 65 USED, 95 REQ'D

PROPOSED MUSEUM PARKING - 20 SPACES

ADDITIONAL / OVERFLOW PARKING NOT CURRENTLY USED (± 165 SPACES)



MAINE NARROW GAUGE RAILROAD Co. & MUSEUM

MINOR SITE PLAN

58 FORE STREET
PORTLAND, ME.

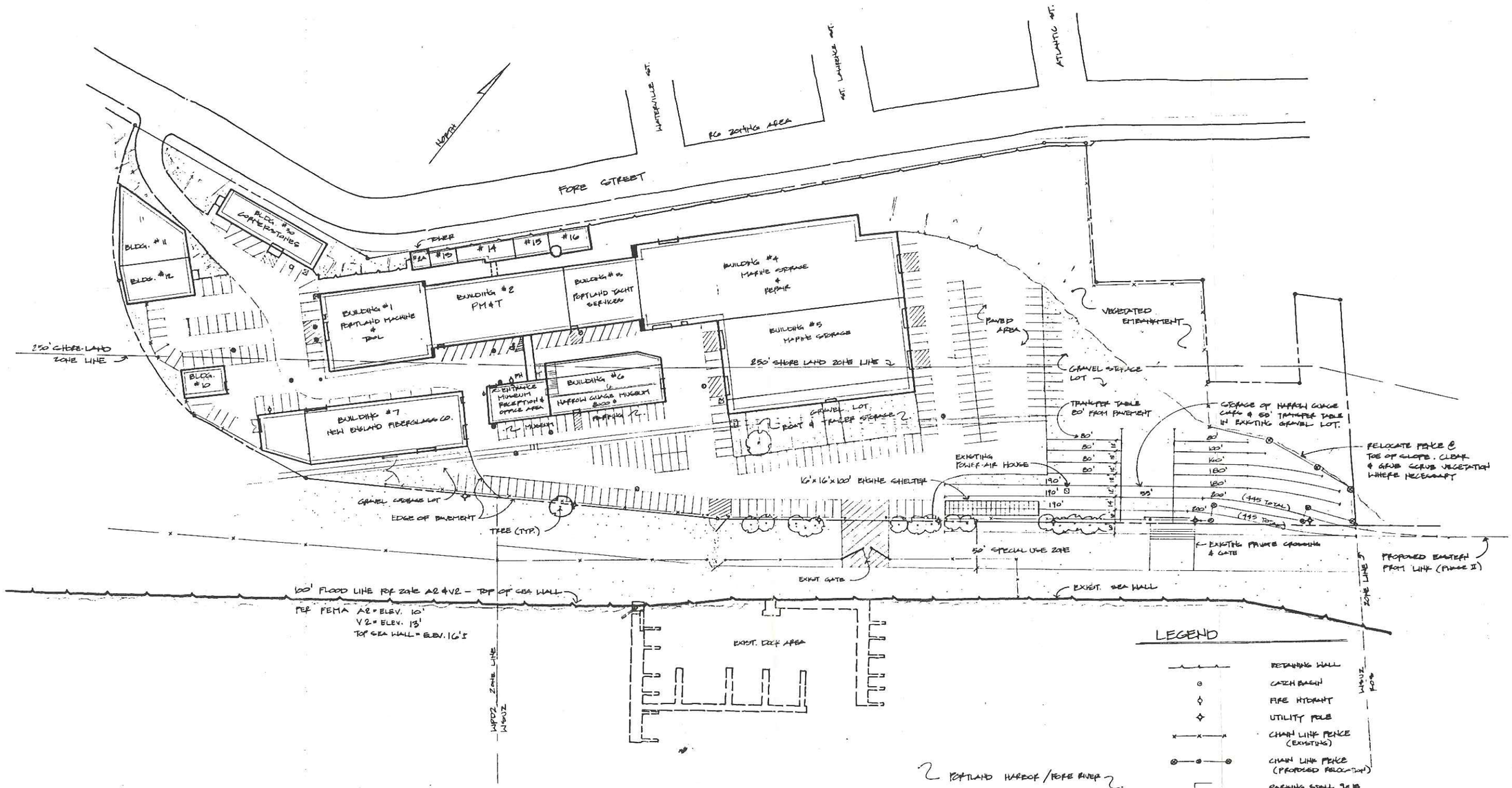
mahr & smedin, landscape architects

scale 1" = 50' (U.T.S.)

