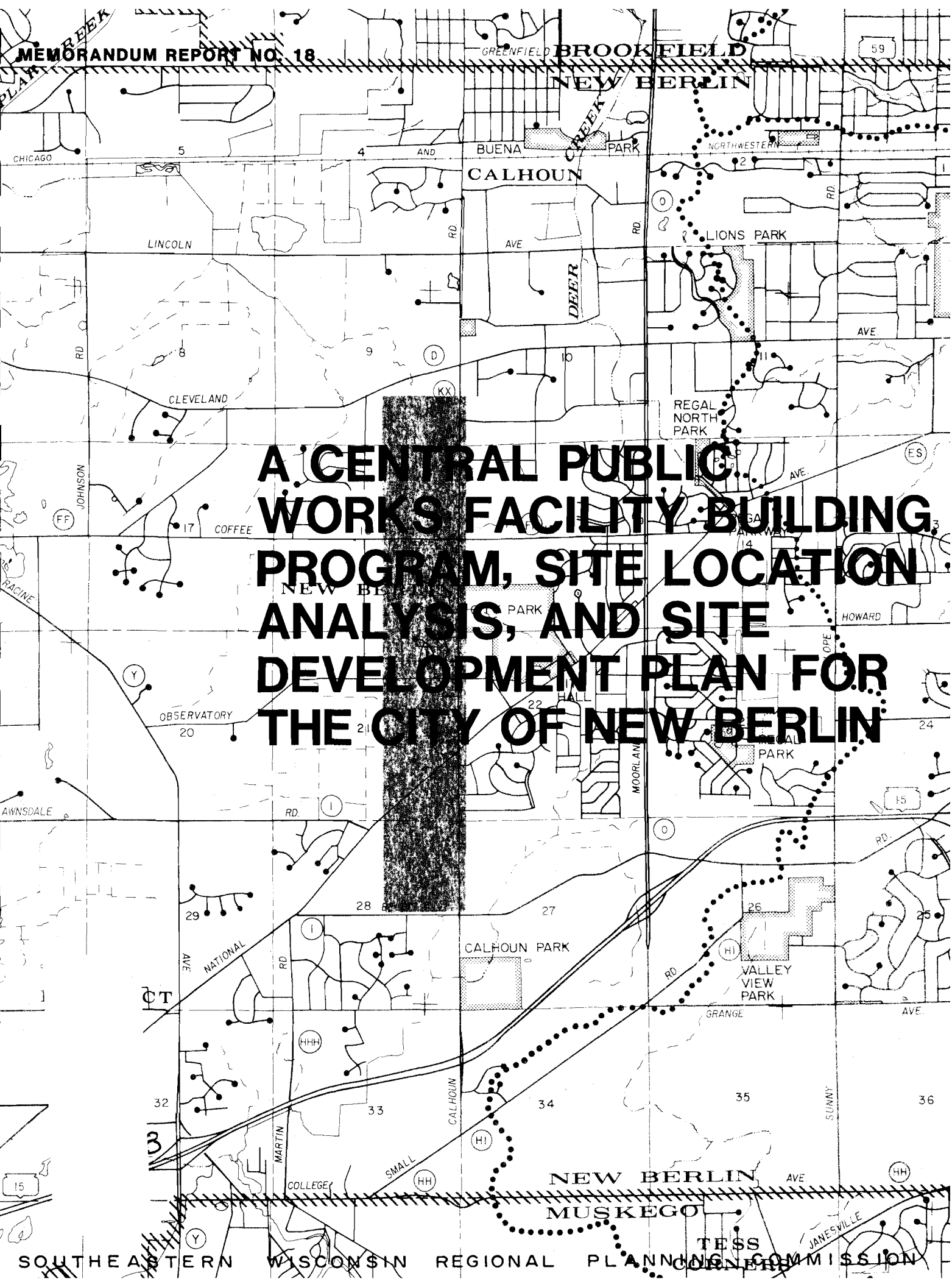
MEMORANDUM REPORT NO. 18



A CENTRAL PUBLIC WORKS FACILITY BUILDING PROGRAM, SITE LOCATION ANALYSIS, AND SITE DEVELOPMENT PLAN FOR THE CITY OF NEW BERLIN

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

KENOSHA COUNTY
Francis J. Pitts
Mary A. Plunkett
Sheila M. Siegler

RACINE COUNTY
John R. Hansen
James F. Rooney
Earl G. Skagen

MILWAUKEE COUNTY
Irene M. Brown, Secretary
Harout O. Sanasarian, Vice-Chairman
Jean B. Tyler

WALWORTH COUNTY
John D. Ames
Anthony F. Balestrieri, Chairman
Allen L. Morrison

OZAUKEE COUNTY
Allen F. Bruederle
Sara L. Johann
Alfred G. Raetz

WASHINGTON COUNTY
Daniel S. Schmidt
Patricia A. Strachota
Frank F. Uttech

WAUKESHA COUNTY
Richard A. Congdon
Robert F. Hamilton
William D. Rogan, Treasurer

CITY OF NEW BERLIN OFFICIALS

MAYOR
Timothy K. Tully

COMMON COUNCIL
Kenneth T. Czyzewski
David J. Dvorak
Mary A. Lazich
Bruce K. Patterson
Thomas J. Shively
Stanton W. Smith
Jeffrey Stuckert

CITY PLAN COMMISSION
Timothy K. Tully, Chairman
Ralph A. Becker, P. E.
John J. Katerinos
Mary A. Lazich
Wallace R. Lee, Jr.
Dennis Novak
Emil Paradowski

BOARD OF PUBLIC WORKS
Ralph A. Becker, P. E.
David J. Dvorak
Mary A. Lazich
Stanton W. Smith
Timothy K. Tully

CITY CLERK
Florence M. Greve

DIRECTOR OF PUBLIC WORKS/CITY ENGINEER
Ralph A. Becker, P. E.

STREET DEPARTMENT SUPERINTENDENT
William Casper

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION STAFF

Kurt W. Bauer, PE, AICP, RLS. . . . . Executive Director
Philip C. Evenson, AICP . . . . . Assistant Director
Kenneth R. Yunker, PE . . . . . Assistant Director
Robert P. Biebel, PE . . . . . Chief Environmental Engineer
John W. Ernst. . . . . Information Systems Manager
Gordon M. Kacala . . . . . Chief Economic Development Planner
Leland H. Kreblin . . . . . Chief Planning Illustrator
Donald R. Martinson . . . . . Chief Transportation Engineer
Bruce P. Rubin . . . . . Chief Land Use Planner
Roland O. Tonn, AICP . . . . . Chief Community Assistance Planner
Joan A. Zenk . . . . . Administrative Officer

Special acknowledgement is due Patrick J. Meehan, AIA, SEWRPC Principal Planner, for his contribution to the preparation of this report.

MEMORANDUM REPORT NUMBER 18

A CENTRAL PUBLIC WORKS FACILITY BUILDING PROGRAM, SITE LOCATION ANALYSIS, AND SITE DEVELOPMENT PLAN FOR THE CITY OF NEW BERLIN

WAUKESHA COUNTY, WISCONSIN

Prepared by the

Southeastern Wisconsin Regional Planning Commission
P. O. Box 1607
Old Courthouse
916 N. East Avenue
Waukesha, Wisconsin 53187-1607

May 1987

Inside Region $5.00
Outside Region $10.00

(This page intentionally left blank)

TABLE OF CONTENTS

TABLE OF CONTENTS

Chapter I

INTRODUCTION

INTRODUCTION

By letter dated June 2, 1986, the City of New Berlin requested that the staff of the Southeastern Wisconsin Regional Planning Commission assist the City in the conduct of a study to determine the best location for, and configuration of, a new central public works facility to serve the City. The study was to include: 1) an inventory of the current central public works-related facility and of major pieces of public works equipment to be housed at that facility; 2) the development of locational and site design criteria for a new facility; 3) the development of a central public works facility building and site development program; 4) the conduct of alternative central public works facility location and site evaluations; 5) the development of a central public works facility plan for the recommended site; and 6) the preparation of a cost estimate for the construction of the central public works facility.

THE STUDY AREA

The study area considered consists of the City of New Berlin. The City is located in eastern Waukesha County. The City is bounded on the north by the City and Town of Brookfield; on the south by the City of Muskego; on the east by the Village of Hales Corners, the City of Greenfield, and the City of West Allis; and on the west by the Town of Waukesha. The City of New Berlin consists of U. S. Public Land Survey Sections 1 through 36 in Township 6 North, Range 20 East, and portions of Sections 5 and 6 in Township 5 North, Range 20 East, all in Waukesha County, Wisconsin. The total study area encompasses an area of about 36.8 square miles. Based upon city policy as set forth in the recently adopted city land use and urban design plan, expansion of the City into currently unincorporated areas of the County is not intended during the planning period which extends to the year 2010. Therefore, forecasts used in the central public works facility study are based upon the geographic area described above.

NEED FOR THE STUDY

The City of New Berlin currently houses its central public works facility--Street Department and Water and Sewer Department--on an eight-acre site located on the north side of W. National Avenue between Observatory Road and Civic Drive. The Street Department services and maintains all streets for which the City of New Berlin is responsible. In addition, the Street Department services and maintains all city-owned drainage and stormwater-related facilities. The Water and Sewer Department services and maintains the city-owned public water supply and sanitary sewer systems.

The National Avenue site and buildings are of an inadequate size to accommodate present, much less future, facility needs of the City with respect to both the Street Department and Water and Sewer Department. This is due, in part, to the inadequacy of the site for future expansion to accommodate addi-

tional building space unless adjacent public park lands are designated for facility expansion. Adequate storage space is not available at the National Avenue facility to properly house all of the public works-related equipment currently used by the two Departments. The existing public works site and its associated buildings can, however, provide adequate space to house the Water and Sewer Department facilities and equipment. Indeed, if the Street Department equipment was housed elsewhere, the existing National Avenue site should be able to accommodate both Park Department and Water and Sewer Department spatial needs to the year 2010. This would indicate a need to find another site in the City--properly located--to accommodate the existing and probable future spatial needs of the Street Department, as well as the needs of any additional public works services which may be assumed by the City--such as municipal solid waste collection and transportation. Specific spatial allocations relating to the existing National Avenue site are presented in Chapter II.

The size and configuration of the central public works facility is a function of the resident population to be served and of the type and amount of public works facilities to be maintained. Therefore, to properly plan for a new central public works facility, pertinent information is required about both the historic and probable future resident population levels of the community, about existing and probable future urban land uses, and about existing and probable future street mileage to be serviced and maintained. Data on the historic and probable future total resident population, total number of occupied housing units, number of persons per occupied housing unit within the City, on the existing and probable future land uses in the City, and on the existing and probable future length of streets to be serviced and maintained by the City are shown in Tables 1, 2, and 3.

Table 1 indicates a relatively rapid rate of growth in resident population for the City from 1960 to 1980. In more recent years however, this rapid rate of growth had abated and this recent change must be considered in the preparation of the population forecasts to be used in this study. In 1986, the City of New Berlin Plan Commission completed and adopted a new land use and urban design plan for the year 2010 which, due to explicit public reaction requesting that the City attempt to discourage excessive population growth over the plan design period, selected a forecast resident population level for the City in the year 2010 of 43,000 persons. This represents an increase of 12,471 persons, or about 41 percent over this period. In 1980, there were 9,350 occupied housing units in the City and this number is expected to increase to about 15,170 units by the year 2010, representing an increase of 5,820 units, or 62 percent. Table 1 also compares historic and probable future household size in the City and indicates that in 1980, the average household size in the City was 3.26 persons. In the year 2010, the average household size in the City is expected to decline to 2.77 persons, or 15 percent.

Table 2 indicates that the various urban land uses in the City may be expected to increase from 7,923 acres in 1980 to 11,969 acres in the year 2010, represening a total increase of 4,046 acres of urban land use, or 51 percent over the 1980 figure. In the urban land use categories, residential land uses are expected to increase from 6,291 acres in 1980 to 8,851 acres in the year 2010, representing an increase of 2,561 acres during this period, or 63 percent of total urban land use increase.

Table 1

TOTAL HISTORIC AND FORECAST RESIDENT POPULATION, OCCUPIED HOUSING UNITS, AND PERSONS PER OCCUPIED HOUSING UNIT IN THE CITY OF NEW BERLIN: 1960 TO 2010

Characteristics	Year									
	Actual			1970-1980		Forecast				
	1960	1970	1980	Change	Percent	1990	1995	2000	2005	2010
Total Population	15,788	26,910	30,529	3,619	13.4	33,150	35,610	38,070	40,540	43,000
Total Occupied Housing Units	3,972	6,768	9,350	2,582	27.6	10,540	11,615	12,660	13,870	15,170
Persons Per Occupied Housing Unit	3.91	3.92	3.26	-0.66	-16.8	3.10	3.02	2.94	2.86	2.77

Source: U. S. Bureau of the Census and SEWRPC.

Table 2

EXISTING 1980 CITY OF NEW BERLIN LAND USE AND YEAR 2010 ADOPTED LAND USE PLAN LAND USES

Land Use Category	Existing 1980 City Land Use		Plan Increment		2010 Planned Land Use	
	Acres	Percent of Total	Acres	Percent of Increase	Acres	Percent of Total
Residential						
Rural Estate (5-acre lots or greater)	41[d]	0.1	0[e]	--[e]	0[e]	--[e]
Suburban (1.5 acre to 5-acre lots)	1,116	4.7	153	13.7	1,269	5.3
Low-Density Urban (20,000 to 62,000-square-foot lots)	3,295	14.0	1,562	47.4	4,857	20.6
Medium-Density Urban (10,000 to 20,000-square-foot lots)	1,756	7.4	439	25.0	2,195	9.3
High-Medium Density Urban (4.4 to 6.9 units per net residential acre)	7	0.0[f]	188	2,685.7	195	0.8
High-Density Urban (7.0 to 12.0 dwelling units per net residential acre)	76	0.3	259	340.7	335	1.4
Residential Subtotal	6,291	26.7	2,560	40.7	8,851	37.5
Commercial	355[b]	1.5	136[c]	38.3	358[c]	1.5
Industrial	525[c]	2.2	697[c]	132.7	1,355[b]	5.7
Governmental/ Institutional	400	1.7	146	36.5	546	2.3
Recreational	352	1.5	507	144.0	859	3.6
Agricultural and Other Rural Lands	15,666	66.4	-4,005	-25.6	11,620	49.4
Total	23,589	100.0	23,589	--	23,589	100.0

[a]Each land use category area is expressed in gross acres which includes associated street rights-of-way and off-street parking.

[b]133 acres of existing industrial related commercial service uses are included in this figure. These uses are located, for the most part, at the existing industrial park.

[c]Excluding 133 acres as per footnote [b] and also other existing scattered commercial sites.

[d]Represents 82 occupied residential lots totalling 596 acres. However, only 41 developed acres are shown here; the other 514 acres are included in the category "Agricultural and Other Rural Lands."

[e]138 lots of about 1,032 acres actually are planned but have been included in the "Agricultural and Other Rural Lands" category due to their predominant rural character.

[f]Less than 0.1 of 1 percent.

Source: SEWRPC.

Table 3

EXISTING 1980 AND FORECAST YEAR 2010 CITY SERVICED AND MAINTAINED STREETS IN THE CITY OF NEW BERLIN

Characteristic	Year							
	Actual	Forecast					1980-2010	
	1980	1990	1995	2000	2005	2010	Change	Percent
Streets (miles)	163.87	189.99	203.05	216.11	229.18	242.24	78.37	47.8

Source: SEWRPC

As indicated in Table 3, the total number of miles of streets to be serviced and maintained by the City may be expected to increase from about 164 miles in 1980 to 242 miles in the year 2010, representing an increase of about 78 miles, or almost 48 percent.

These forecasts are used as a basis for the conduct of this study and are important in the architectural programming process. The determination of current, as well as anticipated, site and building space needs require careful consideration of such forecasts.

FORMAT OF REPORT PRESENTATION

This planning report sets forth the findings and recommendations of the requested study. The report consists of eight chapters and associated appendices. Chapter I, "Introduction," briefly discusses the need for conduct of the study; and presents pertinent data on the historic and probable future resident population levels of the City. Chapter II, "Existing Central Public Works Facility and Equipment, and Forecast Needs," describes the existing spatial and functional areas of the current central public works facility, inventories the major pieces of equipment housed at the existing facility, and forecasts equipment needs to the design year 2010. Chapter III, "Locational and Site Design Criteria," sets forth a set of noneconomic criteria used in evaluating alternative central public works facility site locations, selecting a recommended site, and in developing the building and site development program, as well as the site plan development plan for the recommended site. Chapter IV, "Central Public Works Facility Building and Site Development Program," presents the minimum spatial requirements for the new central public works facility to serve existing and probable future needs to the design years 1995 and 2010 and provides the basis for the preparation of the site development plan and construction cost estimates. Chapter V, "Alternative Central Public Works Facility Sites and Noneconomic Site Selection Evaluation," documents the results of the evaluations of each of the alternative sites studied, and presents a ranking of the alternative sites based upon the criteria presented in Chapter III. Chapter VI, "Central Public Works Facility Site Plan Design for the Recommended Site," presents recommendations for the location and development of the facility site. Chapter VII, "Central Public Works Facility Construction Cost Estimate Analysis," presents an estimate of the cost expressed in current--1985--dollars of the construction of the recommended facility at the recommended site. Chapter VIII, "Summary, Conclusions, and Recommendations," provides a summary of the significant findings and recommendations of the central public works facility study.

Chapter II

EXISTING CENTRAL PUBLIC WORKS FACILITY AND EQUIPMENT, AND FORECAST NEEDS

THE EXISTING CENTRAL PUBLIC WORKS FACILITY AND FORECAST STREET DEPARTMENT EQUIPMENT NEEDS

The existing central public works facility which serves the City of New Berlin is located in the Northwest one-quarter of U. S. Public Land Survey Section 22, Township 6 North, Range 20 East, City of New Berlin, on the north side of W. National Avenue between Observatory Road and Civic Drive. The location of the existing facility is shown on Map 1 and a site plan of the existing facility is shown in Figure 1. The allocation of space for various functions at the existing central public works facility site is summarized in Tables 4 and 5.

In 1986, the City of New Berlin owned and operated 65 pieces of public works-related equipment all housed at the central W. National Avenue site. Table 6 indicates the types and quantity of equipment operated in 1986, as well as the forecast equipment needs for the City in the years 2000 and 2010. The forecast equipment needs were determined, in part, upon the anticipated increases in resident population, land use, and public street mileage, all as set forth in Chapter I, and the design criteria presented in Chapter III. It is anticipated that the facility will need to house about 80 total pieces of equipment by the year 2000, and about 110 total pieces of equipment by the year 2010.

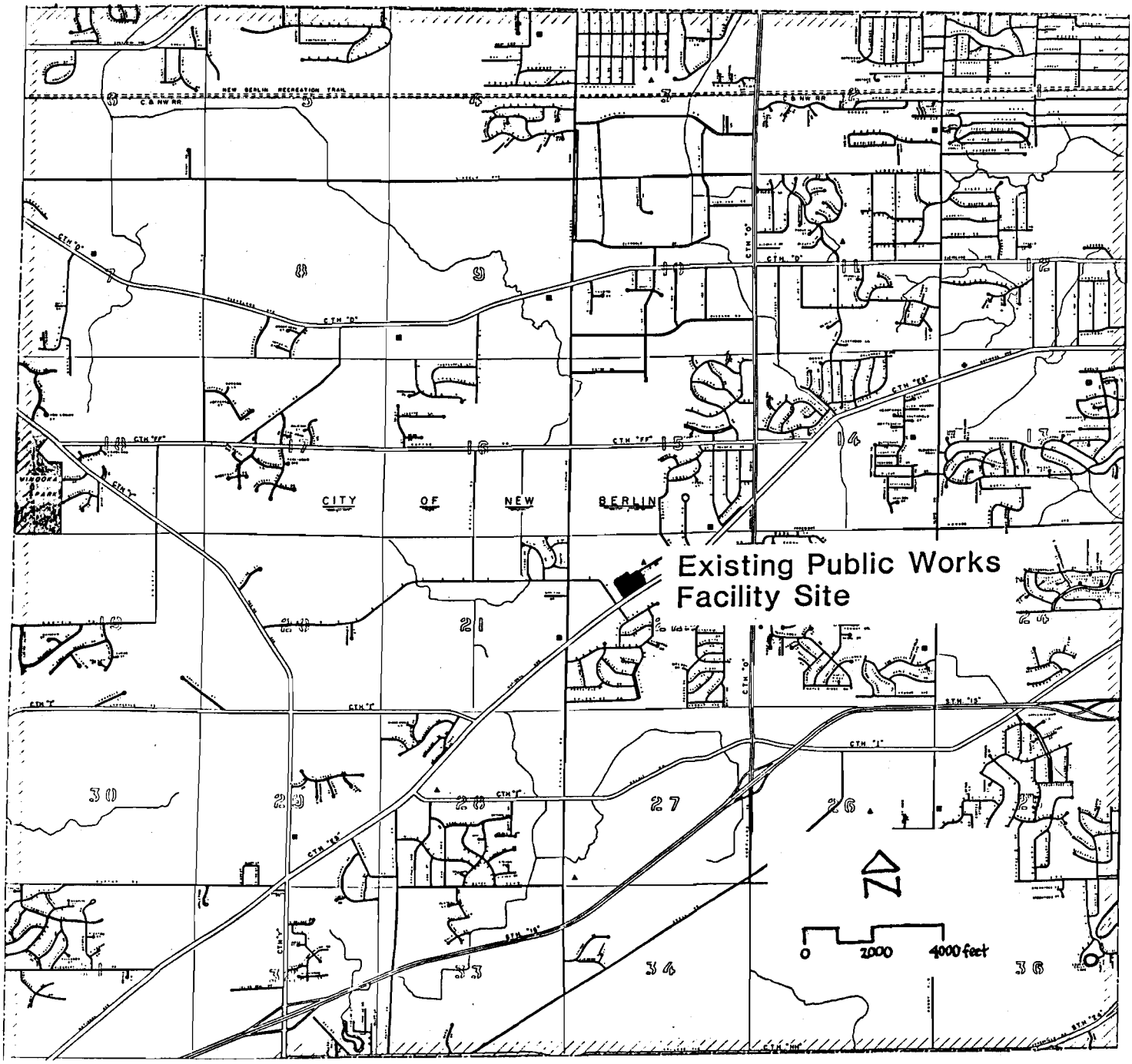
SOLID WASTE DISPOSAL CONSIDERATIONS

The growing per capita generation of solid wastes and the heightened public awareness of the need to process and dispose of those wastes in an environmentally sound manner, has resulted in solid waste management becoming an increasingly important issue of concern to elected officials at the state, county, and local levels of government. It is currently estimated that the total amount of residential solid waste generated in the greater Milwaukee area totals about 2.6 pounds per person per day. It is forecast that this amount will increase to about 3.5 pounds per person per day by the year 2010, representing an increase of about 0.9 pound, or about 35 percent, over the 25-year planning period.

Proper long-range planning can help to minimize the costs assocated with the management of these solid wastes, as well as assure protection of the overall quality of the environment. This is especially important in the City of New Berlin because of the large quantities of wastes generated and the City's current dependence upon private waste disposal companies for the collection and ultimate disposal of residential generated solid waste. Good public administration would dictate that in the building and site programming of a new central public works facility to serve the City of New Berlin through the year 2010, the possibility of municipal solid waste collection, transport, and disposal--at least for residential areas of the City--be considered and provided.