date: Feb 9 '95

REVISED: 10-12-95 - SHRUBS, WALKWAYS, PARKING

ATTACHMENT A-5



MAINE NARROW GAUGE RAILROAD Co. & MUSEUM

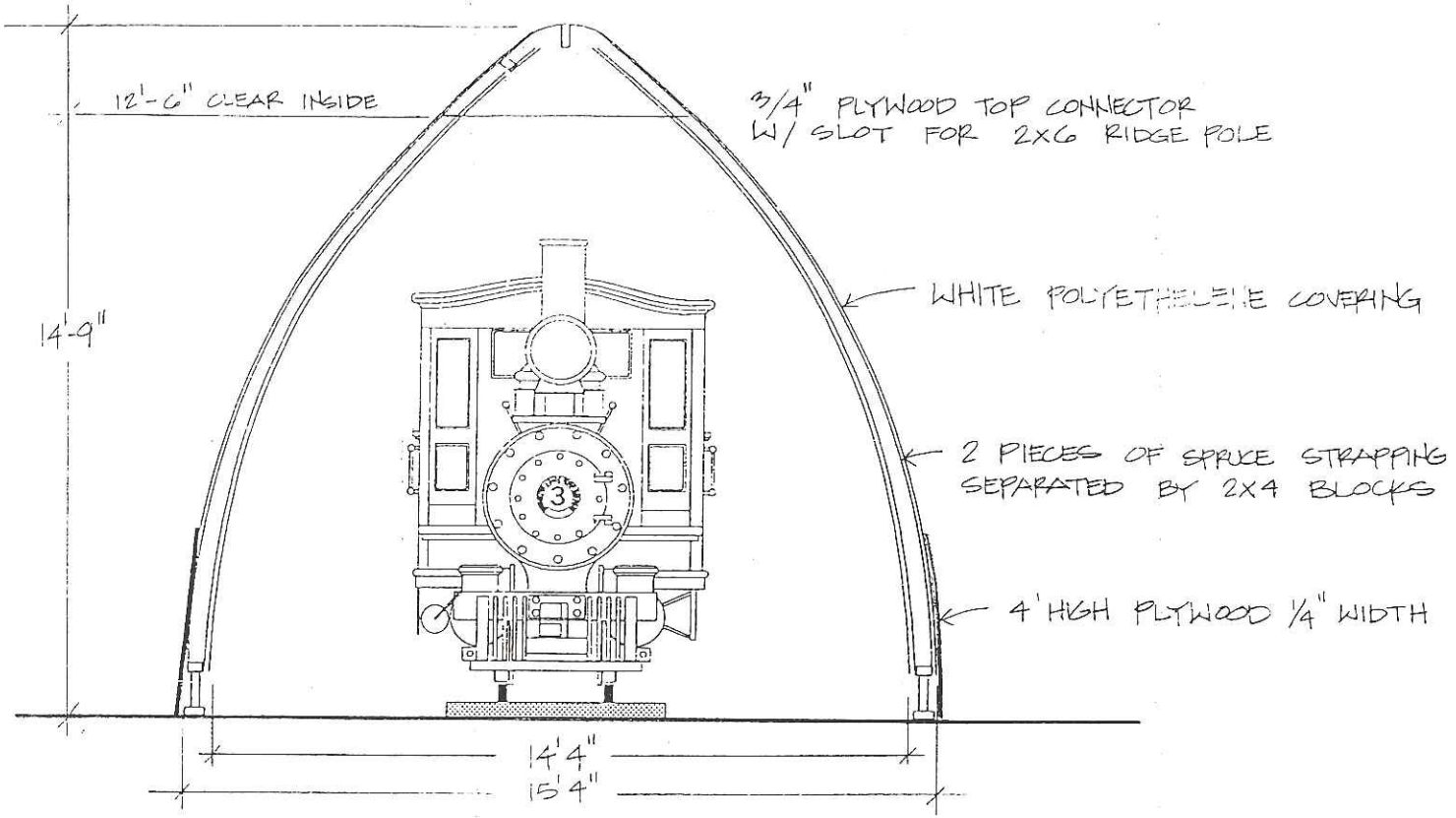
MINOR SITE PLAN

58 FORE STREET
PORTLAND, ME.

mohr & seredin, landscape architects

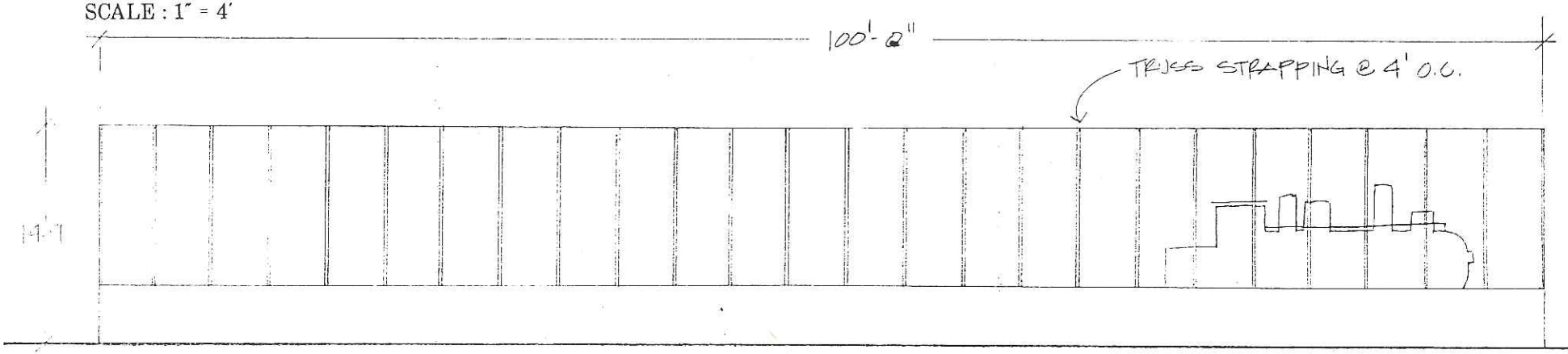
scale: 1" = 50'

date: 9 • 93



SHELTER ELEVATION - END VIEW

SCALE : 1" = 4'