Map 1

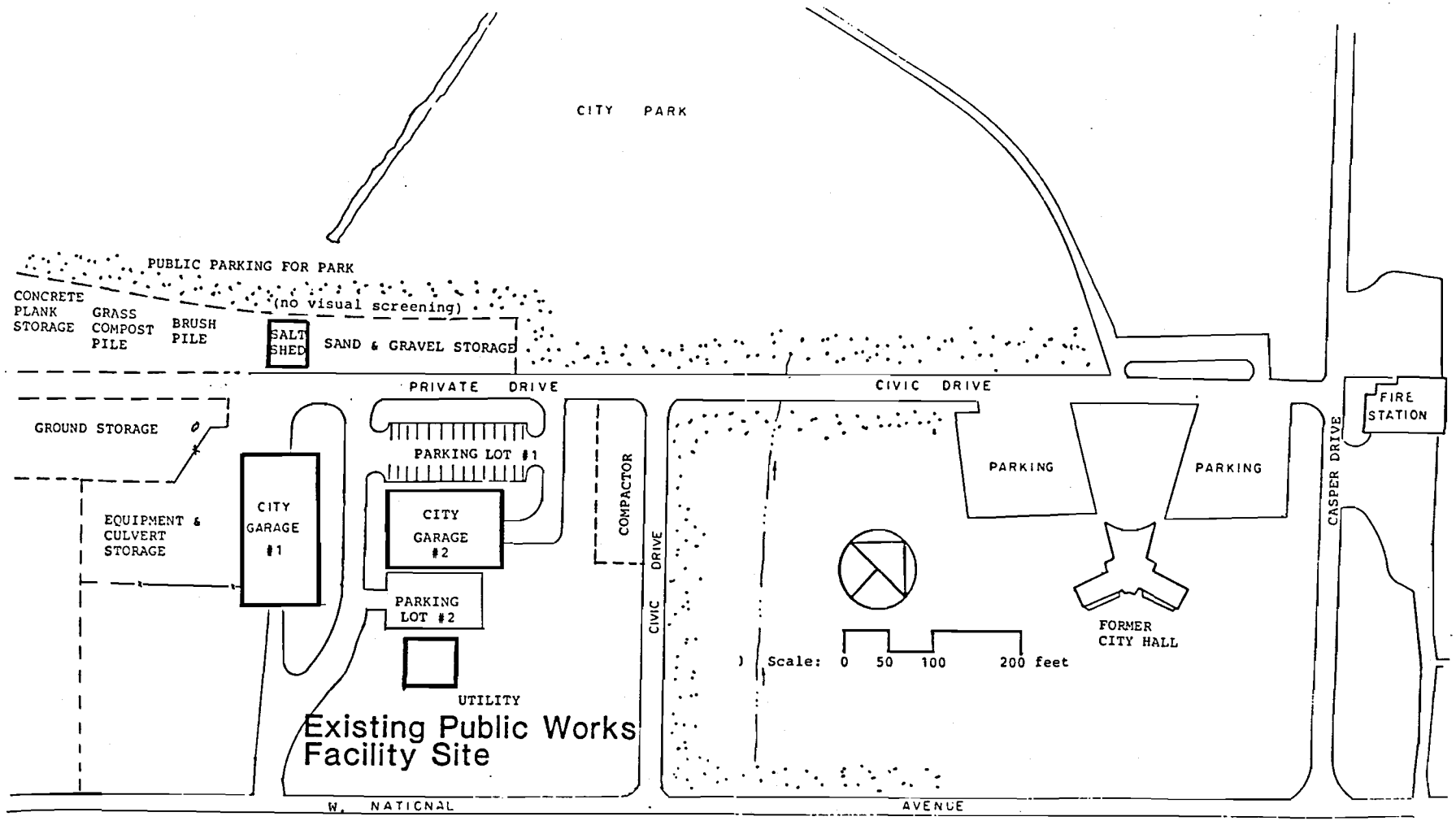
LOCATION OF THE EXISTING CENTRAL PUBLIC WORKS FACILITY
IN THE CITY OF NEW BERLIN



Source: SEWRPC

Figure 1

SITE PLAN OF THE EXISTING CENTRAL PUBLIC WORKS FACILITY
IN THE CITY OF NEW BERLIN



Source: City of New Berlin Engineering Department and SEWRPC.

Table 4

CITY OF NEW BERLIN CENTRAL PUBLIC WORKS
FACILITY SITE SPATIAL ALLOCATIONS: 1986

Use/Activity	Area[a] (square feet)	Percent of Total
Buildings/Structures:		
City Garage #1	13,600	3.9
City Garage #2	9,600	2.8
Salt Shed	2,000	0.6
Utility Building	3,600	1.0
Subtotal	28,800	8.3
Outdoor Areas:		
Concrete Plank Storage	4,900	1.4
Grass Compost Pile	4,900	1.4
Brush Pile	7,000	2.0
Sand and Gravel Storage	19,200	5.5
Ground Storage	24,500	7.0
Equipment and Culvert Storage	36,000	10.3
Compactor Area	12,000	3.4
Parking Lot #1 (for 30 Automobiles)	11,700	3.4
Parking Lot #2 (for 18 Automobiles)	7,150	2.1
Other Open Space and Drive Areas	192,330	55.2
Subtotal	319,680	91.7
Total	348,480	100.0

[a]Approximate areas.

Source: SEWRPC.

Table 5

CITY OF NEW BERLIN CENTRAL PUBLIC WORKS
FACILITY BUILDING SPATIAL ALLOCATIONS: 1986

Use/Activity	Area[a] (square feet)	Percent of Total
City Garage #1:		
Offices	600[b]	2.3
Sign Construction Workroom	600	2.3
Vehicle Storage	13,000	50.4
Subtotal	14,200	55.0
City Garage #2:		
Vehicle and Other Storage	9,600	37.2
Subtotal	9,600	37.2
Salt Shed	2,000	7.8
Total	25,800	100.0

[a]Approximate areas.

[b]On a second level within the building and located above the office area.

Source: SEWRPC.

Table 6

EXISTING 1986 AND FORECAST YEAR 2000 AND 2010 CITY OF NEW BERLIN STREET DEPARTMENT AND SOLID WASTE COLLECTION EQUIPMENT

Type of Equipment	Year and Quantity			1986 to 2010 Equipment Increment by Equipment Type
	1986 Existing	2000 Forecast	2010 Forecast	
Public Works Equipment				
Dump Trucks	23	25	30	7
Superintendent Car	1	1	1	0
Foreman Pick-up Truck	1	1	1	0
Foremen Cars	2	3	3	1
Pick-up Truck	1	1	1	0
Army Trucks	3	2	2	-1
Van	1	2	4	3
Grader	2	3	3	1
Front-end Loader	1	2	3	2
Steamers (on Truck)	2	2	2	0
Tar Kettle (on Trailer)	1	2	2	1
Tilt-top Trailer	1	1	1	0
Backhoe/Frontend Loader	2	2	2	0
Roller	2	2	2	0
Weed Sprayer (200 gal.)	1	2	2	1
Portable Pumps	3	3	3	0
Portland Cement Concrete Mixer.	2	2	2	0
Tractor/Auger Post Digger	1	2	2	1
Backhoe	2	3	3	1
Street Sweeper	1	2	3	2
Crawler/Bulldozer	1	2	2	1
Line Stripper	1	1	1	0
Portable Generator	1	1	1	0
Flat-bed Trailer (2-wheel)	1	1	1	0
Brush Chippers	2	3	3	1
Snow Blower	2	3	3	1
Tractors	3	5	5	2
Wheel Loader	1	3	3	2
Solid Waste Collection Equipment				
Garbage Collection Trucks	--	--	14	14
Superintendent Car	--	--	1	1
Foremen Cars	--	--	2	2
Solid Waste Transfer Vehicles[a]	--	--	2	2
Totals	65	82	110	45

[a]Storage for these vehicles should be provided at the site even though they may be owned by a private contractor.

Source: City of New Berlin Public Works Department and SEWRPC.

In addition, because of changing economic conditions and the relative value of materials commonly found in solid wastes, and owing to the increasing costs of disposal of such wastes and limited landfill capacities, processing to recover certain elements of the waste stream and reduce the bulk and overall volume of the solid waste materials may be expected to become more viable over time. Additional management steps which can be considered in response to this probability are source reduction, source separation, storage, processing and treatment, and resource recovery. Several of these steps, if eventually initiated by the City, have important implications for the building and site programming of the new central public works facility.

Source separation is defined as the pre-collection resource recovery and may include the removal of certain recyclable materials, such as newspaper, glass, waste oil, and metal beverage containers. The success of a source separation program is heavily dependent on public participation. For commercial and industrial users, source separation may be employed to remove certain materials that are not suited for inclusion in the general waste stream, such as bulky materials or toxic and hazardous wastes, materials that therefore require special handling and disposal. Source separation may also be considered a form of source reduction if the material can be separated and removed from the waste upstream for reuse. Source separation may, in turn, require specialized space or equipment at the central public works facility.

Storage of solid waste occurs prior to collection but can also be practiced following collection at a transfer station prior to transport to the disposal site. A transfer station is a facility where solid waste is received from relatively small collection vehicles and stored and/or placed into large long-haul vehicles before being transported to the disposal site. Storage of solid waste may also require specialized space or equipment at the central public works facility.

Processing is a physical operation that is designed to reduce the amount of material, to improve its handling characteristics, or to improve its usefulness. Processing methods include classification of wastes, separation, baling, and shredding. Treatment functions are generally considered to be biological or chemical processes including such unit processes as composting and bioconversion. Composting and shredding operations are current solid waste processing functions carried out at the City of New Berlin central public works facility and which may require specialized space and equipment at the new facility.

Based upon the findings of various public solid waste management planning efforts currently underway, the ultimate disposal of the solid waste collected would most likely be either a Waukesha County operated incinerator or a commercial general use landfill site. For the purposes of this study, it was assumed that the ultimate destination of the solid waste collected would be within a 60-minute one-way driving distance from the central public works facility site. All solid waste collection and transportation vehicles and equipment would require both storage and maintenance space at the central public works facility site and the site would have to accommodate the spatial needs of the facilities for the various personnel needed to operate and maintain collection and transportation vehicles and equipment.

A knowledge of the existing and forecast amount of solid waste generated by the City residents is important to the development of the central public work facility building and site development program. Also, the amount of solid waste to be generated in various locations throughout the City is important to the determination of the optimum location for the new central public works facility with respect to residential solid waste collection. Residential solid wastes are defined as those solid wastes which are generated by resident households, including households residing in multi-family dwelling units and consist mainly of food wastes, ashes, and rubbish. Rubbish includes paper, cardboard, garden and lawn trimmings, plastics, and textiles. These wastes also contain limited amounts of toxic and hazardous materials such as paints, cleaning compounds, and pesticides. These wastes are sometimes referred to as domestic, municipal, or household wastes and include all wastes normally generated by household activities.

Table 7 presents estimated existing and forecast residential solid waste quantities for the City from 1980 to 2010 in terms of annual average (tons/year), monthly average (tons/day), daily average (tons/day), maximum month (tons/day), and maximum day (tons/day). By applying the data presented in Table 7 and the design criteria presented in Chapter II, it was determined that if public collection and disposal of residential solid wastes is initiated within the City, the City would require 13 solid waste collection trucks (12 primary vehicles and one secondary back-up vehicle), two solid waste foreman cars, and one solid waste superintendent car, all to be housed at the central public works facility site in the year 2010. These data pertaining to vehicular needs are presented in Table 6.

Table 7

CITY OF NEW BERLIN POPULATION AND ESTIMATED EXISTING AND FORECAST RESIDENTIAL SOLID WASTE QUANTITY: 1980 TO 2010

Category	Year						
	1980	1985	1990	1995	2000	2005	2010
Population	30,529[2]	30,688[2]	33,150[3]	35,610[3]	38,070[3]	40,540[3]	43,000[3]
Estimated Existing and Forecast Solid Waste Quantity:[1]							
Annual Average (tons/year)	16,714	16,801	18,754	20,796	22,927	25,155	27,466
Monthly Average (tons/day)	69	70	78	87	96	105	114
Daily Average (tons/day) .[4].....	64	65	72	80	88	97	106
Maximum Month (tons/day)[5].....	97	98	109	122	134	147	160
Maximum Day (tons/day)	109	111	122	136	150	165	180

[1]Assuming residential collection only at 3 pounds per capita per calendar day, including yard waste in 1980 and 1985; 3.1 pounds in 1990; 3.2 pounds in 1995; 3.3 pounds in 2000; 3.4 pounds in 2005; and 3.5 pounds in 2010. These estimates assume that there will be no private collection at any of the multiple-family residential developments. Except for the annual average (which is based upon a 365-day year) all other estimates assume collection at five days per week to arrive at total tons per day.

[2]Actual population.

[3]Forecast population.

[4]Determined by multiplying the monthly average by 1.4.

[5]Determined by multiplying the daily average by 1.7.

Source: SEWRPC.

(This page intentionally left blank)

Chapter III

LOCATIONAL AND SITE DESIGN CRITERIA

INTRODUCTION

In order to properly locate a site and design a site plan for a central public works facility, spatial, locational, and site planning design criteria of a high level of specificity must be established. Taken together, these criteria define the characteristics which the central public works facility should possess in order for the site to properly perform its intended functions. These criteria can then be applied to identify and to assist in evaluating alternative sites for the central public works facility. In this chapter, the necessary criteria are presented including criteria related to site location, environmental protection, functional area requirements of the site, user motor vehicle characteristics, automobile parking facility design, easements, storm-water drainage and erosion/sedimentation control, and the general landscaping of the site.

SITE LOCATION CRITERIA

Proximity to Streets and Residential Areas Serviced by Public Works and Municipal Solid Waste Collection Equipment

The central public works facility should be centrally located so as to minimize distance to both existing and probable future streets and land uses to be served.

Compatibility With Neighboring Land Uses

The central public works facility should be compatible with adjoining land uses and structures and should not adversely affect neighboring land uses with respect to noise, odor, appearance, traffic, or health.

Traffic Conflicts

The central public works facility should not be located in an area where traffic conflicts can seriously impede truck or other vehicular flows or safety. Trucks and other equipment entering or leaving the facility should not interfere with traffic moving on arterial streets and highways. The central public works facility should not be located so close to arterial street and highway intersections that traffic backups may prevent equipment from leaving or entering the facility.

Environmental Corridor Protection

The central public works facility should not be constructed in areas identified as environmental corridors or isolated natural areas in the adopted city land use and urban design plan.

Man-made and Natural Barriers

The central public works facility should be located to avoid natural or man-made barriers which may require time-consuming detours of equipment to reach service areas.

Soils
The proper relation of a public works facility to soil type and distribution can serve to avoid the creation of costly developmental and environmental problems. The location of a public works facility should avoid areas covered by soils identified in the regional soil survey as having very severe limitations for the construction of light industrial and commercial buildings. In locations covered by soils identified as having severe limitations for the construction of light industrial and commercial buildings, careful engineering will be required in order to overcome the severe limitations at these locations and to make usable otherwise unusable lands which may otherwise remain vacant and undeveloped.

Zoning
The central public works facility site should be located in a zoning district which provides for uses compatible with, and specifically permits the location and development of, the facility.

Conformance With the Adopted City Land Use and Urban Design Plan
The location and design of the central public works facility should be in general conformance with, and should serve to implement, the adopted city land use and urban design plan.

SITE DESIGN REQUIREMENTS AND CRITERIA

Site Size and Configuration
Sufficient site area should be available to accommodate both the present and probable future needs of a central public works facility. The site shape or configuration should be adequate for the use of the site for such a facility.

Site Expansion Capabilities
The site should afford adequate capability for the expansion of the public works facility both during and after the planning period.

Public Access to the Public Works Facility
All-weather access to the public works facility should be provided and limited to specific times when an attendant is on duty.

Setbacks, Side Yards, and Buffer Areas
A minimum building setback of 100 feet from street right-of-way and all other property lines should be provided to ensure good visibility by vehicle drivers while departing from the facility; to ensure adequate visual distances for passing traffic; to aesthetically enhance the facility, providing for adequate landscaping; and to minimize the potential of adverse impacts upon surrounding land uses by providing a buffer area and sufficient landscape screening.

Buildings
The following public works facility functional areas should be housed in completely enclosed buildings at the public works facility site: public works administration, public works vehicle maintenance and storage, snow and ice control chemical storage, solid waste transfer facilities, and all processing and related equipment of any kind.

Site Slope and Drainage: Maximum slope of the site should be 3 percent and adequate, properly engineered, drainage should be maintained on the site.

Composting Windrow Design

Composting windrows should be designed to be approximately six feet in height and 12 feet wide at the base. The composting windrows may vary in length depending upon the amount of material to be composted.

MOTOR VEHICLE CHARACTERISTICS

General Vehicle Specifications

The public works facility and its associated streets, drives, parking, and maintenance areas should be designed to accommodate motor vehicles of the type expected to be operated by the users of the public works facility-staff and public patrons. These types of motor vehicles include the passenger car, single-unit trucks, and intermediate size semitrailer-tractor combination trucks. The general vehicle dimensions or specifications important to effective site planning for these types of vehicles are summarized in Table 8 and in Figure 2. The vehicle dimensions are shown for the typical wheelbase, front overhang, rear overhang, overall length, overall width, height, minimum outside turning radius to the path of the left front wheel, and minimum inside turning radius to the path of the right rear wheel.

Large Motor Vehicle Job Assignment Characteristics

Primary Plow/Dump Trucks: There should be at least one (1) plow/dump truck assigned for each 10 linear miles of serviceable public streets in the City.

Secondary Plow/Dump Trucks: There should be one (1) secondary or spare plow/dump truck assigned for each six (6) primary plow/dump trucks to allow for the servicing of primary plow/dump trucks and use of such secondary plow/dump trucks during times of emergency.

Primary Solid Waste Collection Trucks: There should be one (1) solid waste collection truck assigned for each 13.5 tons of residential solid waste generated per average day of the maximum month. This standard assumes that each truck has a capacity of 25 yards at 550 pounds of waste per cubic yard, each truck unloading at the transfer facility twice each weekday. This also assumes an average of approximately 280 stops or collection points per day per truck.

Secondary Solid Waste Collection Trucks: There should be one (1) secondary solid waste collection truck assigned for each twelve (12) primary solid waste collection trucks to allow for servicing of primary solid waste collection trucks and use of such secondary solid waste collection trucks during times heavy loadings or emergencies.

Solid Waste Transfer Vehicles: The solid waste transfer vehicle size assumed to be used at the site is the 75 cubic yard size carrying a payload of 20 tons. The total number of transfer vehicles required should be based upon the amount of solid waste generated per average day of the maximum month and the distance/time factor to haul a load to the disposal site. For the purposes of this study, an average one-way travel time of one (1) hour was used. It was

Table 8

SITE-RELATED PHYSICAL CHARACTERISTICS OF MOTOR VEHICLES
TYPICALLY USED AT A PUBLIC WORKS FACILITY

Type of Motor Vehicle	Typical Dimensions in Feet[a]							
	Wheelbase	Front Overhang	Rear Overhang	Overall Length	Overall Width	Height	Minimum Outside Turning Radius[b]	Minimum Inside Turning Radius[c]
Passenger Car	11	3	5	19	7	--	24	14.9
Single-Unit Truck...	20	4	6	30	8.5	13.5	42	27.8
Intermediate Size Semitrailer-Tractor Combination	13+27=40	4	6	50	8.5	13.5	40	17.7

[a]Variable somewhat, depending upon the vehicle manufacturer and type of vehicle.

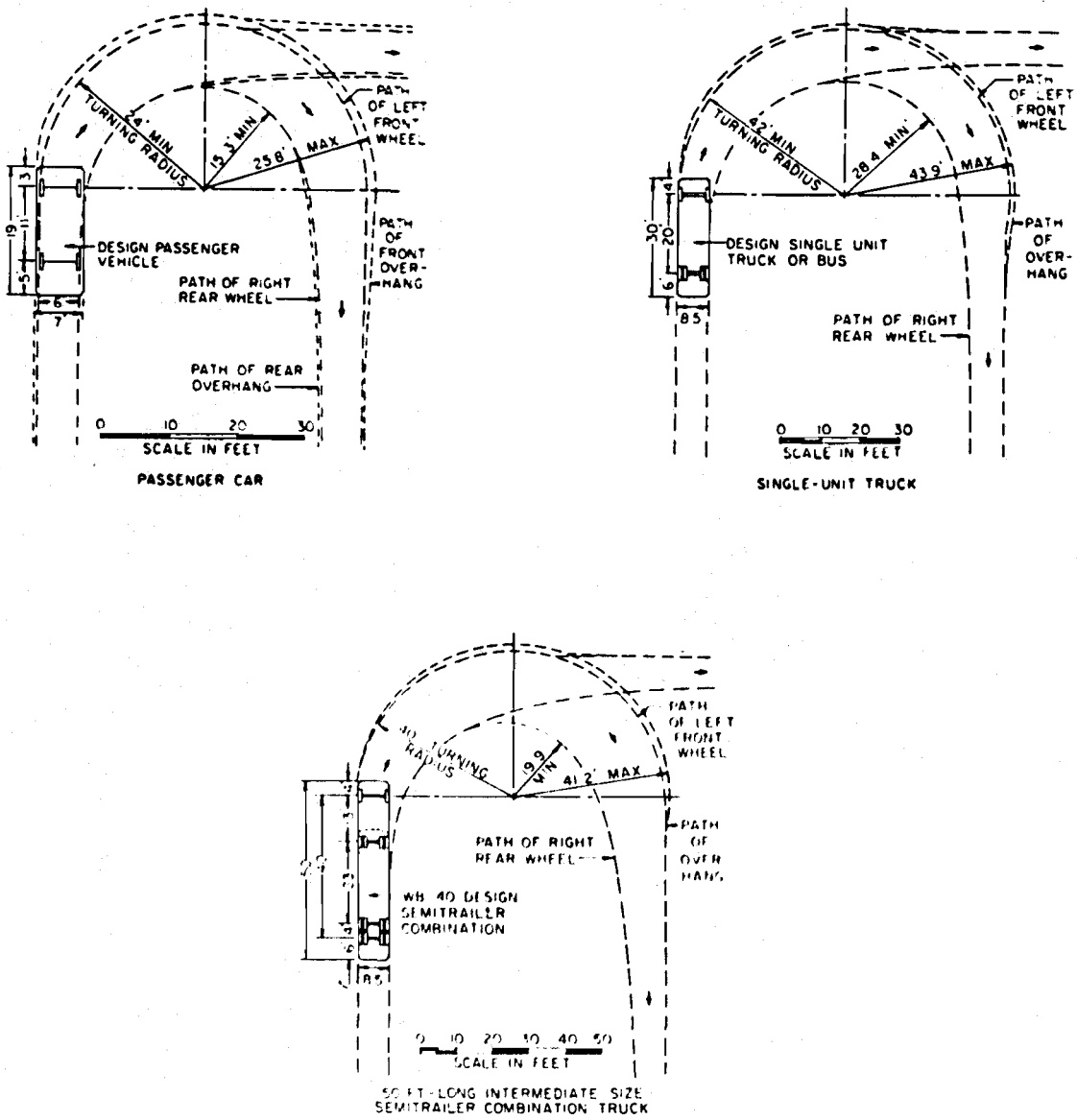
[b]To the path of the left front wheel.

[c]To the path of the right rear wheel.

Source: Homburger, Wolfgang S. (Editor), Transportation and Traffic Engineering Handbook--Second Edition, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1982; and SEWRPC.

Figure 2

TURNING RADII OF SELECTED MOTOR VEHICLES



also assumed that the transfer semitrailer-tractor units would be housed at the public works facility.

AUTOMOBILE PARKING FACILITY DESIGN

Placement of Off-Street Automobile Parking on Lots

Employee off-street parking should not be permitted within the front yard of the public works facility site. However, visitor or patron parking may be permitted in such yards.

Automobile Parking Spaces

Off-street automobile parking stalls should be provided at the public works facility at the rate of 2.5 stalls per each piece of major vehicular equipment being used at the facility; one (1) stall for each administrative employee; and one (1) stall for visitor and patron parking per 1,500 City residents. Off-street automobile parking stalls shall not be less than 180 square feet in area, excluding drives and parking stall access areas. Automobile parking spaces should also be provided for the handicapped pursuant to the requirements of the state building code.

Automobile Parking Lot Drive Width

Automobile parking lot drives should be a minimum of 24 feet wide for two-way traffic and a minimum of 12 feet wide for one-way traffic.

Automobile Parking Lot Surfacing

All off-street automobile parking areas should be graded and surfaced so as to be dust free and properly drained. Automobile parking areas for more than five vehicles should have the aisles and parking spaces clearly marked in order to distinguish between parking stalls and vehicular circulation areas. Recommended minimum dimensions for automobile parking lots are shown in Figure 3.