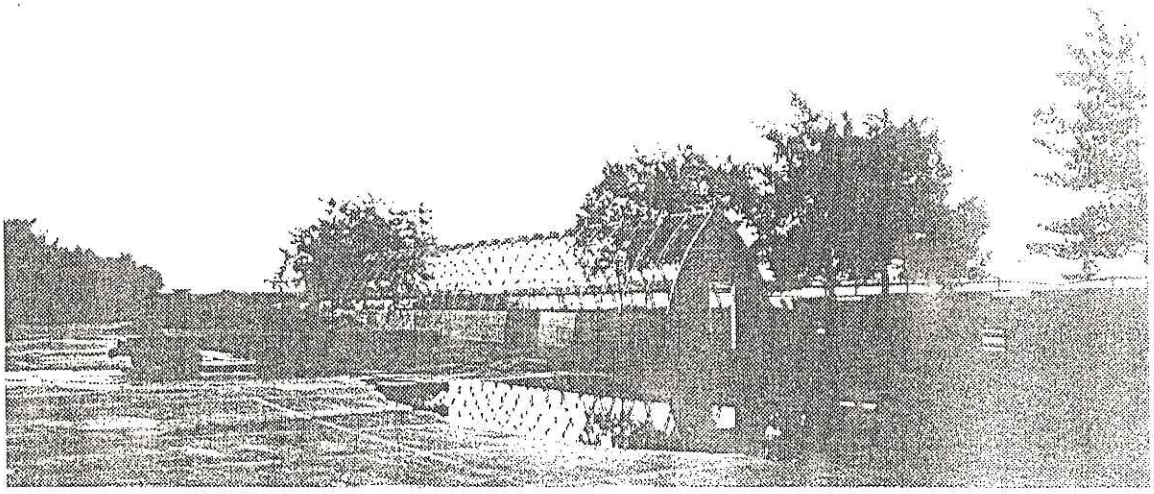


SHELTER ELEVATION - SIDE VIEW

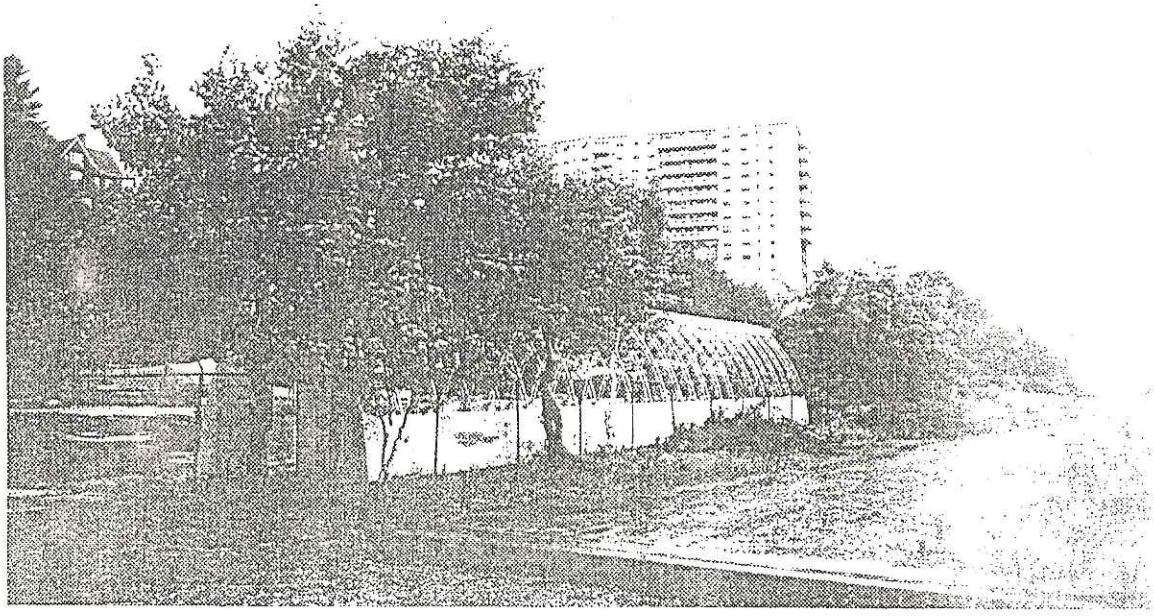
SCALE: 3/32" = 1'

ATTACHMENT B-1

ATTACHMENT B-2



ENGINE SHELTER LOOKING EAST



ENGINE SHELTER LOOKING NORTH

ATTACHMENT C

ATTACHMENT D-1

MOHR & SEREDIN

Landscape Architects, Inc.

September 13, 1993

Mr. Joseph Gray, Director
Portland Planning Department
389 Congress Street
Portland, ME 04101

Re: Narrow Gauge Railroad Co. & Museum Change in Use for Building 6
Minor Site Plan Review

Dear Joe,

On behalf of the Narrow Gauge Railroad Co. and Museum., we submit the attached seven copies of the site plans and supporting documentation for staff review of the plans for the change in use of 8,000 s.f. within Building 6 at the Portland Company. The Portland Co. property is located within the WSUZ Zoning District, and the museum site is partially located within the Shoreland Zone District. The plans have been prepared in conformance with the Land Use ordinances of the City of Portland, and for the most part reflect little change to the properties land use patterns or existing conditions at the site.