Automobile Parking Lot Landscaping

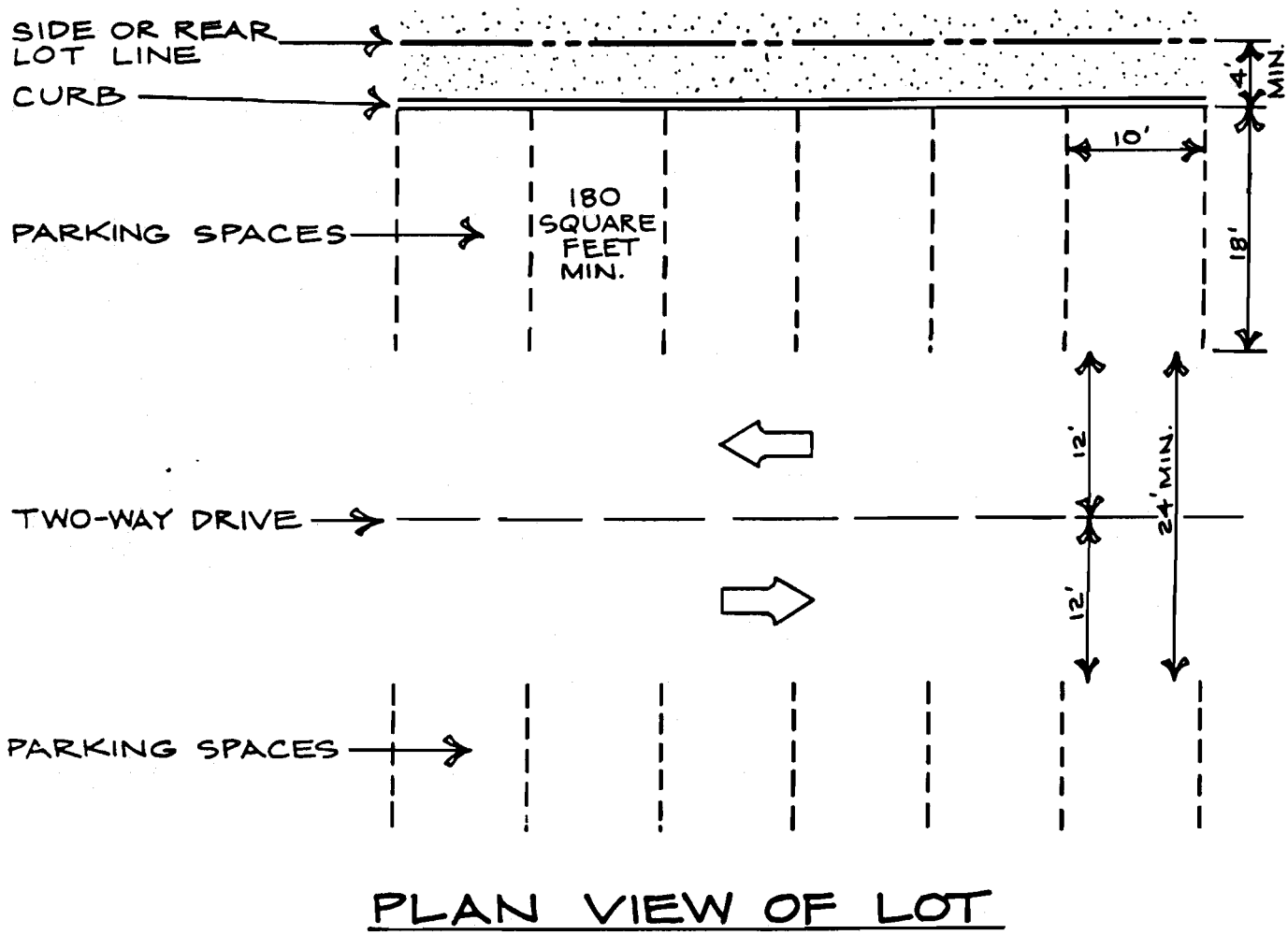
Landscaping should be provided for automobile parking lots. Off-street parking areas which serve five or more vehicles should be provided with accessory landscape areas totaling not less than 5 percent of the surfaced area. Figure 4 illustrates the effective screening of parking lots from neighboring street rights-of-way through the use of plant materials and earth berms. Also, a minimum of one planting island per 10 automobile parking spaces, as shown in Figure 4, should be provided to break up the visual monotony of the parking lot, as well as to add color, texture, interest, scale, and shade. In addition, ground cover, shrubs, and trees should be introduced on the borders of the paved parking areas. Landscaping materials should be placed so as not to interfere with parking lot maintenance, vehicular egress and ingress, and snow removal.

Drive and Parking Lot Lighting

Parking lot lighting should serve four purposes. First, the lighting should facilitate the safe movement of pedestrian and vehicular traffic. Second, it should promote security. Third, it should aid in creating an aesthetically pleasing nighttime environment. Fourth, it should facilitate nighttime use of the facility. Parking areas should be provided with an illumination of about

Figure 3

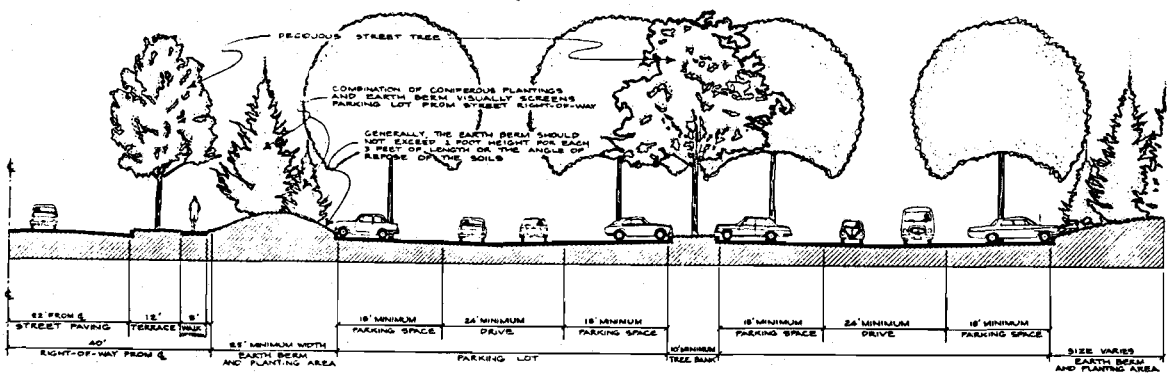
MINIMUM DESIGN DIMENSIONS FOR AUTOMOBILE PARKING LOTS
AT THE PUBLIC WORKS FACILITY



Source: SEWRPC.

Figure 4

LANDSCAPING OF AUTOMOBILE PARKING LOSTS
AT THE PUBLIC WORKS FACILITY



SECTION

Source: SEWRPC.

1.0-foot candle. Drives should be provided with an illumination of about 0.6-foot candle. The illumination should be designed with careful attention to luminaire height, luminaire spacing, transverse location of luminaires, luminaire selection, traffic conflict areas, glare onto adjacent parcels, and transition lighting requirements.

Automobile Parking Lot Location
Automobile parking lots should be so located so as to minimize both employee, visitor, and patron walking distances to the facility which the parking lot is intended to serve.

Onsite Access and Egress Automobile Space
There should be sufficient onsite space to accommodate at least three queued automobiles waiting to enter or exit an automobile parking lot without using any portion of the land access street or collector street upon which the facility fronts or otherwise interfering with street traffic.

TRUCK FACILITY DESIGN

General Truck Access
The distance which trucks travel after entering the facility should be minimized. The length of the service drive entering the lot from land access or collector streets should be at least twice as long as the length of the longest truck, thus allowing for onsite vehicle queuing.

Truck Service Drives
Truck service drives should have a width of at least 12 feet for one-way traffic and 24 feet for two-way traffic. Design cross sections of one-way truck service and two-way truck service drives are illustrated in Figures 5 and 6.

Truck Service Drive Landscaping
Desirable landscaping of truck service drives is shown in Figure 5 and 7. Such landscaping can include an array of plant materials, including trees, shrubs, and ground covers, as well as earthen berms.

Truck Circulation
Onsite truck traffic should generally follow a counterclockwise pattern of flow to enhance visibility, safety, and efficiency.

Truck Entrances/Exits to Buildings
Truck entrances and exits to buildings should be placed and/or screened so as not to be visible from public street rights-of-way and to minimize adverse wind conditions during the winter months.

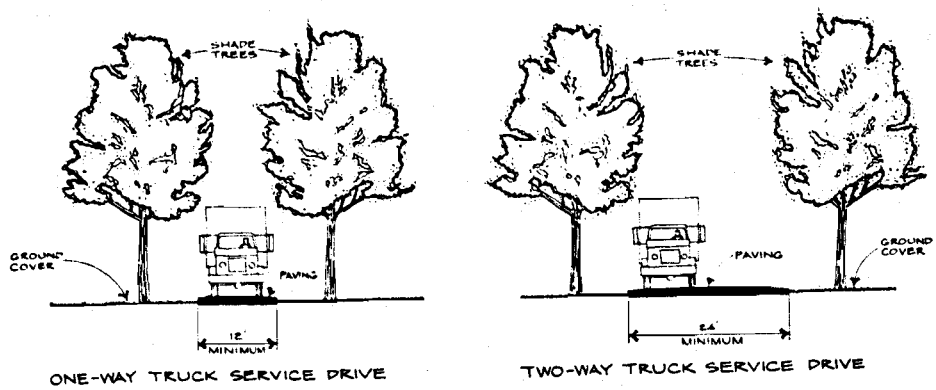
Outside Truck Maintenance-Apron Design at Buildings
Truck apron design should incorporate the minimum design standards set forth in both Table 9 and Figure 8.

EASEMENTS

Utility Cables
Underground locations for all utility lines should be considered, since poles and overhead wires detract from the overall appearance of the facility.

Figure 5

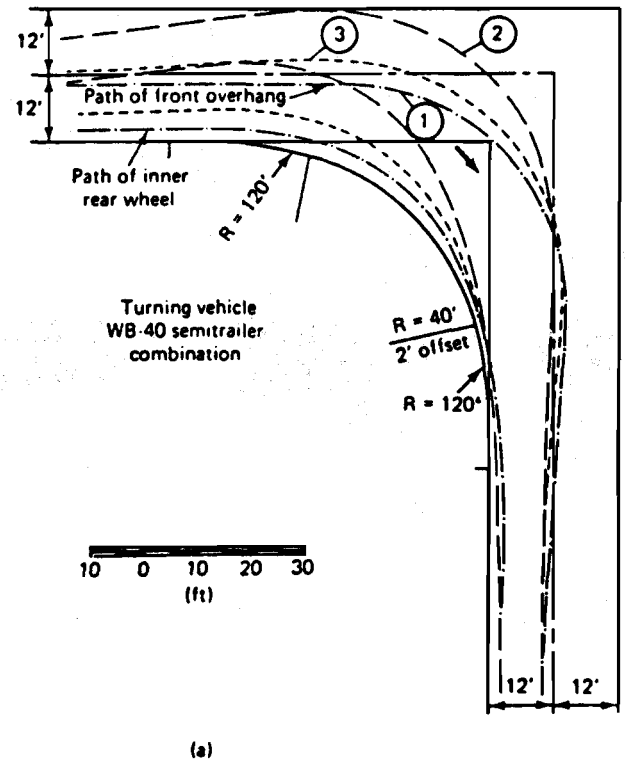
MINIMUM CROSS-SECTION DESIGN OF ONE-WAY AND TWO-WAY TRUCK SERVICE DRIVES FOR THE PUBLIC WORKS FACILITY



Source: SEWRPC.

Figure 6

MINIMUM EDGE-OF-PAVEMENT DESIGN CRITERIA FOR TURNING ROADWAYS

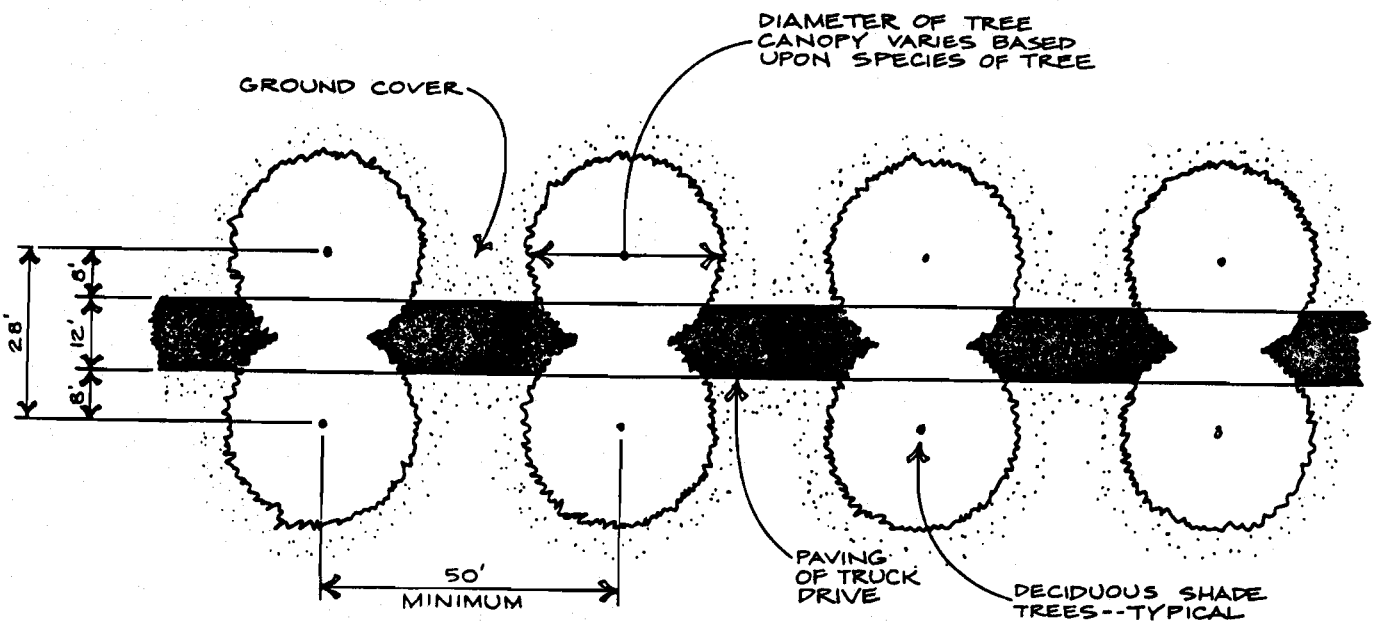


50 FT.-LONG INTERMEDIATE SIZE SEMITRAILER COMBINATION TRUCK

Source: American Association of State Highway Officials, A Policy on Geometric Design of Rural Highways, Washington, D. C., 1965, pp. 314 and 316; and SEWRPC.

Figure 7

SUGGESTED LANDSCAPING OF A TYPICAL TRUCK SERVICE DRIVE AT THE PUBLIC WORKS FACILITY



Source: SEWRPC.

Table 9

RECOMMENDED MINIMUM TRUCK APRON DESIGN STANDARDS AT BUILDINGS

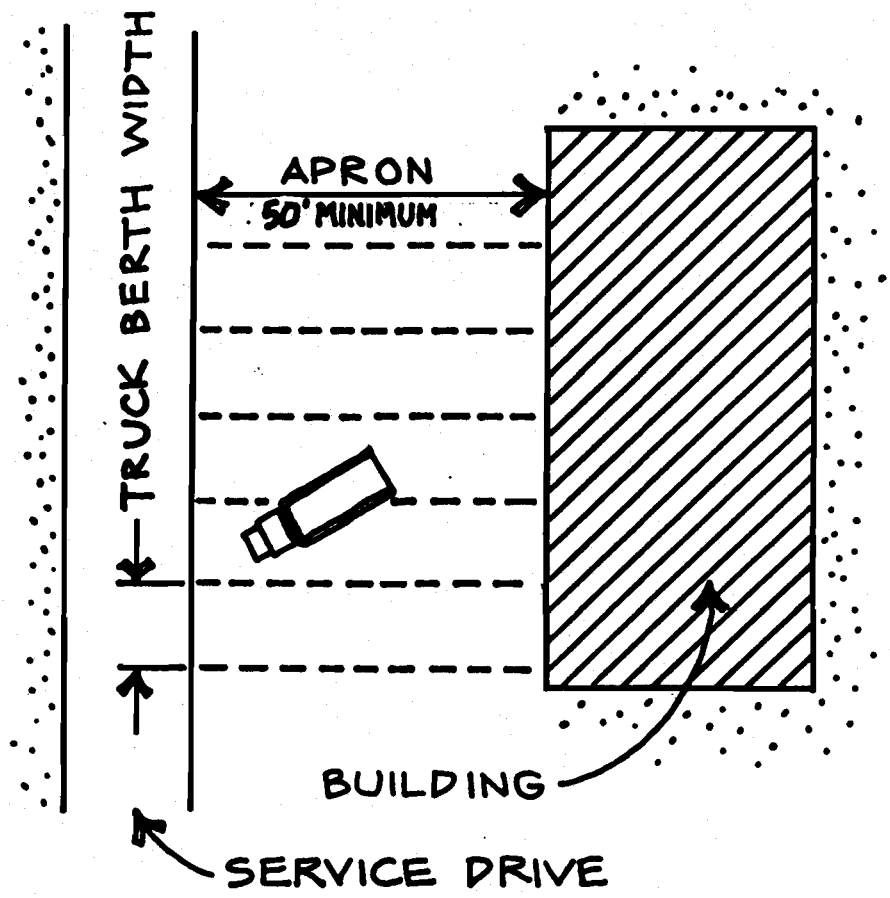
Overall Length of Truck (feet)	Truck Berth Width (feet)	Recommended Truck Apron Length (feet)[a]
40	10	46
	12	43
	14	39
45	10	52
	12	49
	14	46
50	10	60
	12	57
	14	54
55	10	65
	12	62
	14	58
60	10	72
	12	63
	14	60

[a]Note that additional truck apron length may be needed, depending upon the location and design of the service drive, in order to accommodate truck turning movements.

Source: Adapted from R. H. Haskell, "Recommended Yard and Dock Standards, " Transportation and Distribution Management, October 1966, p. 27; and SEWRPC.

Figure 8

ELEMENTS OF TRUCK APRON DESIGN AT BUILDINGS



PLAN VIEW

Source: SEWRPC.

Utility Easements

Utility easements of widths adequate for the intended purpose, but not less than five feet along each side of all rear lot lines and along side lot lines, should be provided for electric power and communication wires and conduits, storm and sanitary sewers, and gas, water, and other utility lines.

Where traversed by a watercourse or drainageway, an easement of adequate width should be provided for drainage purposes.

STORMWATER DRAINAGE AND EROSION/SEDIMENTATION CONTROL

Stormwater drainage facilities may include curbs and gutters, inlets, storm sewers, roadway ditches, culverts, open channels, and water detention and retention basins. The facilities should be of adequate size and grade to hydraulically accommodate the design volumes of flow through, and from within, the development, and should be so designed as to prevent and control soil erosion and sedimentation and to minimize hazards to life or property. Where possible, stormwater drainage should be maintained by landscaped open channels or swales of adequate size and grade.

GENERAL LANDSCAPING OF THE SITE

Areas of Vegetation

Every effort should be made to protect and retain all existing trees, shrubbery, vines, and grasses not actually located in public roadways, drainageways, paths, and trails. Trees should be protected and preserved during construction in accordance with sound conservation practices, including the preservation of trees by use of constructed wells, islands, or retaining walls whenever abutting grades are altered to the extent that existing trees could be damaged.

Soils and Landscape Planting

General landscape guides for the planting and selection of various trees, shrubs, and vines to perform a variety of functions, such as shade, street landscaping, lawn landscaping, hedges, screens, and windbreaks can be found in SEWRPC Planning Report No. 8, Soils of Southeastern Wisconsin.

The landscape guides are based upon soil types found in the Region, and show the various types of trees, shrubs, and vines which can be accommodated for a variety of landscape planting uses. The various soils found in the Region have been grouped into categories termed "woodland suitability groups," based upon their response and suitability to various tree, shrub, and vine species. The woodland suitability groups have been numbered according to a statewide classification system.

Also, landscape planting materials should be selected for use at the public works facility, in part, based upon their tolerance to both sulfur dioxide (SO_2) and de-icing salt.

Street Trees

At least one street tree of an approved species and of at least six feet in height should be planted for each 50 feet of frontage on streets and private

drives. However, the placement and selection of street tree species should not hamper or interfere with access to natural light and air. Tree species should be selected, in part, based upon soil conditions and species hardiness to soil conditions. Columnar varieties of street trees may require shorter distances between plantings.

Wind and Landscape Planting

Landscaping should be done in such a way as to minimize winter wind and promote summer wind effects on structures. Winter wind protection is afforded by planting landscaping, desirably evergreen plant materials, of an adequate height on the west side of structures. However, if sunlight would be blocked, low shrubs should be used to divert or enhance winds. An optimum distance between a winter windbreak and a structure is approximately twice the tree height.

Sunlight and Landscape Planting

With respect to sunlight, landscaping planted to the south of structures should be short, broad, deciduous species with open twig patterns, affording the passage of light through the branch structure in the winter.

Sunlight and Open Space

The location of open space should be such that whenever possible, the open space acts as a buffer between low structures and the shadows cast by neighboring structures or landscape materials. Sunlight should be afforded each building in order to permit potential solar energy use.

Noise and Landscaping Planting

Groups of trees, shrubs, and other masses, such as earth berms, can serve as noise barriers and should be utilized where noise could create problems for neighboring land uses. Such landscaped noise barriers are most effective when the barrier is near the noise source or receiver. Landscape plantings should provide for noise reductions.

Chapter IV

CENTRAL PUBLIC WORKS FACILITY BUILDING AND SITE DEVELOPMENT PROGRAM

INTRODUCTION

Architectural programming is defined as the process leading to the identification of a specific architectural design problem and the determination of the spatial requirements to be met in the solution to that problem. Architectural programming for the needs and spatial requirements of a new central public works facility for the City of New Belin constitutes, in effect, problem definition; while the ultimate architectural design of the building constitutes the solution to the defined problem. Since it is necessary to know the spatial needs and requirements of the City of New Berlin Public Works Department in order to select a site which will meet these needs, a building program was formulated. The program is based, in part, upon the locational and site design criteria set forth in Chapter III, and the equipment needs analysis presented in Chapter II.

CENTRAL PUBLIC WORKS FACILITY FUNCTIONAL SPACES

The architectural building program must identify the functions which the new facility is intended to house. Accordingly, this section presents the space requirements for the facility as a whole, as well as for each of the principal functional areas. The major functional areas of the central public works facility are defined as public works administration, public works vehicle and material storage, street salt storage, public works vehicle maintenance, solid waste facility, and outdoor and site related functional spaces which include off-street automobile and vehicle parking, waste processing facility (chipping, compost, etc.), waste separation and recycling collection facilities, material storage, vehicle queueing, circulation, landscaping, and required setbacks.

PUBLIC WORKS ADMINISTRATION FUNCTIONAL SPACES (BUILDING)

Entrance

A centrally located combined public and employee entrance and vestibule area should act as the transitional space from the outdoors to the administration offices. This entrance should provide for a small waiting area and public coat rack. The area should also be located relatively close to the public restrooms.

Secretary/Receptionist Office

A centrally located area near the entrance should act as the reception area for the administration offices. This area should serve as the initial processing center of incoming calls as well as of onsite visitors to and users of the facilities. Ready access to this space should be afforded both the general public as well as the superintendents and foremen. Suitable office furniture such as desks, chairs, file cabinets, shelves, and coat and supply closets should be provided.

Superintendent Offices
A private office for the Public Works Superintendent should serve as the administrative center of public works activities. A second office, for the Solid Waste Management Superintendent, should serve as the administrative center for solid waste management activities. Suitable office furniture such as desks, chairs, file cabinets, shelves, and coat and supply closets should be provided in each of the two offices. These offices should be easily accessible to both the secretary/receptionist office and the foremen offices.

Foreman Offices
Office space for three public works foremen and two solid waste management foremen should be provided in proximity to the respective superintendent office, secretary/ receptionist office, lunchroom, and locker room. Suitable office furniture such as desks, chairs, file cabinets, shelves, and coat and supply closets should be provided. These offices need not be private in design.

Public Lavatories/Restrooms
Public lavatories and restrooms for both men and women should be provided in accordance with the Wisconsin Building Code.

Lunchroom/Meeting Room
A combination lunchroom and meeting room should be provided with a maximum capacity of 75 seated persons to meet year 2010 personnel needs as well as accommodate any reasonable crowd overflow situations which may occur on occasion. This area is intended to be used both as a lunchroom and general meeting room for public works personnel. The room sould provide for direct access from the outdoors as well as from the secretary/ receptionist area and locker room. A coat rack or closet and table/chair storage area should be provided, as well as a small kitchen unit. The area could also function as an operations center during an emergency.

Locker Rooms
A men's locker room with restroom and showers, and with 70 lockers, should be provided to meet year 2010 needs. In addition, a women's locker room with restroom and showers, and with 15 lockers, should be provided for Phase II of the facility. The locker rooms should, however, be designed to provide for adequate flexibility to accommodate varying mixes of sexes in the work force.

Janitor Closet
Space for a janitor's closet, including equipment storage and mop sink, with access from the outdoors should be provided.

Mechanical Equipment Room
A mechanical equipment room may be necessary for heating, ventilating, air conditioning, and water heating equipment, depending upon the type of mechanical systems selected for the building. Public works needs may also dictate special back-up electrical systems in case of power failure.