The site development is located within the Portland Co. complex at 58 Fore Street. The property is currently owned by Phineas Sprague, Sr. The applicant proposes to renovate the first floor of the existing Building #6 on the property for use as a museum. Approximately 5,000 s.f. of the 8,000 s.f. structure will be used to house some of the locomotives and cars and the remaining space will be used for Narrow Gauge artifacts and information, offices, reception area and the restroom. The applicant also proposes to lay approximately 2,300 lineal feet of narrow gauge track on the existing gravel lot in the rear of the site to provide outdoor storage for the train cars. A wooden, arched truss locomotive shed of 16' x 16' x 100' dimension is also to be placed in this gravel lot as an engine shed. All exterior work will occur within existing disturbed areas on the Portland Co. site.

The museum will be served by existing water, electricity and sewer lines. The change in use will not increase the demand for services and all utilities are adequate to meet the needs of the Narrow Gauge Railroad Co. and Museum. Storm drainage

18 Pleasant Street, Portland, Maine 04101
(207) 871-0003

will be handled via existing catch basins and piping. The existing drainage patterns will not be affected by the proposed uses, as no new grading or disturbance to the soil is anticipated. Existing parking spaces around the proposed museum are adequate to handle the required 20 spaces required to serve the museum, based on a parking ratio of one per 400 s.f..

No additional state or federal regulatory approvals are required for the plan as depicted on the attached drawings. It is our hope that the staff review can be expedited to allow for the scheduled move of the narrow gauge cars to the Portland Co. grounds on Sunday, September 19.

This submission includes the following:

1) Site Plan
2) Site Survey Plot Map
3) Museum Floor Plan

Respectfully submitted,

Stephen B. Mohr, ASLA

SBM/asm

Copies to: Phineas Sprague, Jr.
Narrow Gauge Railroad Co. and Museum, Board of Trustees

ATTACHMENT D-2

MOHR & SEREDIN

Landscape Architects, Inc.

October 12, 1993

Mr. Richard Knowland, Senior Planner
Portland Planning Department
City Hall
Congress Street
Portland, ME 04101

Re: Maine Narrow Gauge Railroad Co. & Museum Site Plan Submission

Dear Richard,

On behalf of the Maine Narrow Gauge Railroad Co. & Museum, we submit this information and attached plan in support of the Museum's application for site plan approval for the change in use at Building 6, 58 Fore Street. The previous submission presented the facts for the change in use of 8,000 s.f. of Building 6 to house the Museum office, store and exhibit area. The plans as presented to the Planning Board at the September 28 meeting have been revised as follows:

1. Pedestrian circulation: A defined pedestrian access route has been shown on the plan to provide access from the building to the exterior train tracks and new shed. This is proposed as a four foot wide, striped walkway which will cross the parking area, follow the existing edge of a storage area and terminate at the locomotive shed. A cross walk is also proposed at the west side of the building to connect the handicap parking to the Museum entrance.

2. Vehicular circulation: The existing vehicular circulation pattern will be reinforced by the placement of "one way" and "do not enter" signs on Building 6. The vehicular traffic between Building 6 and 7 will be restricted to one way traffic flowing from the rear of the lot to the front of the site.

3. Planting: As discussed with the Planning Board on the 28th, there are security, visibility, vehicular access and functional reasons for restricting the planting in the rear and site lots. After reviewing the buffering with City Arborist, the plans have been revised to show the planting of shade trees along the edge of the site near Building 7 where it borders the City/State right of way. Four (4) to six (6)

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new birch trees will be planted, subject to the recommendations of the PACT's study which will be performed this winter. The plantings will be installed in 1994, after the PACT's corridor study is completed and approved.

4. Signage: The Maine Narrow Gauge Railroad Co. & Museum proposes to use the existing logo to provide for signage at the site. A 4' diameter painted logo will be installed on the existing tower, and two small signs (12" x 18") will be placed interior to the site to direct traffic to the parking and museum entrance.

There is a total of 160,000 square feet on the sites 8.91 acres. Of this building area 35,000 square feet is vacant, Portland Yacht Services occupies 78,000 s.f. and six other tenants are located in the balance of the buildings (47,000 s.f.). The principal tenant is Cornerstones, with the others being marine related service businesses. Counts of vehicles on site over a 5 day period showed between 58 and 65 cars on-site during the morning and late afternoon. Using the current municipal off-street parking requirements, the existing 113,000 s.f. of space in use would require a total parking count of 95 parking spaces.

There is no property "master plan" at this time. The owner has no plans to expand the existing buildings, change any uses or add new principal structures. The owner plans to continue to lease space within the site to tenants whose use conforms with the current zoning, and to operate Portland Yacht Services as the principal use at the property.

This submission includes the following:

1. Revised site plan
2. Elevations and photos of the locomotive shed
3. Copy of logo to be used for signage
4. Shoreland Zoning Standard response

We trust this is adequate to meet needs of the Planning Department. We look forward to meeting with the Board on the 26th for the public hearing.

Sincerely,

Stephen B. Mohr, ASLA

cc: Phineas Sprague, Maine Narrow Gauge Railroad Co. & Museum

ATTACHMENT D-3

MOHR & SEREDIN

Landscape Architects, Inc.

November 3, 1993

Ms. Kay Wagenknecht-Harte, ARP, Planner
Planning Department
Portland City Hall
Portland, Maine

Re: Maine Narrow Gauge Railroad Co, & Museum Site Plan

Dear Kay:

Pursuant to our telephone conversation of November 1, I have assembled the additional information which you requested, and include it in this submission. The response to the waterfront standards is appended to this as a separate item, as are copies of the site plan. The responses to your specific questions are as follows:

1. Existing parking:

As noted in the previous submissions, actual on-site parking is occupying up to 65 spaces, and code requirements for the existing uses on the property require 95 spaces. These parking needs are currently being met in the south parking lot between buildings 1, 12, 10 and 30, and in the narrow parking strip between buildings 2 and 6. With the railroad tracks in place on-site, the total on-site parking is approximately 270 spaces. A note has been added to the plan stating this parking information.

2. Proposed parking:

The Maine Maritime Museum in Bath was designed and constructed with a parking of 1 space per 200 sf of display area. The Spring Point Museum in South Portland is designed with a parking ratio of 1 space per 150 sf of exhibit floor area. The proposed parking ratio for the Narrow Gauge Railroad is 1 space per 400 sf of gross floor area, or 1 space per 200 sf of exhibit and museum store area. This is consistent with the projects mentioned above and reflects what the city traffic engineer has agreed is an appropriate number of parking spaces for average daily use of the facility as currently configured.

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3. Pedestrian circulation:

The pedestrian access route proposed to connect the museum building with the track and car storage/display area is located to provide safe circulation through the parking areas on-site. The walkway layout follows existing tracks on the property, crosses perpendicular to the vehicular travel lane north of Building 6, runs along the existing gravel storage lot and the crosses the travel lane to the overflow parking lot to reach the engine shelter building. This keeps the walkway away from the parking area, and separated from the vehicular traffic for the majority of the route.

4. Solid Waste:

Solid waste from the museum will be handled in the same manner as the waste stream from the balance of the buildings; collected in an existing on-site dumpster and hauled by a private contractor.

Please call if you have any questions.