PUBLIC WORKS VEHICLE AND MATERIAL STORAGE FUNCTIONAL SPACES (BUILDING)

Vehicle Storage Garage
The vehicle storage garage should house all of the City public works-related equipment. Through its size, layout, and location on the site, the vehicle

storage garage should facilitate vehicular circulation, allowing for good vehicular flow both to and from the building, thus minimizing conflicts with other public works-related functional areas. Desirably, the building should be able to be readily expanded to meet needs beyond the design year 2010. In addition, ample space should be provided around each vehicle to permit good access to the vehicles.

Street Barricade Storage
Adequate space should be provided, separate from stored vehicles, for the storage of street barricades and associated equipment.

Christmas Street Decoration Storage
Adequate space should be provided, separate and enclosed from stored vehicles, for the storage of seasonal Christmas and other holiday street decorations.

Outdoor Material Storage
See discussion of outdoor and site-related functional spaces requirements.

Restrooms
Lavatories and restrooms for both men and women should be provided in accordance with the Wisconsin Building Code.

Janitor Closet
Space for a janitor's closet, including equipment storage and mop sink, with access to the outdoors should be provided.

Mechanical Equipment Room
A mechanical equipment room may be necessary for heating, ventilating, and water heating, depending upon the type of mechanical systems selected for the building. Public works needs may dictate special back-up electrical systems in case of power failure.

STREET SALT STORAGE SHED FUNCTIONAL SPACE (BUILDING)

An enclosed highway "salt" and "salt/sand mix" storage facility is required by state law. This type of facility is typically a dome-shaped or rectilinear-shaped structure which houses all the chemicals and sand used for snow and ice control by the Street Department. Storage space in this facility should accommodate about nine tons of ice control material per linear mile of street to be maintained. The space should be adequate in size to accommodate both salt and sand storage as well as the mixing process.

PUBLIC WORKS VEHICLE MAINTENANCE FUNCTIONAL SPACES (BUILDING)

Truck Repair Bay Area
Sufficient space is needed in Phase I of the building program to provide for two truck repair bays. Phase II would require an additional two truck repair bays if the solid waste collection and transportation services facility is constructed. These bays could also be used for automobile repair work.

Truck Wheel Alignment Bay Area
One truck wheel alignment bay should be provided at the facility.

Automobile Wheel Alignment Bay Area
One automobile wheel alignment bay should be provided in the facility.

Vehicle Wash Bay Area
Adequate space should be provided at the facility for the enclosed automated washing of public works and solid waste collection vehicles. One such bay area should be provided to house one such automatic washing machine.

Parts and Tool Room
Adequate space should be provided for the storage and security of repair tools and vehicle parts.

Sign Construction Workroom
Adequate space should be provided at the facility for the construction of traffic and other street and highway signs.

Sand Blasting and Vehicle Painting Area
Adequate space should be provided at the facility for the sand blasting and painting of vehicles.

Paint Storage Room
All paints and flammable materials should be stored in a paint storage locker pursuant to the Wisconsin Building Code.

General Storage Room
A general storage room should be provided for the storage of any miscellaneous public works- or solid waste disposal-related equipment or materials.

Restrooms
Lavatories and restrooms for both men and women should be provided in accordance with the Wisconsin Building Code.

Janitor Closet
Space for a janitor's closet, including equipment storage and mop sink, with access from the outdoors should be provided.

Mechanical Equipment Room
A mechanical equipment room may be necessary for heating, ventilating, and water heating equipment, depending upon the type of mechanical system selected for the building. Public works needs may dictate special back-up electrical systems in case of power failure.

SOLID WASTE FACILITY FUNCTIONAL SPACES

For the purposes of this study, solid waste facility means a facility for storing solid waste collection and transportation vehicles and equipment, transfer facility, processing facility, and waste separation and recycling facilities.

Solid Waste Collection and Transportation Services Area (Building)
An enclosed building should be provided to house all solid waste collection and transportation vehicles and related equipment. Through its size, layout, and location, the area should allow for good vehicular flow both to and from the building, minimizing conflicts with other public works-related functional

areas. Desirably, the building should be able to be expanded as new equipment is acquired beyond the year 2010 building program period. Ample space should be provided around each vehicle to permit adequate user access to the vehicles.

Restrooms: Lavatories and restrooms for both men and women should be provided in accordance with the Wisconsin Building Code.

Janitor Closet: Space for a janitor's closet, including equipment storage and mop sink, with access from the outdoors, should be provided.

Mechanical Equipment Room: A mechanical equipment room may be necessary for heating, ventilating, and water heating equipment, depending upon the type of mechanical systems selected for the building. Facility needs may also dictate special back-up electrical systems in case of power failure.

Transfer Facility (Building)
The transfer facility is a solid waste disposal site or facility at which the transfer of solid waste from one vehicle or container to another, generally of larger capacity, occurs prior to transporting to the point of disposal. A transfer facility is thus a location at which the temporary storage and transfer of the waste may take place. The purpose of transferring wastes from smaller to larger vehicles is to reduce the cost of the transportation function; this is generally done by not utilizing the collection crew and equipment for transport. In the transfer operation, vehicles normally used are large capacity trucks. The popularity of truck transfer systems has led to the development of equipment specifically suited to this purpose. Two basic types of transfer systems have developed. The first is the direct-dump system where a collection truck or individuals dump by gravity into a large open-top trailer or container. The second basic transfer system utilizes transfer to a container equipped to provide pressurized horizontal compaction of the waste. Two basic types of trucks that may be used following transfer are the open top trailer and the compacted load trailer. Other options include transport of open or enclosed containers with compactors used to receive wastes at the transfer stations. Trucks designed with hoisting or pulling mechanisms are used to transport these containers.

Solid Waste Storage Room: Solid waste storage means the holding of solid waste for a temporary period, at the end of which period the solid waste is to be treated or disposed of. The primary purpose of the storage function is to accumulate a sufficient quantity of solid waste for subsequent economical collection and transport.

The solid waste storage room should accommodate both containerized and noncontainerized facilities. A containerized facility is a mechanical or nonmechanical storage container, site, or facility designed and operated for storage and containment of solid waste. A noncontainerized storage facility is a site or facility designed and operated for storage of solid waste, generally in volumes too large for containerized storage.

Restroom: Since the transfer facility will accommodate fewer than 10 employees at one time, a single, shared restroom should be provided, pursuant to the Wisconsin Building Code.

Janitor Closet: Space for a janitor's closet, including equipment storage and mop sink, with access from the outdoors shall be provided.

Mechanical Equipment Room: A mechanical equipment room may be necessary for heating and ventilating and water heating, depending upon the type of mechanical systems selected for the building. Facility needs may also dictate special back-up electrical systems in case of power failure.

Processing Facility (Outdoor)
The processing facility, for the purposes of this study, is that area used to chip, densify, composte, classify, separate, or otherwise alter solid wastes by some means in order to facilitate further transfer, processing, utilization, or disposal. Processing is used to improve the efficiency of subsequent solid waste management functions by reducing storage requirements and hauling costs. It was assumed that chipping and composting would be the only methods of waste processing carried on at the site during the facility program period.

Chipping Area: A chipping area for a chipping machine should be provided for the densification and volume reduction of tree branches and similar materials.

Composting Windrows: Composting windrow areas should be provided at the site for biological degradation of vegetative solid waste for conversion into a nuisance free, humus-like material that can be used as a soil conditioner.

Restroom: Lavatory and restroom facilities for the processing facility should be located at the solid waste collection and transportation services area or at the transfer facility.

Waste Separation and Recycling Collection Facilities (Outdoor)
Waste separation can be defined as the division of solid wastes into recoverable and nonrecoverable fractions by segregating one or more materials--such as paper, glass, or cans--from the refuse. For the purposes of this study, the term waste separation is defined to include the subsequent steps needed to collect and store the separatd recyclable materials. The two principal purposes of waste separation are: 1) the recovery and reuse of recyclable materials; and 2) the reduction in the amount of solid waste which must otherwise be disposed of. The waste separation and recyclying collection facility should be designed to collect and store paper, glass, plastic, aluminum, metal, and waste oils.

Waste Oil Collection and Recycling Area: Waste oil means any used oil or oil which is contaminated through storage or handling before that oil is recycled. Adequate waste oil storage facilities are required by State Statute. These facilities may also serve as an engine waste oil collection facility and an engine waste oil storage facility. Engine waste oil means used automotive engine oil after it is removed from the engine or crankcase of a motor vehicle, but before that oil is recycled. The waste oil storage facility should have a minimum capacity of 250 gallons.

Waste Separation Bin Area: The area which provides for the location of separate waste collection bins for newsprint, aluminum, glass, and plastic.

OUTDOOR AND SITE RELATED FUNCTIONAL SPACES

Buildings
The central public works facility site should provide sufficient site area for buildings which house the functions of public works administration, public works vehicle and material storage, street salt storage, public works vehicle maintenance, solid waste collection and transportation service area, and transfer facility.

Off-Street Automobile Parking
Off-street automobile parking should be provided at the site for all employees and visitors.

Vehicular Equipment Outdoor Storage
Adequate vehicular equipment outdoor storage and vehicle apron areas should be provided for all truck-sized vehicles housed in both the public works vehicle and material storage and solid waste collection and transportation service areas.

Processing Facility
A waste processing facility should be provided at the site with adequate space to accommodate the composting of material and chipping of tree branches.

Waste Separation and Recycling Collection Facilities
Waste separation and recycling collection facilities should be provided at the site. These facilities should provide adequate space for an automobile drive-thru and unloading area, aluminum recycling area, glass recycling area, paper recycling area, plastic recycling area, tin recycling area, and waste oil collection and recycling area.

Outdoor Transfer Facility Vehicle Queuing
Adequate onsite space should be provided near the transfer facility building for the queuing of solid waste collection vehicles waiting to use the facility.

Outdoor Material Storage
Adequate onsite space should be provided for the outdoor storage of public works construction-related materials such as concrete planks, endwalls and culverts, gravel storage, sand storage, stone storage, and topsoil and dirt storage.

Circulation, Landscaping, and Setbacks
Adequate space at the site should be allowed for circulation, landscaping and open space, and a 100-foot wide setback on all sides of the public works facility area.

THE CENTRAL PUBLIC WORKS FACILITY BUILDING AND SITE DEVELOPMENT PROGRAM

The proper allocation of space for each activity to be performed at the facility will, to a large degree, determine the efficiency of the final facility design. The user needs must be translated into square foot areas of space required at the facility. This is accomplished by using standards for space requirements that have been established over the years, including standards

set forth in building codes, as well as the specialized standards and design criteria established and presented in Chapter III.

One of the important functions of an architectural building program is to provide a consolidated listing of all the building facility requirements believed necessary to serve the forecast spatial needs to specified facility design years, in this case, the years 2000 and 2010. The definition of building space program forms the basis for determining land and site requirements, as well as for preparing detailed cost and budget estimates for the construction of the facilities as presented in Chapter VII.

The building program outlined herein consists of two phases of construction. Phase I construction, as defined in Table 10, would accommodate the 2000 spatial needs of a new public works facility. Phase II construction, also defined in Table 10, would accommodate the additional space needs of the design year 2010 at the same site.

INTERRELATIONSHIP OF THE FUNCTIONAL SPACES OF THE CENTRAL PUBLIC WORKS FACILITY

Building programs should clearly indicate which spaces need to be interrelated with other required spaces at the facility. This is of special importance for the building program for the central public works facility, since four primary functional areas have been identified: 1) public works administration; 2) public work vehicle and material storage; 3) public works vehicle maintenance; and 4) solid waste facility. Each of these four primary functional areas, in turn, have secondary functional spaces associated with them. Figures 9 through 13 define the interrelationships which should exist between the primary functional spaces of the facility (Figure 9) and between the spaces located within each of the four secondary functional spaces (Figures 10 through 13). Figure 14 illustrates the major spatial relationships of site-related functional spaces of the public works facility. The ultimate building and site design for the facility should be based, in part, upon these necessary relationships as well as spatial area requirements defined in Table 10.

Table 10

THE BUILDING AND SITE DEVELOPMENT PROGRAM

Public Works Administration Building Area			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
A. Entrance			
Vestibule	75	0	75
Waiting Area	75	0	75
Coat Rack	15	0	15
Drinking Fountain(s)	20	0	20
Public Telephone	10	0	10
Subtotal	195	0	195
B. Secretary/Receptionist Office			
Office	100	0	100
Coat Closet	10	0	10
Supply Closet	30	0	30
Subtotal	140	0	140
C. Public Works Superintendent Office			
Office	90	0	90
Coat Closet	10	0	10
Supply Closet	15	0	15
Subtotal	115	0	115
D. Solid Waste Superintendent Office			
Office	90	0	90
Coat Closet	10	0	10
Supply Closet	15	0	15
Subtotal	115	0	115
E. Public Works Foreman Office (to serve three foremen)			
Office	225	0	225
Coat Closet	10	0	10
Supply Closet	15	0	15
Subtotal	250	0	250
F. Solid Waste Foremen Offices (to serve two foremen)			
Office	150	0	150
Coat Closet	10	0	10
Supply Closet	15	0	15
Subtotal	175	0	175
G. Public Lavatories-Restrooms (not for employees)			
Private Restroom With One Water Closet and One Lavatory	75	0	75
Subtotal	75	0	75
H. Lunchroom/Meeting Room			
The combined lunchroom and meeting room should provide for a maximum of 75 persons, providing 20 square feet per person; the room should have access from outdoors	1,500	0	1,500
Coat Rack-Closet	40	0	40
Table-Chair Storage	50	0	50
Kitchen Unit	25	0	25
Subtotal	1,615	0	1,615

-continued-

Table 10 (cont.)

Public Works Administration Building Area			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
I. Locker Rooms (two required)			
Women:			
Locker Room for 15 Lockers	625	0	625
Lavatory-Restroom with One Water Closet and One Lavatory	75	0	75
Showers (two)	70	0	70
Drinking Fountain	10	0	10
Men:			
Locker Room for 70 Lockers	750	0	750
Lavatory-Restroom With Two Water Closets, Two Urinal, and Two Lavatories	150	0	150
Showers (seven)	245	0	245
Drinking Fountain	10	0	10
Subtotal	1,935	0	1,935
J. Janitor Closet	50	0	50
Subtotal	50	0	50
K. Mechanical Equipment	300	0	300
Subtotal	300	0	300
L. Unassigned Space			
Unassigned Circulation	2,000	0	2,000
Walls, Partitions, Structure	700	0	700
Subtotal	2,700	0	2,700
Total Gross Building Space Needed	7,665	0	7,665

Public Works Vehicle and Material Storage Building Area			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
A. Vehicle Storage Garage			
Truck-sized vehicular spaces (bay area of 14 feet x 35 feet = 490 square feet each and 300 feet each for circulation). There are 47 such vehicles planned for the year 2000, and 54 for the year 2010	37,130	5,530	42,660
Automobile-sized vehicular spaces (bay area of 10 feet x 20 feet = 200 square feet each and 130 square feet each for circulation). There are 22 such vehicles planned for the year 2000 and 24 for the year 2010	7,920	0	7,920
Small equipment space (bay area of 10 feet x 15 feet = 150 square feet each and 70 square feet each for circulation). There are 11 such pieces planned for the years 2000 and 2010	2,420	0	2,420
Subtotal	47,470	5,530	53,000
B. Street Barricade Storage	600	0	600
Subtotal	600	0	600
C. Christmas Street Decoration Storage	600	0	600
Subtotal	600	0	600

-continued-

Table 10 (cont.)

Public Works Vehicle and Material Storage Building Area			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
D. Lavatories-Restrooms (for employees)			
Women:			
Three water closets and two lavatories.....	135	0	135
Men:			
Two water closets, one urinal, and two lavatories.....	135	0	135
Drinking fountain.....	10	0	10
Subtotal	280	0	280
E. Janitor Closet.....	50	0	50
Subtotal	50	0	50
F. Mechanical Equipment			
(Note: vehicle storage garage to be served by ceiling-hung units for heating).....	90	0	90
Subtotal	90	0	90
Total Gross Building Space Needed	49,090	0	54,620

Street Salt Storage Shed Building Area			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
A. Enclosed Street Salt/Sand Storage Shed			
(to accommodate 2,000 tons of salt and sand mix in the year 2000 and 2,200 in the year 2010.....	4,500	500	5,000
Subtotal	4,500	500	5,000
Total Gross Building Space Needed	4,500	500	5,000

Public Works Vehicle Maintenance Building Area			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
A. Truck Repair Bays Area			
Space for two bays to be provided for year 2000 needs and two additional bays to be provided for year 2010 needs. Each bay is 14 feet x 35 feet = 490 square feet and 300 square feet each for circulation.....	1,580	1,580	3,160
Subtotal	1,580	1,580	3,160
B. Truck Wheel Alignment Bay Area			
One bay size of 14 feet x 35 feet = 490 square feet and 300 square feet for circulation.....	790	0	790
Subtotal	790	0	790
C. Automobile Wheel Alignment Bay Area			
One bay size of 14 feet x 20 feet = 280 square feet and 350 square feet for circulation.....	630	0	630
Subtotal	630	0	630

-continued-

Table 10 (cont.)

Public Works Vehicle Maintenance Building Area			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
D. Vehicle Wash Bay Area (automated)			
One bay at 800 square feet and 400 square feet for circulation	2,400	0	2,400
Subtotal	2,400	0	2,400
E. Parts and Tool Room	600	0	600
Subtotal	600	0	600
F. Sign Construction Workroom	900	0	900
Subtotal	900	0	900
G. Sand Blasting and Vehicle Painting Area	1,100	0	1,100
Subtotal	1,100	0	1,100
H. Paint Storage Room	475	0	475
Subtotal	475	0	475
I. General Storage Room	600	0	600
Subtotal	600	0	600
J. Lavatories-Restrooms (for employees)			
Women:			
One water closet and one lavatory	75	0	75
Men:			
One water closet and one lavatory	75	0	75
Drinking fountain	10	0	10
Subtotal	160	0	160
K. Janitor Closet	50	0	50
Subtotal	50	0	50
L. Mechanical Equipment			
(Note: facility to be served by ceiling-hung units for heating)	90	0	90
Subtotal	90	0	90
Total Gross Building Space Needed	9,375	1,580	10,955

Solid Waste Collection and Transportation Services Building			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
A. Solid Waste Collection and Transportation Services Area			
Garbage collection-sized vehicular spaces (bay area of 14 feet x 35 feet = 490 square feet and 300 square feet each for circulation). There are 13 such vehicles planned for the year 2010	0	10,270	10,270
Solid waste transfer vehicle spaces (bay area of 14 feet x 60 feet = 840 square feet and 400 square feet each for circulation). There are two such vehicles planned for the year 2010	0	2,480	2,480
Automobile-sized vehicular spaces (bay area of 10 feet x 20 feet = 200 square feet each and 130 square feet each for circulation). There are three such vehicles planned for the year 2010	0	990	990
Subtotal	0	13,740	13,740

-continued-

Table 10 (cont.)

Solid Waste Collection and Transportation Services Building Area			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
B. Lavatories-Restrooms (for employees)			
Women:			
One water closet and one lavatory	0	75	75
Men:			
One water closet and one lavatory	0	75	75
Drinking fountain	0	10	10
Subtotal	0	160	160
C. Janitor Closet	0	50	50
Subtotal	0	50	50
D. Mechanical Equipment			
(Note: facility to be served by ceiling-hung units for heating)	0	90	90
Subtotal	0	90	90
Total Gross Building Space Needed	0	14,040	14,040

Transfer Facility Building			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
A. Solid Waste Storage Room			
(Assuming a 50 foot x 70 foot building)	0	3,500	3,500
Subtotal	0	3,500	3,500
B. Lavatory-Restroom			
Private restroom with one water closet and one lavatory	0	75	75
Subtotal	0	75	75
C. Janitor Closet	0	50	50
Subtotal	0	50	50
D. Mechanical Equipment Room			
(Note: depends upon type of mechanical systems selected)	0	100	100
Subtotal	0	100	100
Total Gross Building Space Needed	0	3,725	3,725

Site Requirements			
Functional Area	Phase I (square feet)	Phase II (square feet)	Total (square feet)
A. Building Areas			
Public Works Administration	7,665	0	7,665
Public Works Vehicle and Material Storage	47,470	5,530	53,000
Street Salt Storage Shed(s)	4,500	500	5,000
Public Works Vehicle Maintenance	9,375	1,580	10,955
Solid Waste Collection and Transportation Service Area	0	14,040	14,040
Transfer Facility	0	3,725	3,725
Subtotal	69,010	25,375	94,385

-continued-

Table 10(cont.)

Functional Area	Site Requirements: Phase I (square feet)	Phase II (square feet)	Total (square feet)
B. Off-Street Automobile Parking Areas			
Visitor Automobile Off-Street Parking: (for Phase I, 20 automobiles; for Phase II, an additional 10 automobiles for a total of 30 automobiles. Each automobile to have 375 square feet, including circulation space).....	7,500	3,750	11,250
Public Works and Administrative Employee Off-Street Parking: (for Phase I, 60 automobiles; for Phase II, an additional 15 automobiles, for a total of 75 automobiles. Each automobile to have 375 square feet, including circulation space).....	22,500	5,625	28,125
Solid Waste Employee Off-Street Parking (none for Phase I; for Phase II, 20 automobiles. Each automobile to have 375 square feet, including circulation space).....	0	7,500	7,500
Subtotal	30,000	16,875	46,875
C. Off-Street Vehicular Equipment Storage and Service Areas			
Public Works Vehicle Outdoor Storage: (for Phase I, 50 vehicles; for Phase II, an additional 5 vehicles for a total of 55 vehicles. Each vehicle to have 1,300 square feet including circulation space and typically measuring 12 feet x 50 feet per truck berth).....	65,000	6,500	71,500
Garbage Truck Outdoor Storage: (none for Phase I; for Phase II, 13 vehicles. Each vehicle to have 1,300 square feet, including circulation space and typically measuring 12 feet x 50 feet per truck berth).....	0	16,900	16,900
Public Works Vehicle Apron Areas (assuming that apron area is provided for about 50 percent of the truck-sized vehicles in the fleet for both Phase I and Phase II; Phase II apron area provided for an additional two vehicles. Apron space is provided at the rate of 14 feet x 50 feet areas, or 700 square feet, per vehicle).....	17,500	1,400	18,900
Garbage Truck Apron Areas (No apron area provided for Phase I; assuming that apron area is provided for 50 percent of the vehicles in the fleet for Phase II; Phase II apron area provided for seven trucks. Apron space is provided at the rate of 14 foot x 50 foot areas, or 700 square feet per vehicle).....	0	4,900	4,900
Gas Pump Area (for six pumps).....	4,500	0	4,500
Subtotal	87,000	29,700	116,700
D. Processing Facility			
Automobile drive-thru and unloading area.....	1,000	0	1,000
Chipping area.....	500	0	500
Composting area: (assuming maximum height of 6 feet and maximum width per windrow of 12 feet).....	10,000	0	10,000
Communications area.....	25	0	25
Fire equipment area.....	25	0	25
Restrooms: (restroom facilities to be provided at the public works administration facility or by portable toilet facilities).....	0	0	0
Subtotal	11,550	0	11,550

-continued-

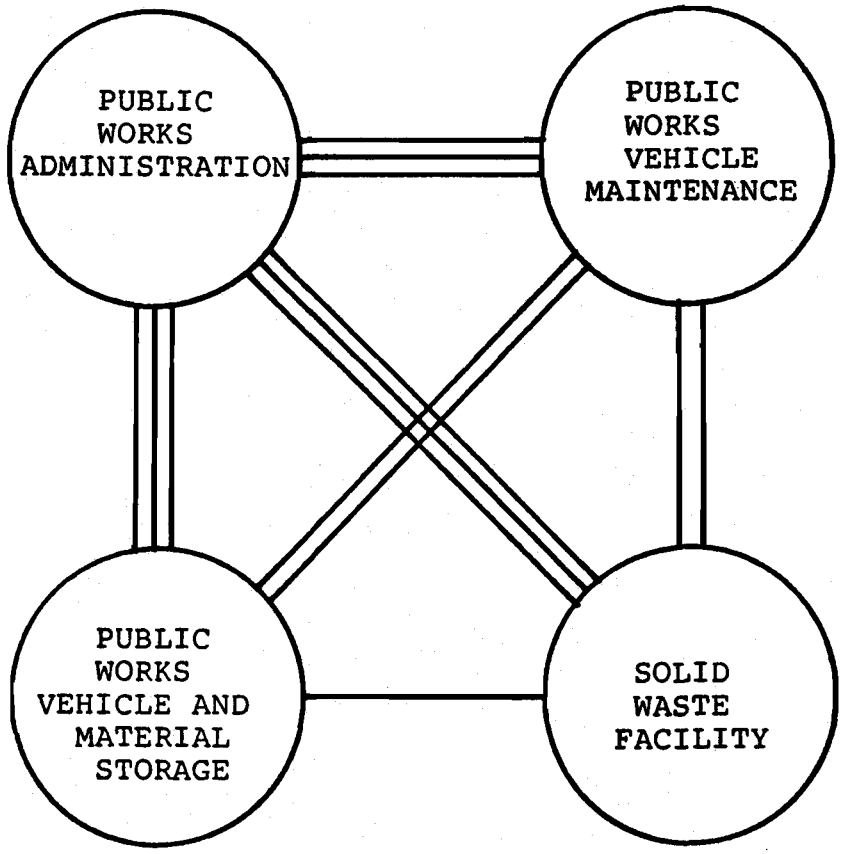
Table 10 (cont.)