Sincerely,

Stephen B. Mohr, ASLA

cc Phineas Sprague, MNGRCo & Museum

November 3, 1993

MAINE NARROW GAUGE RAILROAD CO & MUSEUM
Response to Section 14-320.55 of the Portland Land Use Code

The proposed change in use of 8,000 sf of Building 6, and the utilization of the existing outdoor yard at 58 Fore Street for the development of the Narrow Gauge Railroad Co. & Museum will not have an adverse impact on existing or future marine development opportunities. This statement is based on the following:

1. The proposed activities do not displace an existing water-dependent use:

2. The proposed uses do not reduce existing commercial vessel berthing space;

3. The proposed facilities, activities and related parking and improvements will not interfere with the operations and activities of water dependent uses, not will they impede access to Casco Bay or vessel berthing. Existing access ways and gates from Portland Yacht Services to the piers have been maintained with the proposed plans;

4. The siting of the new museum facilities does not reduce or inhibit existing public access to marine or tidal waters. The proposed plans will increase public access to the pedestrian path adjacent to Casco Bay.

ATTACHMENT D-4

CITY OF PORTLAND
Planning and Urban Development Department

MEMORANDUM

TO: Kay Wagenknecht-Harte, Urban Designer/Cultural Liaison

FROM: Craig R. Carrigan, PE, Development Review Coordinator

DATE: November 3, 1993

RE: 58 Fore Street - Change of Use (Phineas Sprague)

Kay, I have reviewed the plans and visited the site proposed for the Maine Narrow Gauge Railroad Company and Museum. I find the following to be true.

1. Construction of the proposed improvements will not result in any significant increase in stormwater runoff.

2. Construction of the proposed improvements will not result in any significant change in existing drainage patterns.

3. Construction of these improvements will not result in significant soil disturbance and will, therefore, not contribute to soil erosion or sedimentation problems.

4. Construction of these improvements will not result in any direct detrimental impacts to water quality.

5. The proposed improvements will be located in FEMA Flood Zone C (area of minimal flooding) as depicted on Community Panel 230051-0014B.

For these reasons I find no engineering objections to the construction of these improvements.

ATTACHMENT E-1

[illegible]
[illegible]
October 27, 1993

City Planning Board
389 Congress St
Room 211
Portland, Maine 04101

Gentlemen:

It is incomprehensible to me that you would even consider a rail fixed train anywhere in the city and particularly on the Eastern Promenade.

The Promenade is one of the city's treasures enjoyed by all the residents as well as visitors. To have a commercial venture like train rides would be absolutely incompatible with the area. It would also be a disservice to the residents of Munjoy Hill.

I also find it interesting that the Planning Board is [illegible]

ATTACHMENT E-2

Planning Board

I'm writing to tell you I am in favor of the 2-footsidewalk. How will our children + grandchildren ever know the "fun" of riding on a train, if we don't have it. It was one of the best times of my childhood, riding from Portland to Farmington, set up summer.

Loretta C. Jewett
Cumberland Center,

ATTACHMENT E-3

Oct, 25, 1973

To Planning Board

I'm writing to tell you I am in favor of the Rail road. How will our children and grandchildren ever know the "fun" of riding on a train, if we don't have it.

I had a lots of good times on trains 1938 to 1954.

Wallace E Leavitt
Cumberland Center

RECEIVED

SEP 3 0 1993

PORTLAND PLANNING OFFICE

ATTACHMENT E-4

Michael U. Trueworthy
70 Whitney Avenue
Portland, Maine 04102
(207) 772-7226

September 29, 1993

Dear Ladies and Gentlemen,

On October Twenty-eighth I must be at the Sheraton Inn while the board discusses the narrow gauge railroad at the base of the Eastern Promenade.

I want to take a side on the two-footer before Christmas. As a narrow gauge supporter it seems to me that all aesthetic, safety, and entertainment issues have been addressed by the railroad company and engineers in an exemplary fashion.

I think this venture will benefit Portland greatly and should move forward as fast as possible.

Very sincerely,

Michael U. Trueworthy

ATTACHMENT E-5

John P. and Kathleen T. Wirtz

October 15, 1993

Mr. Joseph E. Gray, Jr.
Director of Planning and Urban Development
City of Portland, Maine
389 Congress Street, Room 211
Portland, Maine 04101

Dear Mr. Gray:

For what we feel are extremely valid reasons, my wife and I are among those in the community -- an ever-growing number, I believe -- opposed to Phineas Sprague, Jr.'s proposal to operate an excursion railroad around the East End of Portland.

Considering Mr. Sprague's undoubted influence, as reflected in the glowing newsstories devoted to the man in the Press Herald (is canonization in the offing?) and his, and his Daddy's, substantial wherewithal, we realize that we face a formidable task.

Still, we persist.

Kathleen and I belong to the Munjoy Hill Neighborhood Organization and it was Nini McManamy, Pres. of MHNO, who suggested that it might not be inappropriate for us to get in touch with you.

We're the rankest of amateurs at this sort of thing -- contending with powerful interests, I mean -- but, being semi-retired, we do have some time (and zeal) to devote to the cause.

Mr. Gray, permit me, if you will, to phone your office with the hope of setting up an appointment for a brief chat with you on such matters as procedures and protocol, among other items.

I'll phone the early part of this next week. We look forward to the opportunity to meet with you at your convenience.

Appreciatively yours,

John P. Wirtz

45 Eastern Promenade Portland, Maine 04101 (207) 761-9660

ATTACHMENT E-6

TO: Mayor Anne Pringle

Sep 1, 93

FROM: Rodney and Melba Quinn, 45 Eastern Promenade

SUBJECT: Proposed Railroad on Eastern Promenade

We respectfully request that you consider at least the three following criteria when making your decision in this matter:

Pollution -- both noise and particulate
Location suitability -- best use of the location
Upkeep and performance -- guarantee of fiscal and esthetic responsibility

Pollution: The proponents say they will burn the "best coal" available. That leaves a great deal of room for future intepretation. Even with the "best", the neighbors will be losers, and if the "best" turns out to be "poor" -- particularly since the 19th century technology of these boilers was profligate in particulate discharge -- there is little doubt that it will add to existing atmospheric and health problems.

Proponents also say that the whistle will be blown three short times for each start or change in direction of the machine -- "in accordance with federal regulations". During the public day last summer when one engine was operated, we counted over twenty blasts in less than one hour -- and to call them "short" would be to stretch the word beyond reasonable limits.

In this connection, we question that "federal regulations" concern themselves with recreational vehicles or toys. We suspect that the proponents are using the "law" as justification for repeated whistle use. At any rate, if the "law" does apply, then it certainly must also apply to safety factors, crossings, right of way, uncontrolled access to track -- and above all, to handicapped access.

Location suitability. An iron track and machinery along the shoreline of the Promenade is not only far from "Marine Use", but would degrade the area for sight seeing, picnicking, or simple relaxation. Mixing machines with children, elderly, handicapped, and pets would appear not be be the "best" use that can be made of this precious resource. In this connection, the proponents also plan "a third rail" to permit possible future use by standard gauge trains. The inappropriatness of such an idea speaks for itself.

Is this location able to handle the automobile traffic it will generate? The only parking is along a busy street or within residential areas already saturated. To deliberately add to thse traffic problems for such a dubious justification seems to us unwise.

Upkeep and performance. Past performance or "track record" is a reasonable indicator of the future in most cases, and we do ask that you take a look at the condition, appearance, and history of Mr Sprague's property on Fore Street.

"Narrow gauge" may sound like a toy to many, but in fact it is a fully functioning steam machine, heavy enough to supply huge logs to sawmills, and to crush anything it is likely to encounter inopportunely in a park recreation area.

If Mr Sprague wishes to recreate historic Maine, it seems that a museum would be the proper vehicle. Sawmills were typical of early Maine, also, but they don't need to be operated to be appreciated.

Respectfully,

Rodney S Quinn

Melba R Quinn