Functional Area	Site Requirements: Phase I (square feet)	Phase II (square feet)	Total (square feet)
E. Waste Separation and Recycling Collection Facilities			
Automobile drive-thru and unloading area	1,500	0	1,500
Aluminum recycling area	2,250	0	2,250
Glass recycling area	2,250	0	2,250
Paper recycling area	3,375	0	3,375
Plastic recycling area	2,250	0	2,250
Tin recycling area	2,250	0	2,250
Waste oil collection and recycling area (minimum storage capacity of two 250 gallon storage tanks)	1,125	0	1,125
Restrooms (restroom facilities to be provided at the public works administration facility or by portable toilet facilities)	0	0	0
Subtotal	15,000	0	15,000
F. Outdoor Transfer Facility Vehicle Queueing (space for five trucks at 12 foot x 50 foot space, or 600 square feet per truck)	0	3,000	3,000
Subtotal	0	3,000	3,000
G. Outdoor Material Storage			
Concrete plank storage	10,000	0	10,000
Endwall and culvert storage	10,000	0	10,000
Gravel storage (10 piles)	30,000	0	30,000
Sand storage fof snow/ice control (1 pile)	3,000	0	3,000
Stone storage (4 piles)	12,000	0	12,000
Topsoil and dirt storage (2 piles)	6,000	0	6,000
Subtotal	71,000	0	71,000
H. Circulation, Landscaping, and Setbacks			
Circulation including drives (assume 15 percent of site coverage)	42,875	11,440	54,315
Landscaping and open space (excluding required 100 foot setback and assuming 10 percent of site coverage, including drives)	32,870	8,770	41,640
Setback (required 100 feet on all sides of the public works facility area)	310,700	0	310,700
Subtotal	386,445	20,210	406,655
Total Gross Site Area Needed	670,005 (15.4 acres)	95,160 (2.2 acres)	765,165 (17.6 acres)

Source: SEWRPC.

Figure 9

SPATIAL RELATIONSHIPS OF THE FOUR PRIMARY
FUNCTIONAL SPACES OF THE CENTRAL PUBLIC WORKS FACILITY



= STRONG RELATIONSHIP BETWEEN FUNCTIONAL SPACES

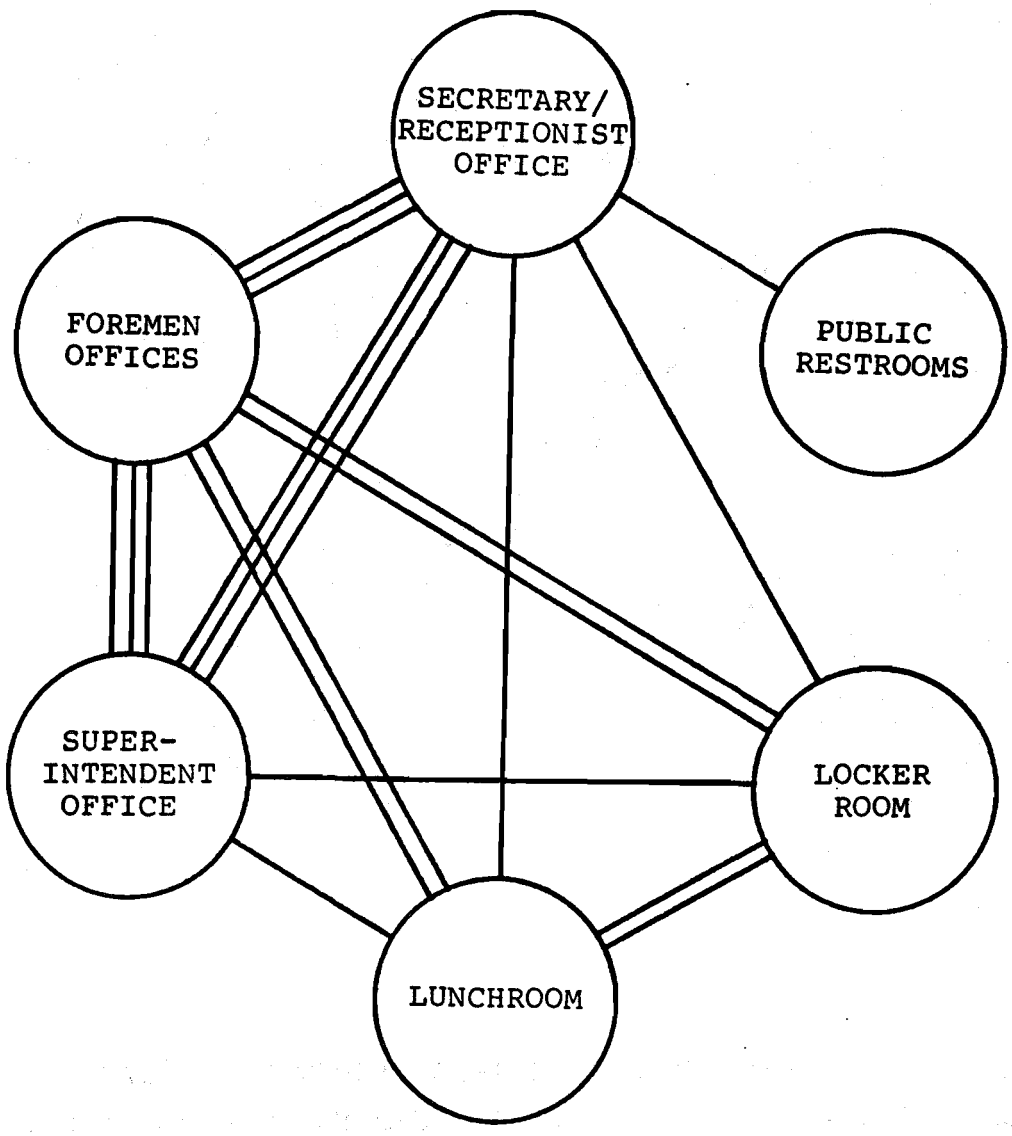
= MODERATE RELATIONSHIP BETWEEN FUNCTIONAL SPACES

= WEAK RELATIONSHIP BETWEEN FUNCTIONAL SPACES

Source: SEWRPC

Figure 10

MAJOR SPATIAL RELATIONSHIPS WITHIN
THE PUBLIC WORKS ADMINISTRATION AREA



= STRONG RELATIONSHIP BETWEEN FUNCTIONAL SPACES

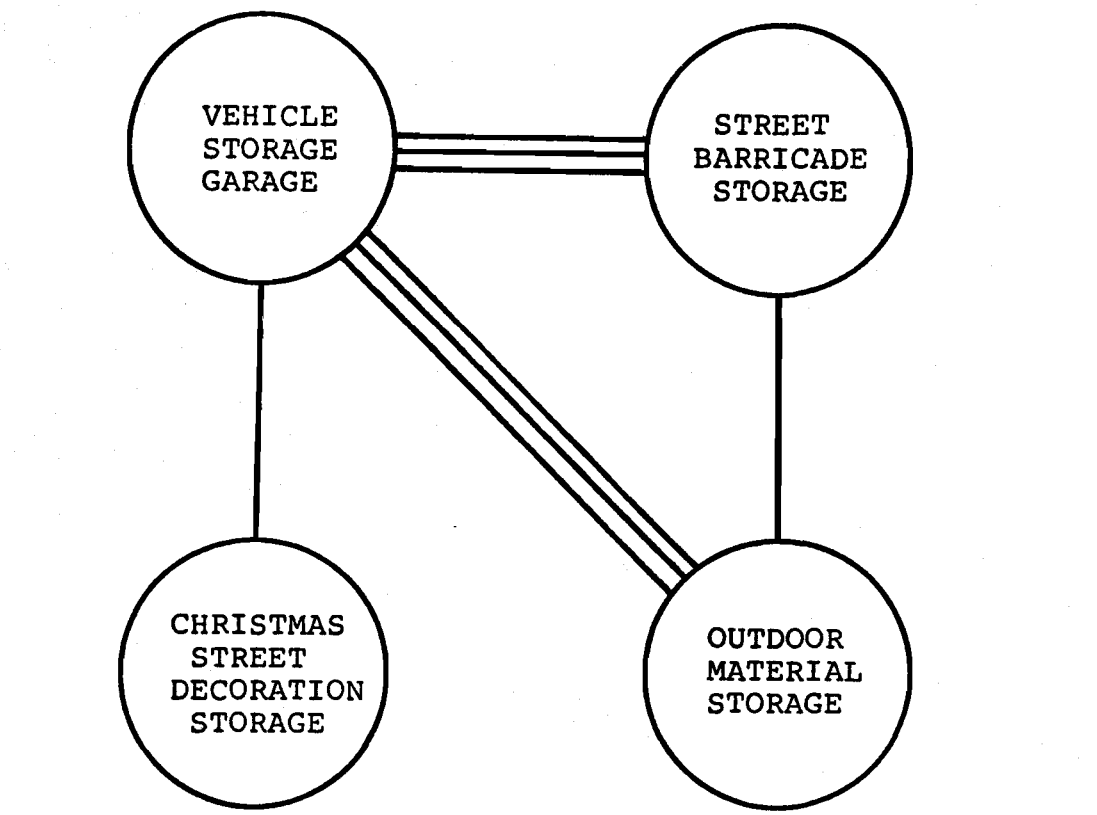
= MODERATE RELATIONSHIP BETWEEN FUNCTIONAL SPACES

= WEAK RELATIONSHIP BETWEEN FUNCTIONAL SPACES

Source: SEWRPC.

Figure 11

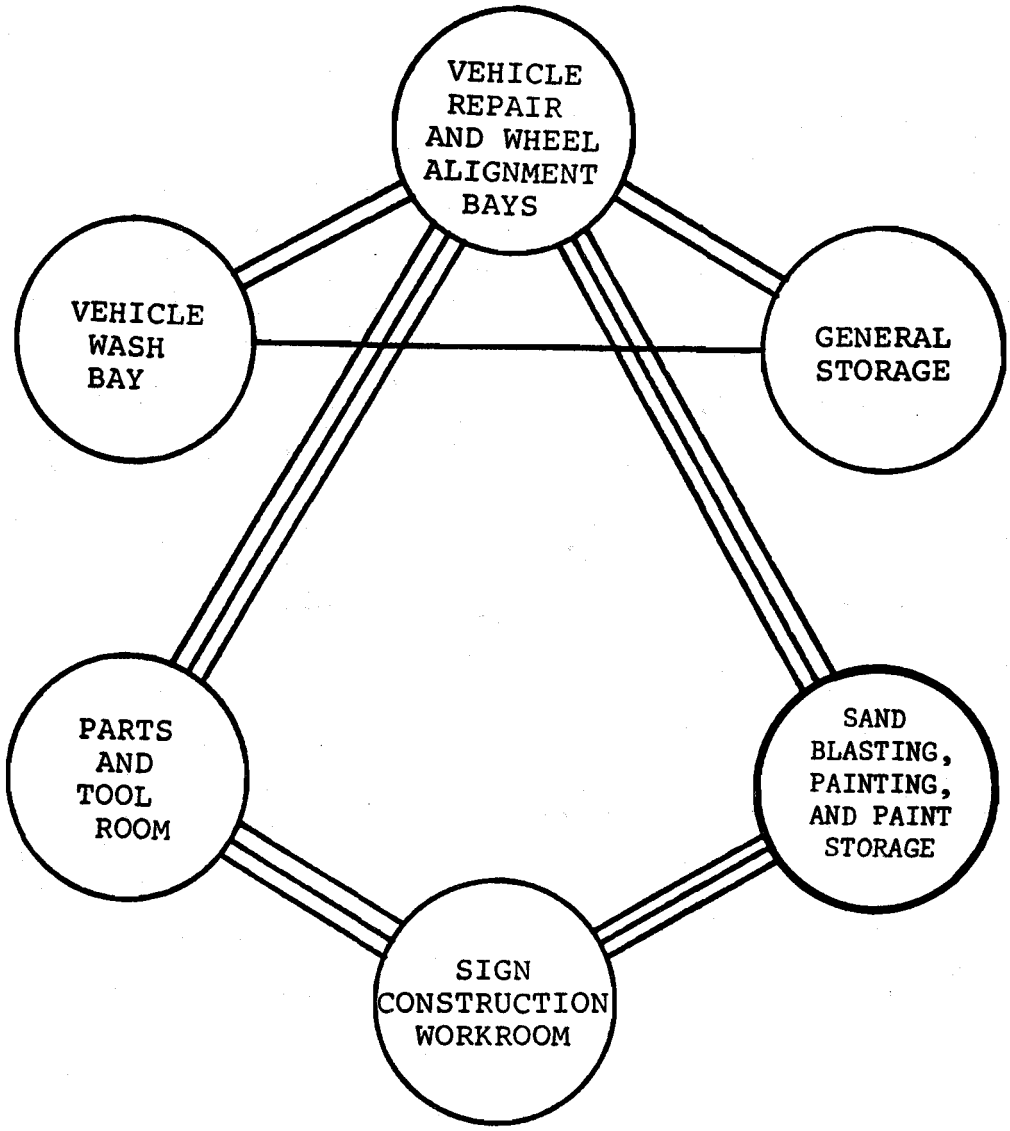
MAJOR SPATIAL RELATIONSHIPS WITHIN THE PUBLIC WORKS VEHICLE AND MATERIAL STORAGE AREA



Source: SEWRPC.

Figure 12

MAJOR SPATIAL RELATIONSHIPS WITHIN THE PUBLIC WORKS VEHICLE MAINTENANCE AREA



= STRONG RELATIONSHIP BETWEEN FUNCTIONAL SPACES

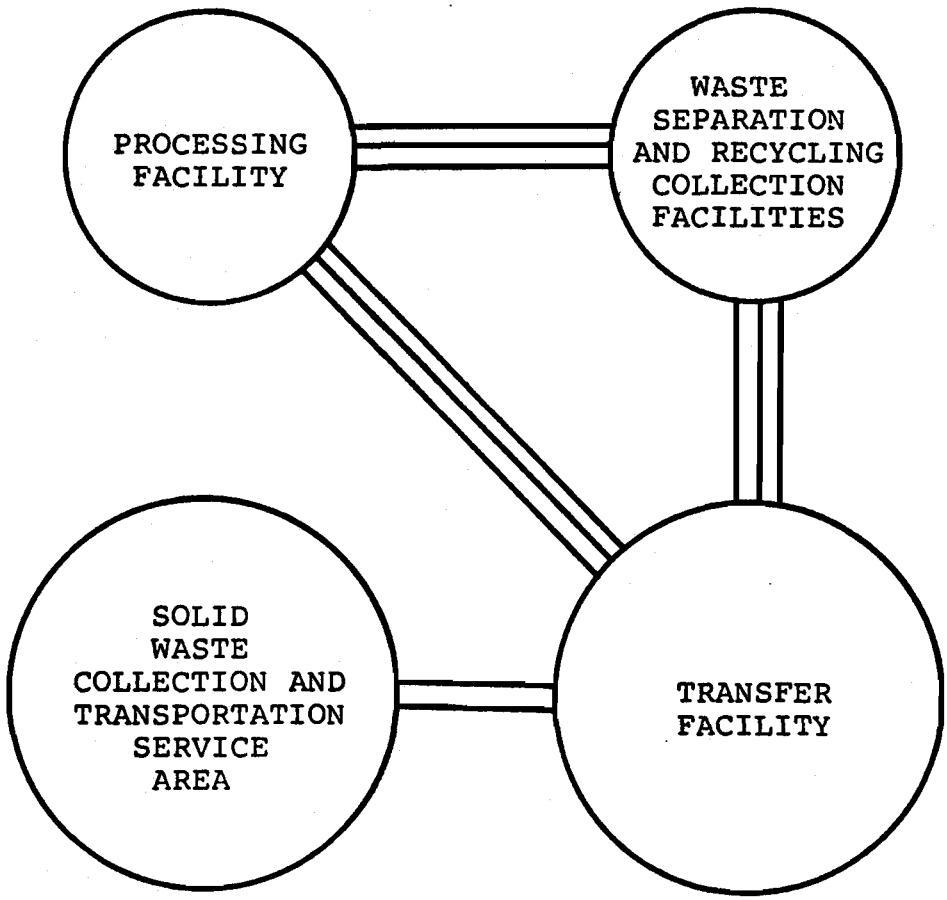
= MODERATE RELATIONSHIP BETWEEN FUNCTIONAL SPACES

= WEAK RELATIONSHIP BETWEEN FUNCTIONAL SPACES

Source: SEWRPC.

Figure 13

MAJOR SPATIAL RELATIONSHIPS WITHIN
THE SOLID WASTE FACILITY AREA



= STRONG RELATIONSHIP BETWEEN FUNCTIONAL SPACES

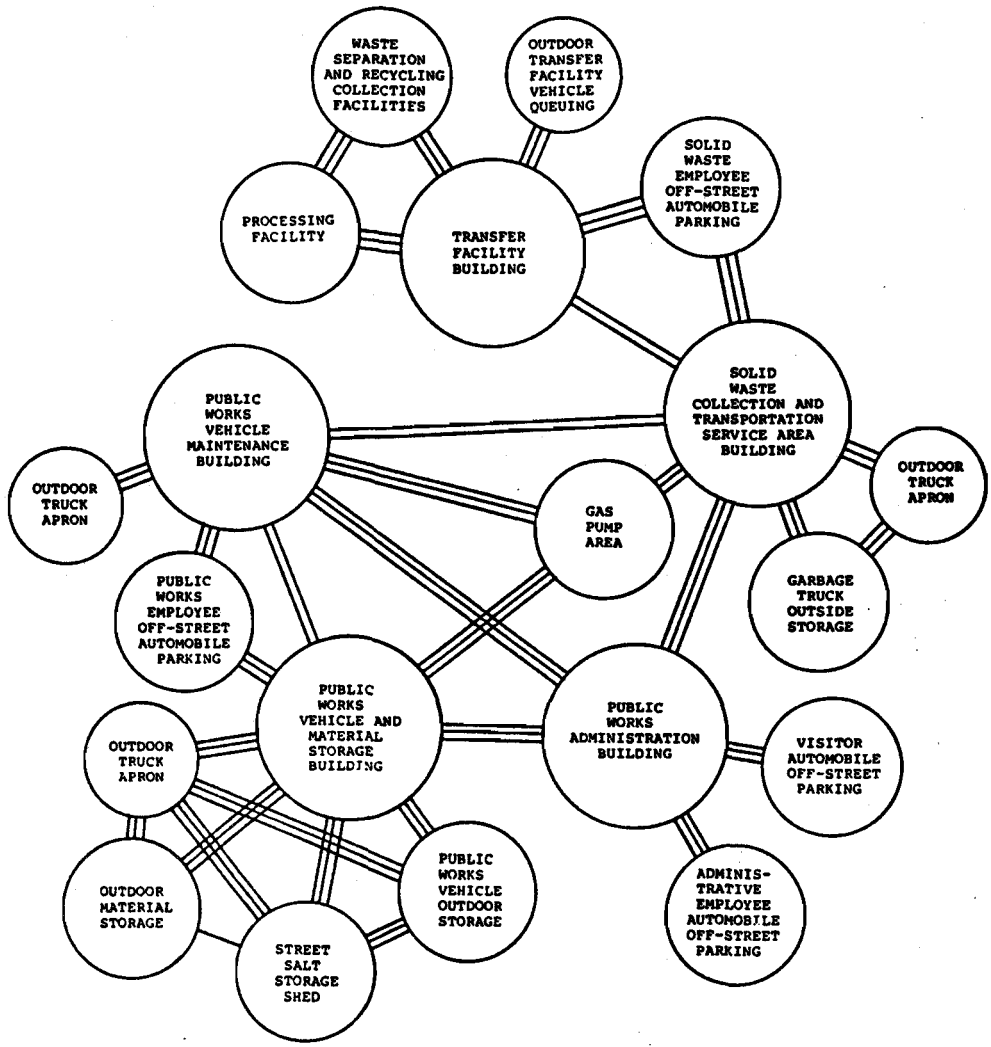
= MODERATE RELATIONSHIP BETWEEN FUNCTIONAL SPACES

= WEAK RELATIONSHIP BETWEEN FUNCTIONAL SPACES

Source: SEWRPC.

Figure 14

MAJOR SPATIAL RELATIONSHIPS OF SITE-RELATED FUNCTIONAL SPACES OF THE PUBLIC WORKS FACILITY



Source: SEWRPC.

(This page intentionally left blank)

Chapter V

ALTERNATIVE CENTRAL PUBLIC WORKS FACILITY SITE LOCATIONS AND COMPARATIVE NONECONOMIC SITE EVALUATIONS

INTRODUCTION

Certain basic data are essential to the sound evaluation of alternative sites and the selection of the most suitable site for a central public works facility. These data include definitive information on the proximity to areas serviced by street maintenance and municipal solid waste collection equipment, traffic conflicts, compatibility with neighboring land uses, man-made and natural barriers, site configuration and expansion capabilities, environmental corridor protection, conformance with the adopted city land use and urban design plan, adequate provision of utilities, soil characteristics and compatibility; site slope compatibility, and zoning.

Six alternative sites were considered for the location of a new central public works facility. Map 2 shows the location of the six sites. In addition to describing each of the sites with respect to the pertinent characteristics, a locational and site boundary sketch is presented for each site.

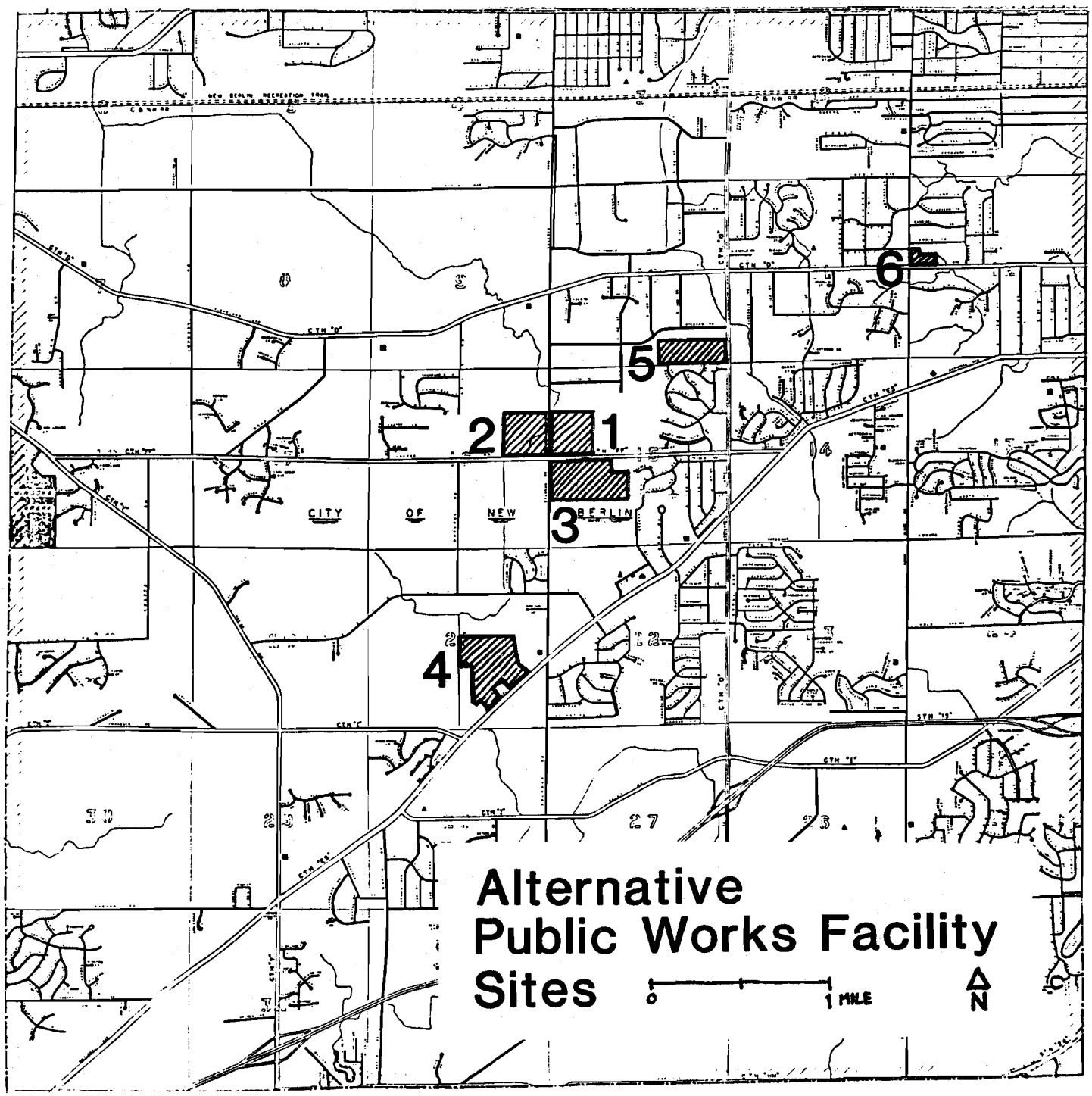
CENTRAL PUBLIC WORKS SITE PROXIMITY TO STREETS AND RESIDENTIAL AREAS SERVICED

As noted in Chapter III, the central public works facility should be located so as to minimize distance to both existing and probable future land uses to be served. In order to determine the best location for the public works facility in the City, a weighted measure of the demand public works services was developed for both the years 1980 and 2010 for each U. S. Public Land Survey Section in the City. The demand measure considered the length of existing and forecast city streets, and the existing and forecast number of occupied housing units in each section. Data on the street lengths are presented in Table 11 and on Map 3, while data relating to housing units are presented in Table 12 and on Map 4. These two tables and maps represent a refinement of the data presented in Chapter I of this study. For the purposes of this study, the total demand for services generated within each U. S. Public Land Survey Section was assumed to be located at the geographic center of the section.

To determine a location for the central public works facility that would minimize the distance to and from both the existing and probable future centers of demand, a mathematical model known as: "Facility Location on a Plane," was used.[1] The model is of the type characterized by the following general structure: given 1) a set of n points distributed in a plane (see Maps 3 and 4), and 2) a numerical value for each point representing weighted demand, the model calculates the location of the centroid of demand thus minimizing the

Map 2

GENERAL ALTERNATIVE SITE LOCATIONS FOR THE
CENTRAL PUBLIC WORKS FACILITY FOR THE CITY OF NEW BERLIN



Source: SEWRPC.

Table 11

LENGTH OF EXISTING AND FORECAST LOCAL, COLLECTOR, AND ARTERIAL STREETS MAINTAINED BY THE CITY OF NEW BERLIN BY U. S. PUBLIC LAND SURVEY SECTION: 1980 TO 2010

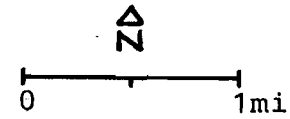
Location by U. S. Public Land Survey Section	Year		Change 1980 to 2010	
	1980 Length (Miles)	Forecast 2010 Length (Miles)	Miles	Percent Increase
T6N, R20E, Section 1	7.36	11.90	4.54	61.6
2	5.15	10.93	5.78	112.2
3	7.86	9.19	1.33	16.9
4	3.98	7.71	3.73	93.7
5	3.64	4.96	1.32	36.2
6	4.34	4.34	--	--
7	3.10	2.60	-0.50	-16.1
8	2.77	3.11	0.34	12.2
9	1.99	2.85	0.86	43.2
10	5.90	5.90	--	--
11	6.63	8.81	2.68	40.4
12	5.21	10.29	5.08	97.5
13	7.48	13.91	6.43	85.9
14	5.60	7.70	2.10	37.5
15	5.79	9.22	3.43	59.2
16	3.65	3.65	--	--
17	3.69	4.99	1.30	35.2
18	3.66	5.84	2.18	59.5
19	3.90	3.90	--	--
20	0.99	2.29	1.30	131.3
21	2.80	3.87	1.07	38.2
22	7.56	11.65	4.09	54.1
23	8.72	10.92	2.20	25.2
24	8.20	14.57	6.37	77.6
25	9.76	13.03	3.27	33.5
26	4.46	8.46	4.00	89.6
27	2.52	4.58	2.06	81.7
28	6.50	8.43	1.93	29.6
29	1.48	3.63	2.15	145.2
30	0.32	0.32	--	--
31	3.92	5.77	1.85	47.1
32	2.19	7.77	5.58	254.7
33	4.53	6.93	2.40	52.9
34	3.45	3.45	--	--
35	1.54	1.54	--	--
36	2.47	2.47	--	--
T5N, R20E, Section 5	0.08	0.08	--	--
6	0.68	0.68	--	--
Totals	163.87	242.24	78.37	47.8

Source: SEWRPC.

Map 3

LENGTH OF EXISTING AND FORECAST CITY MAINTAINED LOCAL, COLLECTOR, AND ARTERIAL STREETS IN THE CITY OF NEW BERLIN BY U. S. PUBLIC LAND SURVEY SECTION: 1980 TO 2010

6 4.34 (4.34)	**5** 3.64 (4.96)	**4** 3.98 (7.71)	**3** 7.86 (9.19)	**2** 5.15 (10.93)	**1** 7.36 (11.90)
7 3.10 (2.60)	**8** 2.77 (3.11)	**9** 1.99 (2.85)	**10** 5.90 (5.90)	**11** 6.63 (8.81)	**12** 5.21 (10.29)
18 3.66 (5.84)	**17** 3.69 (4.99)	**16** 3.65 (3.65)	**15** 5.79 (9.22)	**14** 5.60 (7.70)	**13** 7.48 (13.91)
19 3.90 (3.90)	**20** 0.99 (2.29)	**21** 2.80 (3.87)	**22** 7.56 (11.65)	**23** 8.72 (10.92)	**24** 8.20 (14.57)
30 0.32 (0.32)	**29** 1.48 (3.63)	**28** 6.50 (8.43)	**27** 2.52 (4.58)	**26** 4.46 (8.46)	**25** 9.76 (13.03)
31 3.92 (5.77)	**32** 2.19 (7.77)	**33** 4.53 (6.93)	**34** 3.45 (3.45)	**35** 1.54 (1.54)	**36** 2.47 (2.47)
6' 0.68 (0.68)	**5'** 0.08 (0.08)				



3 = SECTION NUMBER

3.90 = EXISTING STREETS (miles)

(3.90) = FORECAST STREETS (miles)

Source: SEWRPC.

Table 12

EXISTING AND FORECAST OCCUPIED HOUSING UNITS BY U. S. PUBLIC LAND SURVEY SECTION FOR THE CITY OF NEW BERLIN: 1980 TO 2010

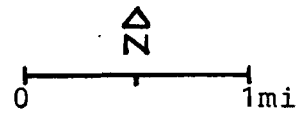
Location by U. S. Public Land Survey Section	Year		Change 1980 to 2010	
	1980 Total Occupied Housing Units	Forecast 2010 Total Occupied Housing Units	Number of Units	Percent Increase
T6N, R20E, Section 1	925	930	5	0.5
2	487	1,000	513	105.3
3	884	900	16	1.8
4	283	345	62	21.9
5	110	310	200	181.8
6	157	200	43	27.3
7	64	80	16	25.0
8	62	90	28	45.1
9	204	210	6	2.9
10	10	--	-10	-100.0
11	592	750	158	26.6
12	428	790	362	84.5
13	742	1,570	828	111.5
14	323	910	587	181.7
15	337	725	388	115.1
16	110	130	20	18.1
17	129	160	31	24.0
18	108	130	22	20.3
19	68	90	22	32.3
20	48	110	62	129.1
21	95	140	45	47.3
22	404	850	446	110.3
23	766	945	179	23.3
24	136	1,280	1,144	841.1
25	544	880	336	61.7
26	101	110	9	8.9
27	32	20	-12	-37.5
28	352	410	58	16.4
29	127	170	43	33.8
30	12	20	8	66.6
31	242	270	28	11.5
32	178	300	122	68.5
33	124	180	56	45.1
34	53	50	- 3	- 5.6
35	38	40	2	5.2
36	68	75	7	10.2
T5N, R20E, Section 5	1	--	- 1	-100.0
6	6	--	- 6	-100.0
Totals	9,350	15,170	5,820	62.2

Source: SEWRPC.

Map 4

EXISTING AND FORECAST OCCUPIED HOUSING UNITS FOR THE CITY OF NEW BERLIN BY U. S. PUBLIC LAND SURVEY SECTION: 1980 TO 2010

6 157 (200)	**5** 110 (310)	**4** 283 (345)	**3** 884 (900)	**2** 487 (1000)	**1** 925 (930)
7 64 (80)	**8** 62 (90)	**9** 204 (210)	**10** 10 (0)	**11** 592 (750)	**12** 428 (790)
18 108 (130)	**17** 129 (160)	**16** 110 (130)	**15** 337 (725)	**14** 323 (910)	**13** 742 (1570)
19 68 (90)	**20** 48 (110)	**21** 95 (140)	**22** 404 (850)	**23** 766 (945)	**24** 136 (1280)
30 12 (20)	**29** 127 (170)	**28** 352 (410)	**27** 32 (20)	**26** 101 (110)	**25** 544 (880)
31 242 (270)	**32** 178 (300)	**33** 124 (180)	**34** 53 (50)	**35** 38 (40)	**36** 68 (75)
6' 6 (0)	**5'** 1 (0)				



3 = SECTION NUMBER

178 = EXISTING HOUSING UNITS (1980)

(300) = FORECAST HOUSING UNITS (2010)

Source: SEWRPC.

distances between the points of demand and of the facility on the plane. This is expressed mathematically as follows:

Minimize:

$$Z = \sum_{i=1}^{n} \sum_{j=1}^{n} a_{ij} w_i d_{ij}$$

Iterative Calculation of Facility Location:

$$P_j = \sum_{i=1}^{n} \frac{w_i x_i}{d_{ij}} \Big/ \sum_{i=1}^{n} \frac{w_i}{d_{ij}}$$

$$q_j = \sum_{i=1}^{n} \frac{w_i y_i}{d_{ij}} \sum_{i=1}^{n} \frac{w_i}{d_{ij}}$$

Where:

Z = Total distance traveled, expressed in miles
i = demand point
j = facility
n = number of demand points
m = number of facilities
a_{ij} = nearest facility to demand point i
w_i = weight for demand point i
d_{ij} = distance from facility to demand point i
x_i = x coordinate for demand point i
y_i = y coordinate for demand point i
p_j = x coordinate for facility j
q_j = y coordinate for facility j

The application is iterative and the values converge on the values of p_j and q_j that minimize the total distance. The iterative procedure is repeated until the change in coordinate locations of the facility is less than a selected value.

---

[1]Ottensmann, John R., BASIC Microcomputer Programs for Urban Analysis and Planning, New York: Chapman and Hall, 1985.

The "Facility Location on a Plane Model" program was run on a microcomputer utilizing four sets of data which established the relative weights of the demand points as follows:

1. Thirty-eight demand points relative to the length of streets maintained by the Street Department in 1980 (see Map 3).
2. Thirty-eight demand points relative to the forecast length of streets to be maintained by the Street Department in 2010 (see Map 3) pursuant to the adopted city land use plan.
3. Thirty-eight demand points relative to the existing number of occupied housing units in 1980 (see Map 4).
4. Thirty-eight demand points relative to the forecast number of housing units in the year 2010 (see Map 4) pursuant to the adopted city land use plan.

Map 5 graphically summarizes the findings of the modeling effort indicating that the optimal distance-minimizing location for a central street maintenance facility would be in U. S. Land Survey Section 15, and the optimal distance-minimizing location for a solid waste operational facility would be in U. S. Public Land Survey Section 14. Six alternative sites were then considered for the potential location of a central public works facility.

ALTERNATIVE SITE 1

Site Size, Location, and Proximity to Streets and Residential Areas Served

Alternative Site 1 is shown on Figure 15. The site is approximately 37.9 acres in area and is located on the northeast corner of the intersection of Coffee Road and Calhoun Road in U. S. Public Land Survey Section 15. The site is rated as excellent with respect to proximity to the streets and land uses to be served.

Traffic Conflicts

Vehicular access to the site is provided by both Coffee Road and Calhoun Road. These two streets function as local arterials. In 1985, the average weekday traffic volume on Coffee Road east of Calhoun Road was 5,420 vehicles and on Calhoun Road north of Coffee Road was 6,790 vehicles. Excellent access to the site can be provided from both Coffee Road and Calhoun Road, thus minimizing potential traffic conflicts for both site ingress and egress.

Compatibility With Neighboring Land Uses

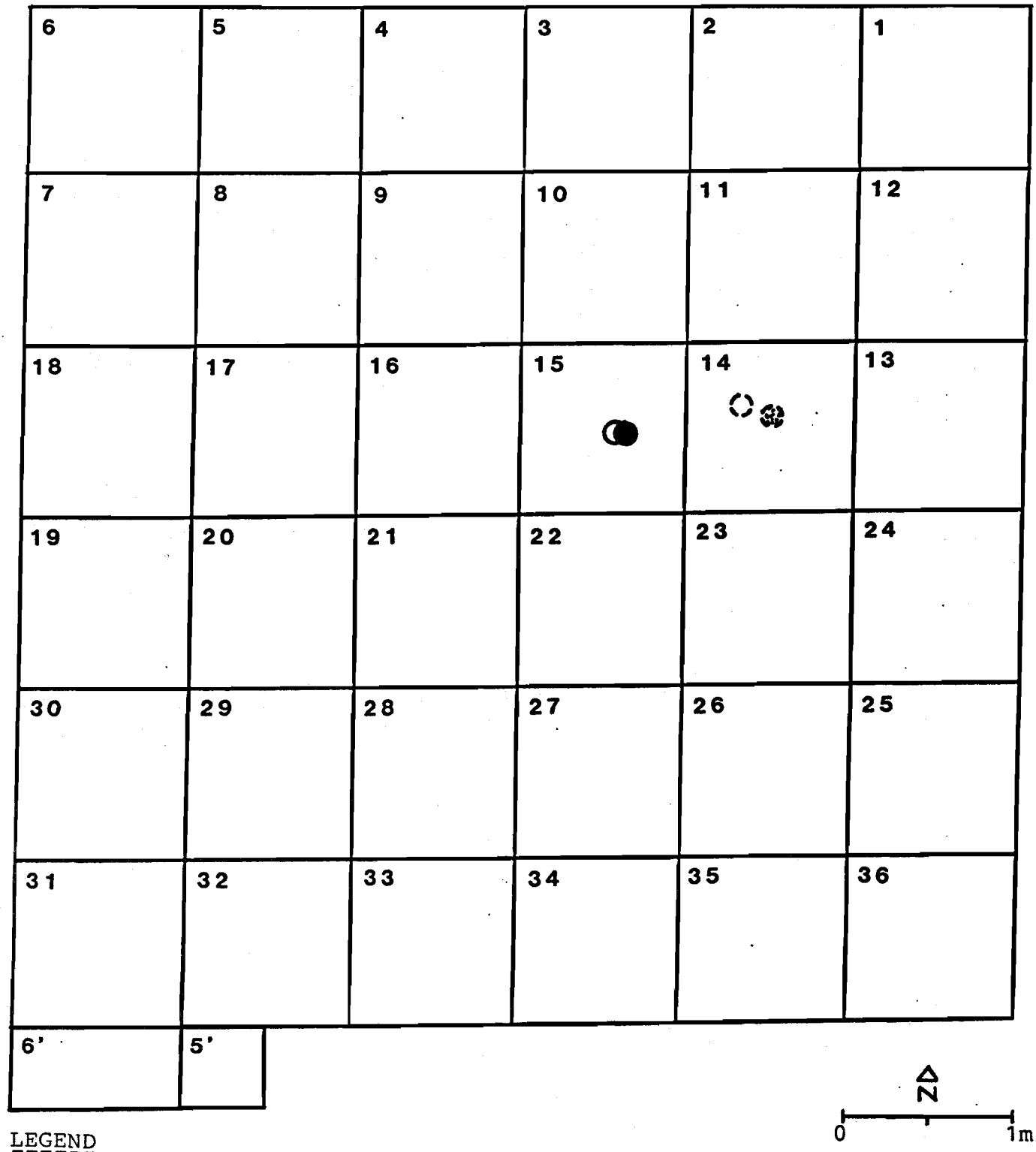
The site is contiguous to the following land uses: north--vacant lands; south--vacant lands; east--one single-family residence and vacant lands; and west--vacant lands. Compatibility with neighboring land uses is therefore good.

Man-Made and Natural Barriers

No significant man-made or natural barriers are located near the site to impede access to other areas of the City. Therefore, the site is rated as excellent for this characteristic.

Map 5

OPTIMAL DISTANCE-MINIMIZING SITE LOCATIONS FOR THE CITY OF NEW BERLIN CENTRAL PUBLIC WORKS FACILITY



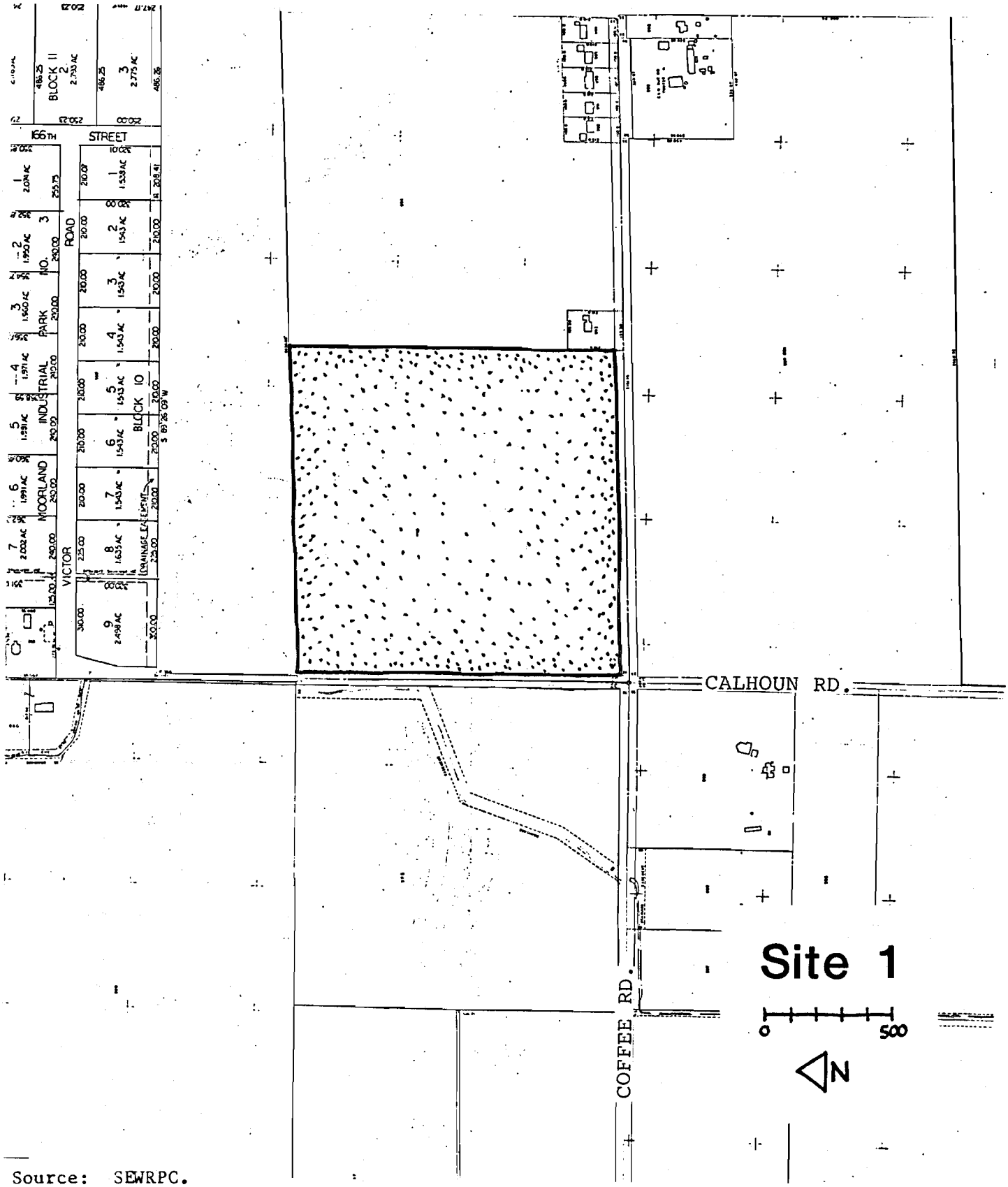
LEGEND

- ○ OPTIMUM SITE LOCATION FOR YEAR 1980 STREET MAINTENANCE FACILITY
- ● OPTIMUM SITE LOCATION FOR YEAR 2010 STREET MAINTENANCE FACILITY
- ◌ OPTIMUM SITE LOCATION FOR YEAR 1980 SOLID WASTE FACILITY
- ◉ OPTIMUM SITE LOCATION FOR YEAR 2010 SOLID WASTE FACILITY
- 12 SECTION NUMBER

Source: SEWRPC.

Figure 15

ALTERNATIVE SITE 1



Source: SEWRPC.

Site Configuration and Expansion Capabilities
The site is approximately square in shape and, since the site is over 37 acres in area, offers excellent onsite facility expansion capabilities.

Environmental Corridor Protection
About 9.7 acres, or about 26 percent of the total site area, are comprised of secondary environmental corridors as indicated in Table 13 and graphically illustrated on Figure 16. There are no primary environmental corridors or isolated natural areas on the site. The site is thus rated as good with respect to this characteristic.

Conformance With the Adopted City Land Use and Urban Design Plan
The adopted City land use and urban design plan indicates that Site 1 be developed for light industrial use and that the secondary environmental corridor lands at the site be preserved and carefully integrated into the planned urban uses. A central public works facility located at this site would be in conformance with the adopted plan.

Adequate Provision of Utilities (Sanitary Sewer and Water)
Based upon City of New Berlin Engineering Department analysis, approximately 3,700 feet of sanitary sewer and water main would have to be constructed to service the site. The site is thus rated as poor with respect to this characteristic. However, these facilities are planned to be constructed within the next 10 years and will serve other properties which will share the cost of their construction.

Soil Characteristics and Compatibility
Table 14 lists and quantifies the soil types present on the site with respect to limitations for light industrial development. Soil types found at Site 1 include Tichigan silt loam, Ehler silt loam, and Bono silty clay loam (thin surface variant). Table 15 presents data pertaining to the areas of the site covered by each of the soil types which have severe or very severe limitations for light industrial use, and Figure 17 graphically illustrates the location of those soils. Site 1 is completely covered by soils which pose severe limitations for this type of development, and thus the site is accordingly rated as poor with respect to this characteristic.

Site Slope Compatibility With Use
Table 16 indicates that the slopes found at Site 1 are between 0 and 3 percent. The site is accordingly rated as excellent with respect to this characteristic.

Zoning
Alternative Site 1 is current in the M-1 Limited Industrial Zoning District. Public utility facilities, such as the central public works facility, are permitted as conditional uses within the district. Due to the similarity of the central public works facility to the industrial uses permitted in the M-1 District, the site is rated as excellent with respect to zoning.

Table 13

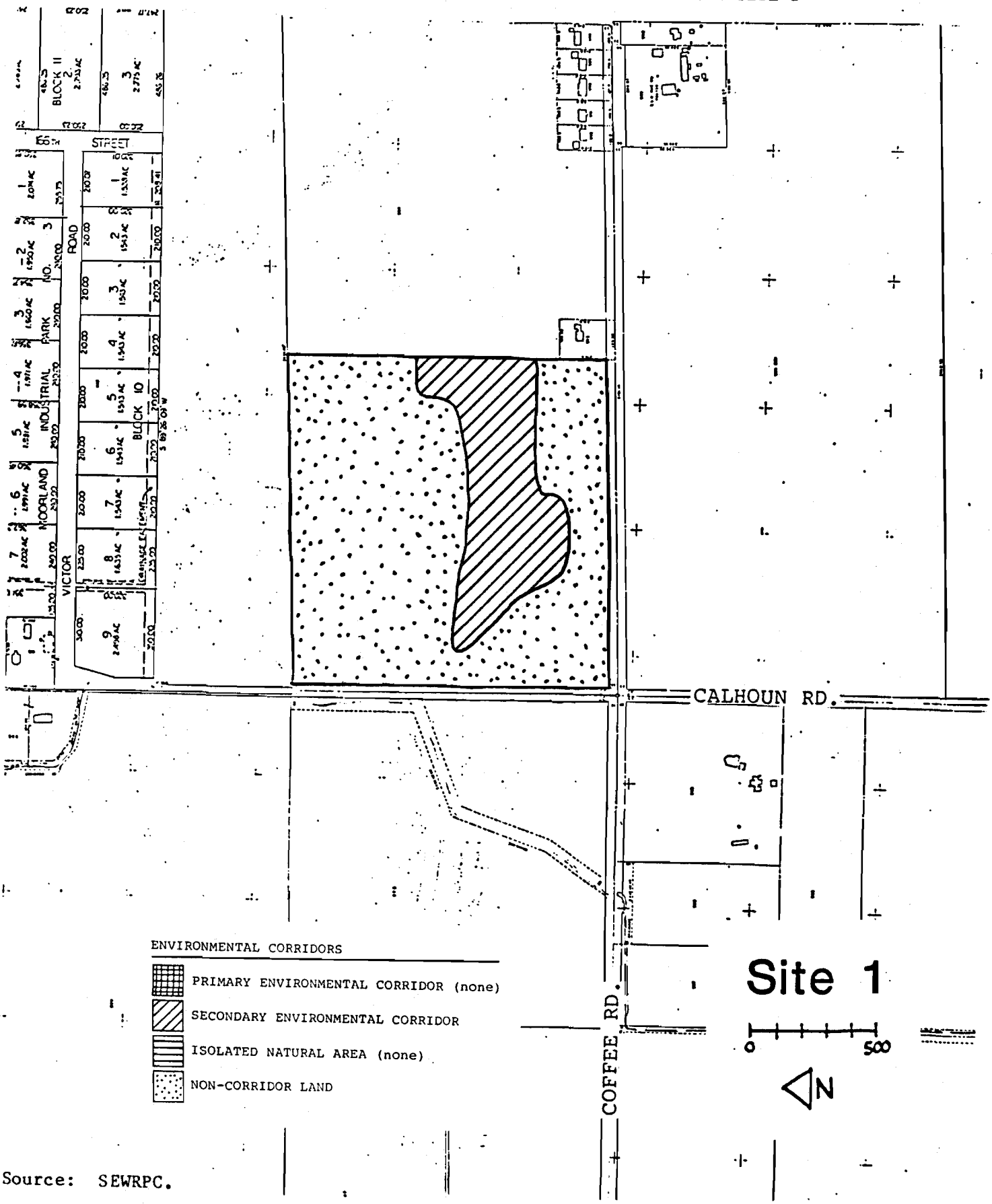
ENVIRONMENTAL CORRIDORS AND ISOLATED NATURAL AREAS AT ALTERNATIVE SITES 1, 2, 3, 4, AND 5

	Alternative Site 1		Alternative Site 2		Alternative Site 3		Alternative Site 4		Alternative Site 5	
	Area Covered in Acres	Percent of Total	Area Covered In Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total
Primary Environmental Corridor	--	--	--	--	--	--	--	--	--	--
Secondary Environmental Corridor	9.7	25.6	16.4	43.6	9.8	13.7	12.6	19.4	25.4	86.4
Isolated Natural Areas	--	--	--	--	--	--	--	--	--	--
Noncorridor Lands	28.2	74.4	21.2	56.4	61.6	86.3	52.2	80.6	4.0	13.6
Total Area	37.9	100.0	37.6	100.0	71.4	100.0	64.8	100.0	29.4	100.0

Source:

Figure 16

LOCATION OF ENVIRONMENTAL CORRIDORS AT ALTERNATIVE SITE 1



Source: SEWRPC.

PJM/ea
9/11/86
IE010E/E

Table 14 (page 1 of 2)

DETAILED LIMITATIONS OF SOILS FOR LIGHT INDUSTRIAL AND COMMERCIAL DEVELOPMENT
FOR THOSE SOIL SERIES FOUND AT ALTERNATIVE SITES 1, 2, 3, 4, AND 5

SEWRPC Soil Symbol	Soil Name	Limitation for Light Industrial and Commercial Buildings	Alternative Site 1		Alternative Site 2		Alternative Site 3		Alternative Site 4		Alternative Site 5	
			Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered of Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total
29	Colwood silt loam	SEVERE--high water table; frost heave.	--	--	--	--	--	--	11.1	17.2	--	--
38	Kibbie silt loam	MODERATE--low bearing capacity; piping; high water table; frost heave.	--	--	--	--	--	--	3.0	4.6	--	--
40	Saylesville loam	MODERATE on 0-6 percent and SEVERE on steeper slopes; high shrink-swell potential; frost heave; erosion on slopes.	--	--	--	--	--	--	--	--	3.0	10.2
42	Tichigan silt loam	SEVERE--high water table; high shrink-swell potential; low bearing capacity; erosion on slopes.	15.2	40.1	14.1	37.5	5.7	8.0	1.0	1.5	6.2	21.1
63	Brookston silt loam	SEVERE--high water table; occasional overflow; frost heave.	--	--	--	--	--	--	6.1	9.4	--	--
212	Ehler silt loam	SEVERE--high water table; high shrink-swell potential; piping.	3.8	10.0	--	--	--	--	13.2	20.5	--	--
217	Bono silty clay loam	SEVERE--high water table; high shrink-swell potential; low bearing capacity; low shear strength.	--	--	--	--	--	--	--	--	3.0	10.2
218	Bono silty clay loam-thin surface variant	SEVERE--high water table; high shrink-swell potential; low bearing capacity; low shear strength.	18.9	49.9	23.5	62.5	51.3	71.9	--	--	8.2	27.9
233V	Kibbie fine sandy loam	MODERATE--low bearing capacity; piping; high water table; frost heave.	--	--	--	--	--	--	1.0	1.5	--	--

(continued)

Table 14 (page 2 of 2)

SEWRPC Soil Symbol	Soil Name	Limitation for Light Industrial and Commercial Buildings	Alternative Site 1		Alternative Site 2		Alternative Site 3		Alternative Site 4		Alternative Site 5	
			Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered of Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total
360	Hochheim silt loam	SLIGHT on 0-6 percent; MODERATE on 6-12 percent; and SEVERE on steeper slopes; erosion on slopes.	--	--	--	--	4.8	6.7	5.1	7.9	--	--
362	Theresa silt loam	SLIGHT on 0-6 percent; MODERATE on 6-12 percent; and SEVERE on steeper slopes; erosive on slopes; frost heave.	--	--	--	--	4.8	6.7	14.2	21.9	--	--
364	Lamartine silt loam	MODERATE--high water table; erosive on slopes; frost heave.	--	--	--	--	4.8	6.7	9.1	14.0	--	--
397	Ozaukee silt loam	MODERATE on 0-6 percent and SEVERE on steeper slopes; low bearing capacity; high shrink-swell potential; erosive on slopes.	--	--	--	--	--	--	--	--	3.9	13.3
399	Mequon silt loam	SEVERE--high water table; high shrink-swell potential; low bearing capacity; erosive on slopes; frost heave.	--	--	--	--	--	--	1.0	1.5	4.1	13.9
456	Ogden muck	VERY SEVERE--high water table; erosive; clays have high shrink-swell potential.	--	--	--	--	--	--	--	--	1.0	3.4
Total			37.9	100.0	37.6	100.0	71.4	100.0	64.8	100.0	29.4	100.0

Source: SEWRPC.

5/8/87
IE010E/F

Table 15

SUMMARY OF SOIL LIMITATIONS FOR LIGHT INDUSTRIAL AND COMMERCIAL BUILDINGS
AT ALTERNATIVE SITES 1, 2, 3, 4, AND 5

Limitation	Alternative Site 1		Alternative Site 2		Alternative Site 3		Alternative Site 4		Alternative Site 5	
	Area Covered in Acres	Percent of Total	Area Covered In Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total
Severe	37.9	100.0	37.6	100.0	57.0	79.8	36.4	56.2	21.5	73.1
Very Severe	--	--	--	--	--	--	--	--	1.0	3.4
Subtotal	37.9	100.0	37.6	100.0	57.0	79.8	36.4	56.2	22.5	76.5
All Other Soils .	--	--	--	--	14.4	20.2	28.4	43.8	6.9	23.5
Total Area	37.9	100.0	37.6	100.0	71.4	100.0	64.8	100.0	29.4	100.0

Source: SEWRPC.

ALTERNATIVE SITE 2

Site Size, Location, and Proximity to Streets and Residential Areas Served

Alternative Site 2 is shown on Figure 18. The site is approximately 37.6 acres in area and is located on the northwest corner of the intersection of Coffee Road and Calhoun Road in U. S. Public Land Survey Section 16. Therefore, the site is rated as good with respect to proximity to the streets and land uses to be served.

Traffic Conflicts

Vehicular access to the site is provided by both Coffee Road and Calhoun Road. These two streets function as local arterials. In 1985, the average weekday traffic volume on Coffee Road west of Calhoun Road was 3,670 vehicles and on Calhoun Road north of Coffee Road was 6,790 vehicles. Excellent access to the site can be provided from both Coffee Road and Calhoun Road, thus minimizing potential traffic conflicts for both site ingress or egress. However, a large stormwater drainage channel is proposed in this area along Calhoun Road which will require the construction of a box culvert where the facility driveways cross this channel.

Compatibility With Neighboring Land Uses

The site is contiguous to the following land uses: north--vacant lands; south --two single-family residences and vacant lands; east--vacant lands; and west--vacant lands. Compatibility with neighboring land uses is, therefore, good.

Man-Made and Natural Barriers

No significant man-made or natural barriers are located near the site to impede access to other areas of the City. However, a significant drainage ditch is located at the site, as shown on Figure 18, which poses site development limitations. This drainage ditch is planned to be enlarged. Therefore, the site is rated as fair for this characteristic.

Site Configuration and Expansion Capabilities

The site is approximately square in shape and, since the site is over 37 acres in area, offers excellent facility expansion capabilities.

Environmental Corridor Protection

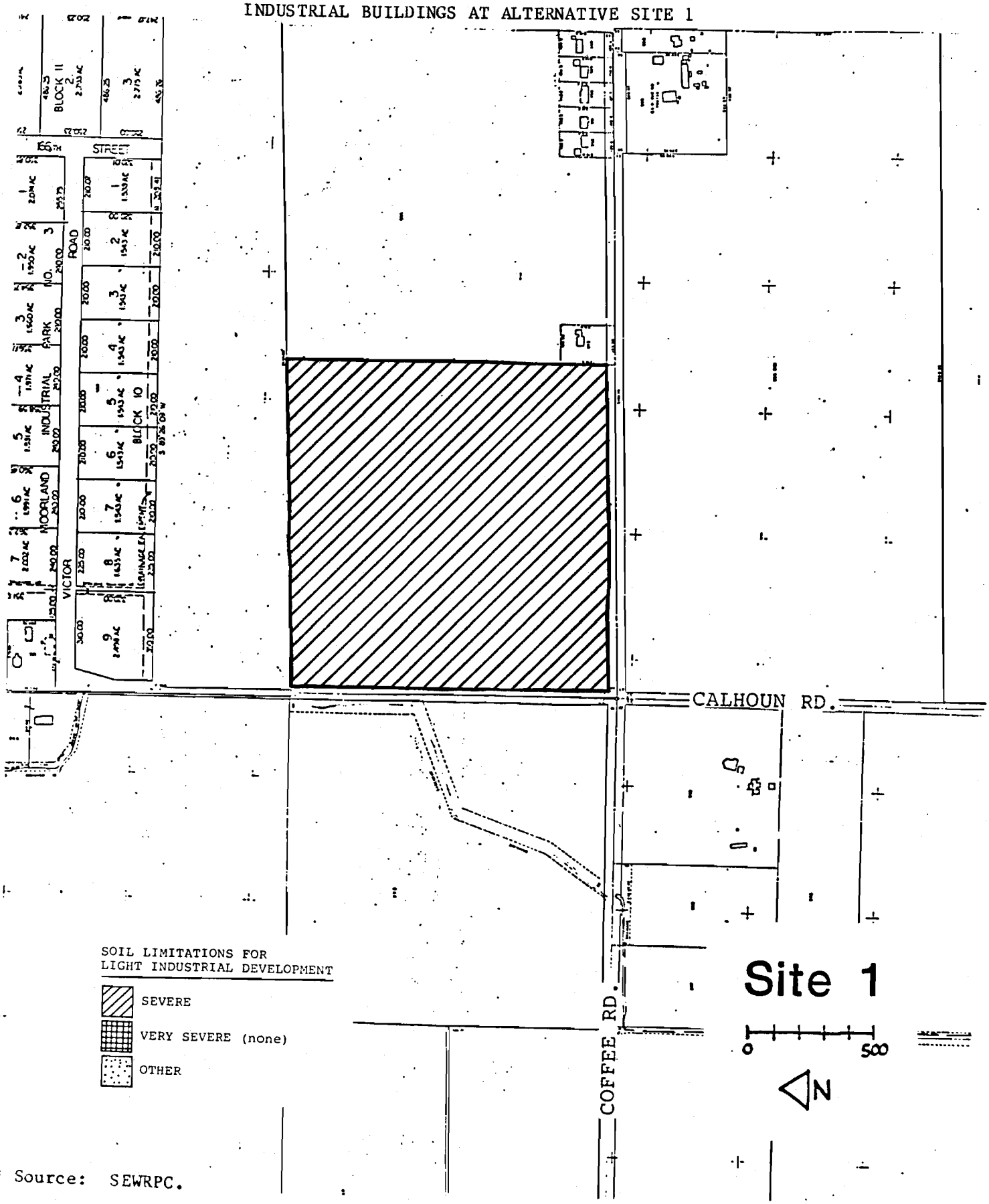
About 16.4 acres, or about 44 percent of the total site area, are comprised of secondary environmental corridors as indicated earlier in Table 13 and graphically illustrated on Figure 19. There are no primary environmentl corridors or isolated natural areas identified at the site. The site is thus rated as fair with respect to this characteristic.

Conformance With the Adopted City Land Use and Urban Design Plan

The adopted City land use and urban design plan indicates that Site 2 be used for rural estate residential, agricultural, secondary environmental corridor, and recreation corridor/trail land uses. Therefore, the construction of a central public works facility at this site would be in conflict with the adopted plan.

Figure 17

LOCATION OF SOILS WITH LIMITATIONS FOR INDUSTRIAL BUILDINGS AT ALTERNATIVE SITE 1



Source: SEWRPC.

Table 16

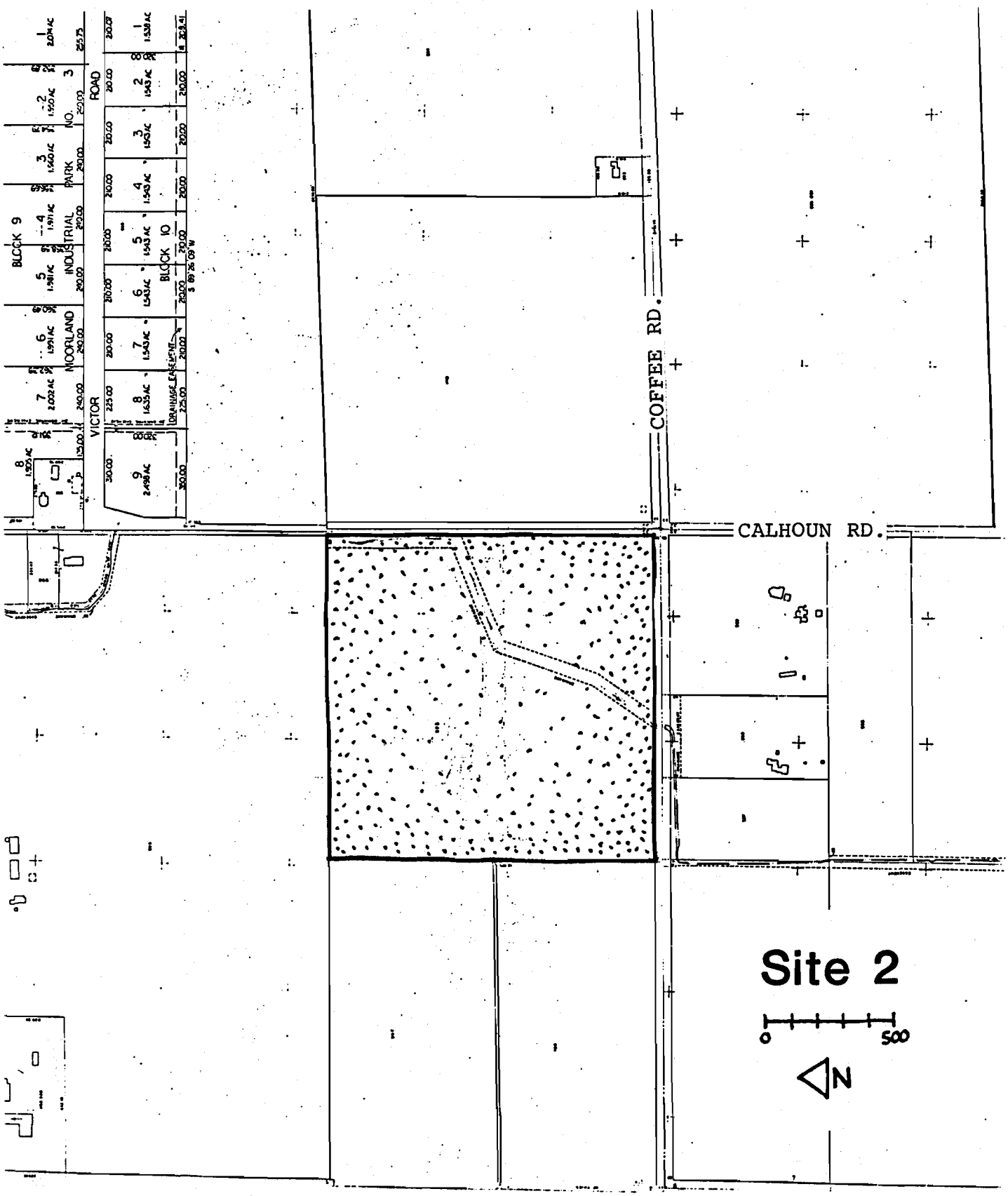
CHARACTERISTICS OF SLOPES
AT ALTERNATIVE SITES 1, 2, 3, 4, AND 5

Percentage of Slope	Alternative Site 1		Alternative Site 2		Alternative Site 3		Alternative Site 4		Alternative Site 5	
	Area Covered in Acres	Percent of Total	Area Covered In Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total	Area Covered in Acres	Percent of Total
0-3 Percent Slope	37.9	100.0	37.6	100.0	62.4	87.4	46.2	71.2	22.4	76.2
4-6 Percent Slope	--	--	--	--	--	--	10.8	16.7	7.0	23.8
7-11 Percent Slope	--	--	--	--	9.0	12.6	2.9	4.5	--	--
12 Percent or Greater Slope .	--	--	--	--	--	--	4.9	7.6	--	--
Total	37.9	100.0	37.6	100.0	71.4	100.0	64.8	100.0	29.4	100.0

Source: SEWRPC.

Figure 18

ALTERNATIVE SITE 2



Source: SEWRPC.

Adequate Provision of Utilities (Sanitary Sewer and Water)
Based upon City of New Berlin Engineering Department analysis, approximately 4,500 feet of sanitary sewer and about 2,200 feet of water main would have to be constructed to service the site. The site is thus rated as poor with respect to this characteristic.

Soil Characteristics and Compatibility
Table 14 lists and quantifies the soil types present on the site with respect to limitations for light industrial development. Soil types found at Site 2 include Tichigan silt loam and Bono silty clay loam. Table 15 presents data pertaining to areas of the site covered by soil types which have severe or very severe limitations for light industrial use, and Figure 20 graphically illustrates the location of those soils. Site 2 is completely covered by soils which pose severe limitations for this type of development, and is, therefore, rated as poor with respect to this characteristic.

Site Slope Compatibility With Use
Table 16 indicates that the slopes found at Site 2 are between 0 and 3 percent. The site is accordingly rated as excellent with respect to this characteristic.

Zoning
Alternative Site 2 is currently zoned in the R-2 Residential and C-1 Conservancy Zoning Districts. Public utility facilities, such as the central public works facility, are permitted as conditional uses within these districts. Due to the dissimilarity of the central public works facility to the uses permitted in these two districts, the site is rated as fair with respect to zoning.

ALTERNATIVE SITE 3

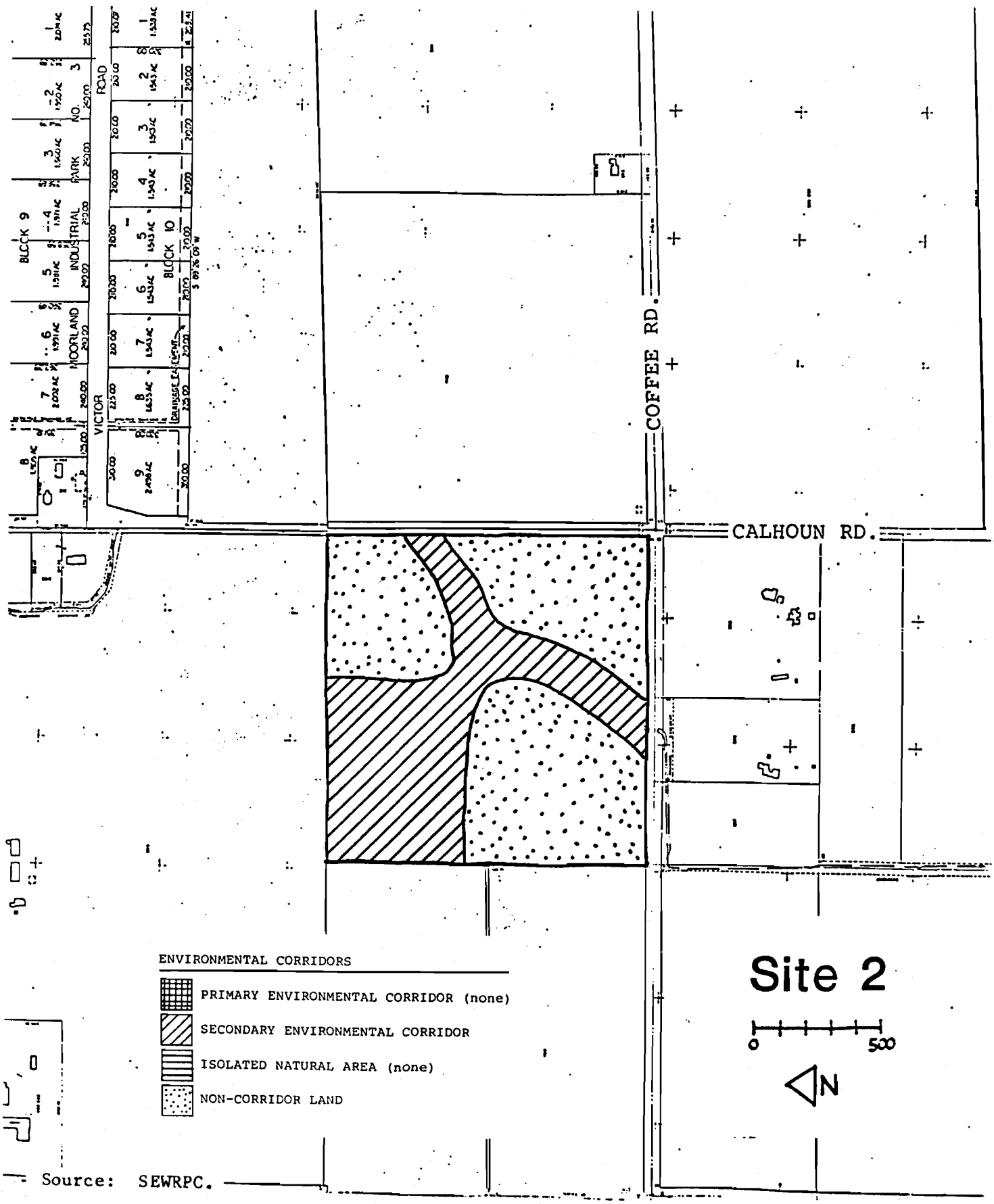
Site Size, Location, and Proximity to Streets, and Residential Areas Served
Alternative Site 3 is shown on Figure 21. The site is approximately 71.4 acres in area and is located on the southeast corner of the intersection of Coffee Road and Calhoun Road in U. S. Public Land Survey Section 15. The site is rated as excellent with respect to proximity to the streets and land uses to be served.

Traffic Conflicts
Vehicular access to the site is provided by both Coffee Road and Calhoun Road. These two streets function as local arterials. In 1985, the average weekday traffic volume on Coffee Road east of Calhoun Road was 5,420 vehicles and on Calhoun Road south of Coffee Road was 5,150 vehicles. Excellent access to the site can be provided from from both Coffee Road and Calhoun Road, thus minimizing potential traffic conflicts for both site ingress and egress.

Compatibility With Neighboring Land Uses
The site is continuguous to the following land uses: north--three single-family residences and vacant lands; south--city park; east--single-family residential subdivision; and west--one single-family residence and vacant lands. Compatibility with neighboring land uses is, therefore, fair.

Figure 19

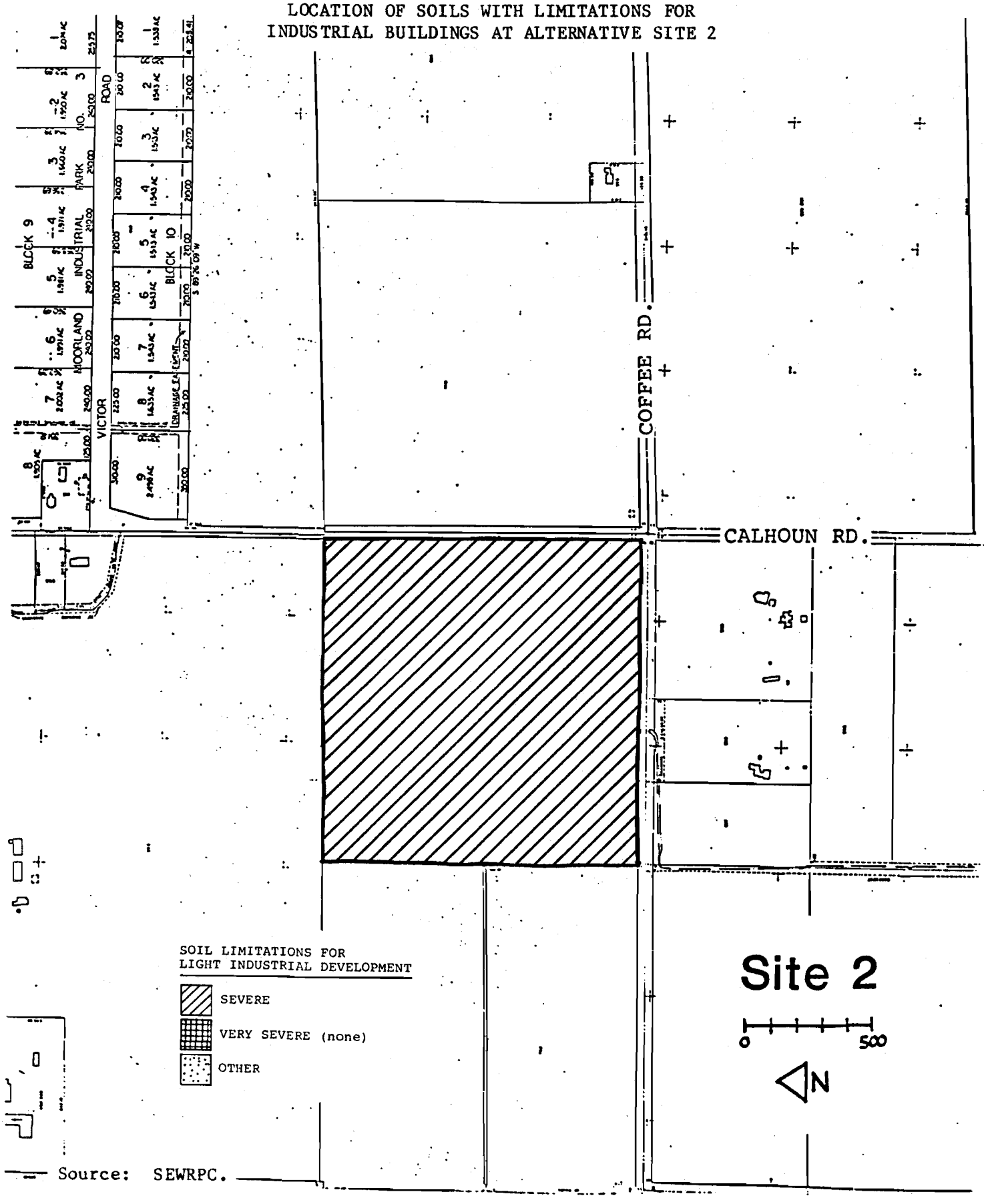
LOCATION OF ENVIRONMENTAL CORRIDORS AT ALTERNATIVE SITE 2



Source: SEWRPC.

Figure 20

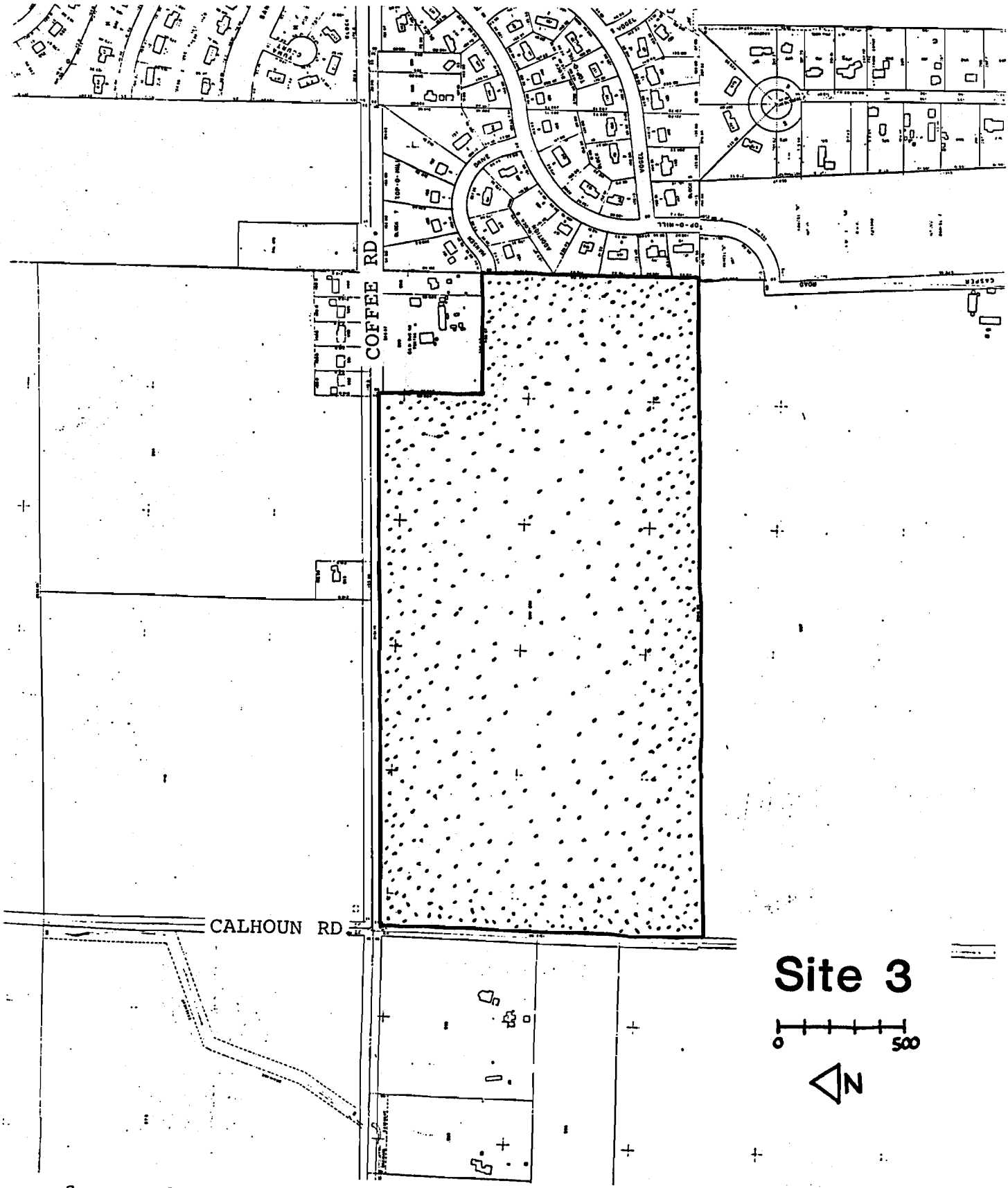
LOCATION OF SOILS WITH LIMITATIONS FOR INDUSTRIAL BUILDINGS AT ALTERNATIVE SITE 2



Source: SEWRPC.

Figure 21

ALTERNATIVE SITE 3



Source: SEWRPC.

Man-Made and Natural Barriers

No significant man-made or natural barriers are located near the site to impede access to other areas of the City. Therefore, the site is rated as excellent for this characteristic.

Site Configuration and Expansion Capabilities

The site is rectangular in shape and, since the site is over 71 acres in area, offers excellent facility expansion capabilities.

Environmental Corridor Protection

About 9.8 acres, or only about 14 percent of the total site area are comprised of secondary environmental corridors as indicated earlier in Table 13 and graphically illustrated on Figure 22. There are no primary environmental corridors or isolated natural areas on the site. The site is thus rated as good with respect to this characteristic.

Conformance With the Adopted City Land Use and Urban Design Plan

The adopted City land use and urban design plan indicates that Site 3 be retained for a number of uses including: the preservation of secondary environmental corridor areas located at the site, a recreation corridor/trail, a neighborhood shopping center, high-density urban residential development (7.0 to 12.0 dwelling units per net residential acre), high medium-density urban residential development (4.4 to 6.9 dwelling units per net residential acre), and medium-density urban residential development (10,000- to 20,000-square-foot size lots). The construction of a central public works facility at this site would be in conflict with the adopted plan.

Adequate Provision of Utilities (Sanitary Sewer and Water)

Based upon City of New Berlin Engineering Department analysis, approximately 3,700 linear feet of sanitary sewer and water main would have to be extended in order to service the site. The site is thus rated as poor with respect to this characteristic. However, these facilities are planned to be constructed within the next few years and will serve other properties which will share the cost of construction.

Soil Characteristics and Compatibility

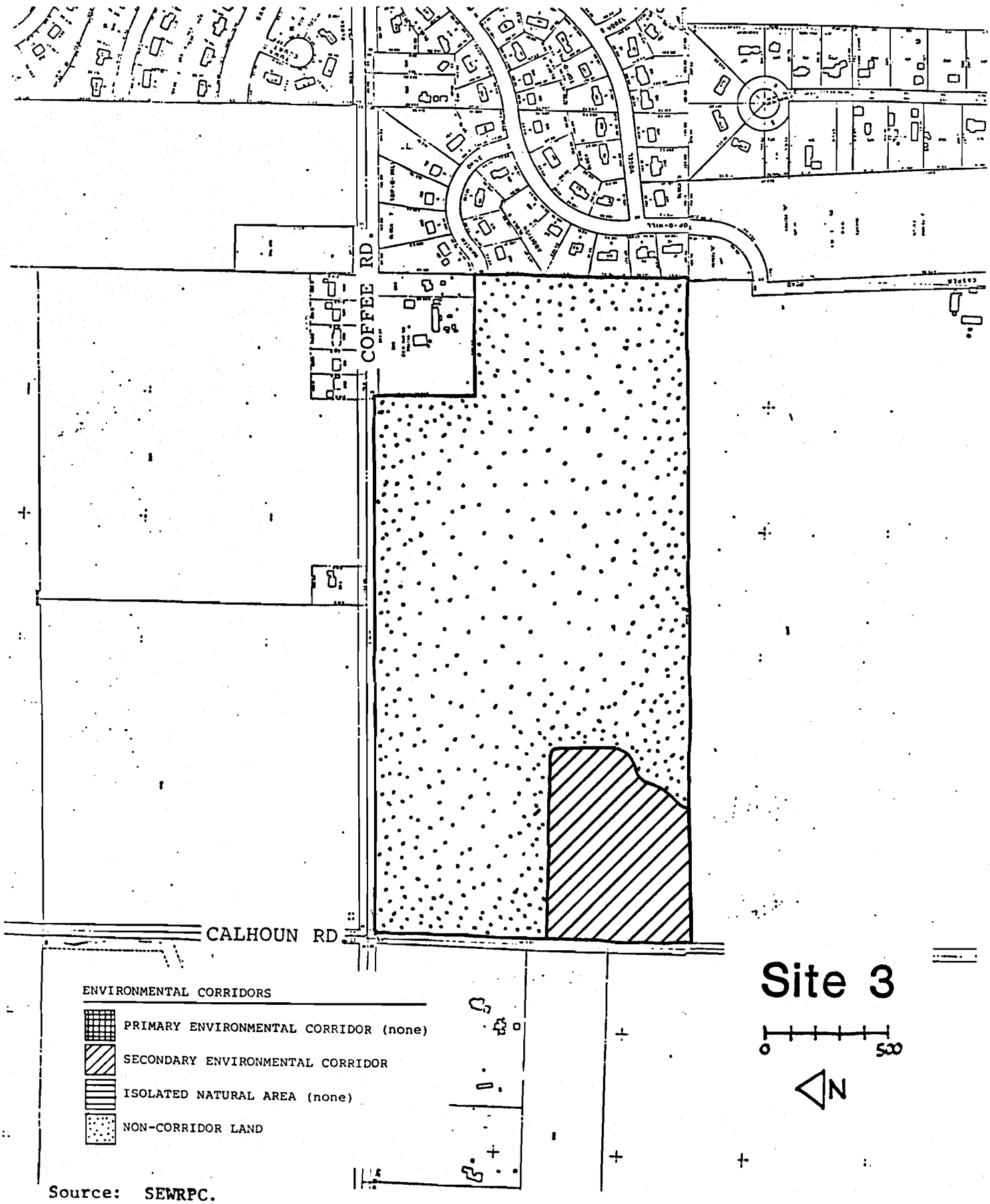
Table 14 lists and quantifies the soils types present on the site with respect to limitations for light industrial development. Soil types found at Site 3 include Tichigan silt loam, Bono silty clay loam (thin surface variant), Hochheim silt loam, Theresa silt loam, and Lamartine silt loam. Table 15 presents data pertaining to the areas of the site covered by each of the soil types which have exhibit severe or very severe limitations for light industrial buildings, and Figure 23 graphically illustrates the location of those soils. About 80 percent of Site 3 is covered by soils which pose severe limitations for this type of development, and thus the site is rated poor with respect to this characteristic.

Site Slope Compatibility With Use

Table 16 indicates that 62.4 acres, or about 87 percent, of the site has slopes of from 0 to 3 percent and that 9 acres, or about 13 percent, of the

Figure 22

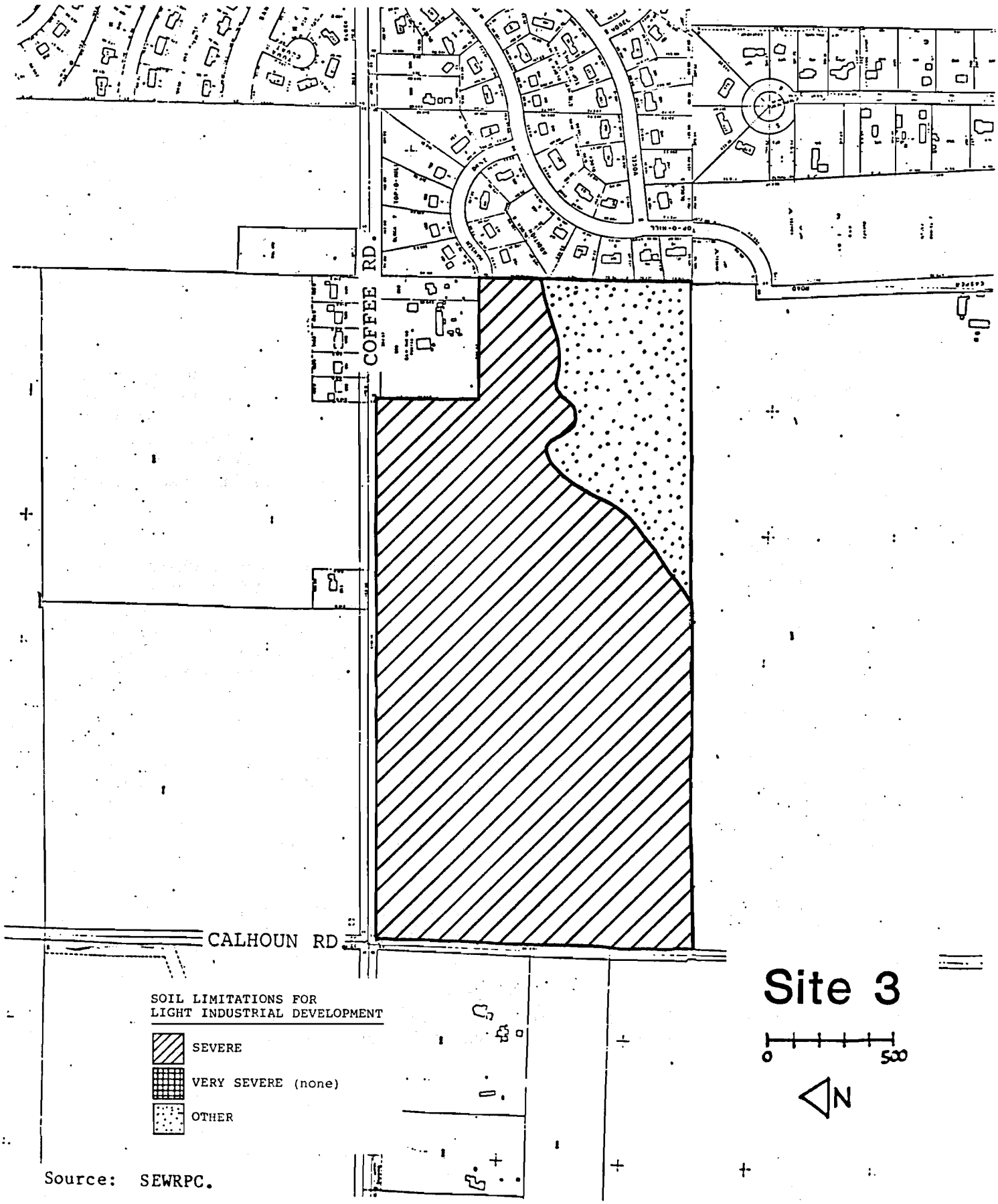
LOCATION OF ENVIRONMENTAL CORRIDORS AT ALTERNATIVE SITE 3



Source: SEWRPC.

Figure 23

LOCATION OF SOILS WITH LIMITATIONS
FOR INDUSTRIAL BUILDINGS AT ALTERNATIVE SITE 3



Source: SEWRPC.

site has slopes of from 7 to 11 percent. The site is rated as good with respect to this characteristic. The location of those slopes which range from 7 to 11 percent at Site 3 are graphically shown on Figure 24.

Zoning

Alternative Site 3 is currently in the R-2 Residential Zoning District and C-1 Conservancy District classifications. Public utility facilities, such as the central public works facility, are permitted as conditional uses within these districts. However, due to the dissimilarity of the central public works facility to the uses permitted in these two districts, the site is rated as fair with respect to zoning.

ALTERNATIVE SITE 4

Site Size, Location, and Proximity to Streets and Residential Areas Served

Alternative Site 4 is shown on Figure 25. The site is approximately 64.8 acres in area and is located about 700 feet southwest of the intersection of Calhoun Road and W. National Avenue on the northwest side of W. National Avenue in U. S. Public Land Survey Section 21. The site is within a 1½-mile radius of an optimal distance-minimizing location for the facility. The site is rated as fair with resect to proximity to the streets and land uses to be served.

Traffic Conflicts

Vehicular access to the site is provided by W. National Avenue which is a county trunk highway. In 1985, the average weekday traffic volume on W. National Avenue west of Calhoun Road was 7,820 vehicles. Good access to the site can be provided from W. National Avenue with minimal traffic conflicts potentially occurring due to vehicular left-turn movements to either enter the site from W. National Avenue from the southwest or to exit the site northeast bound onto W. National Avenue.

Compatibility With Neighboring Land Uses

The site is contiguous to the following land uses: north--one single-family residence and vacant lands; south--vacant lands, one single-family residence, and a business use; east--vacant lands, a school, and business uses; and west--grading and landscaping contractor building and yard and vacant lands. Compatibility with neighboring land uses is, therefore, good.

Man-Made and Natural Barriers

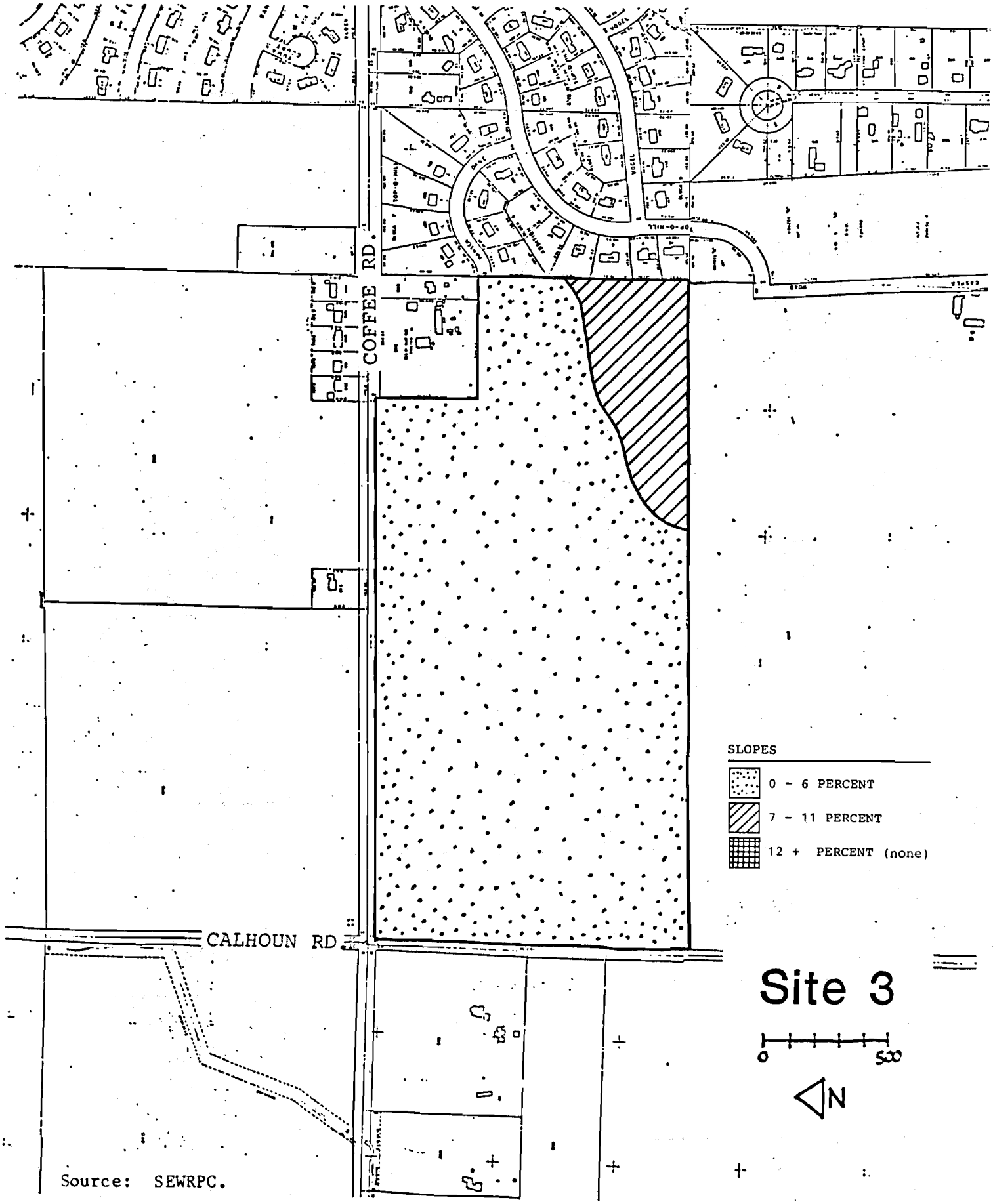
No significant man-made or natural barriers are located near the site to impede access to other areas of the City. Therefore, the site is rated as excellent for this characteristic.

Site Configuration and Expansion Capabilities

The site has an irregular shape. Since the site is over 64 acres in area, the site offers excellent facility expansion capabilities.

Figure 24

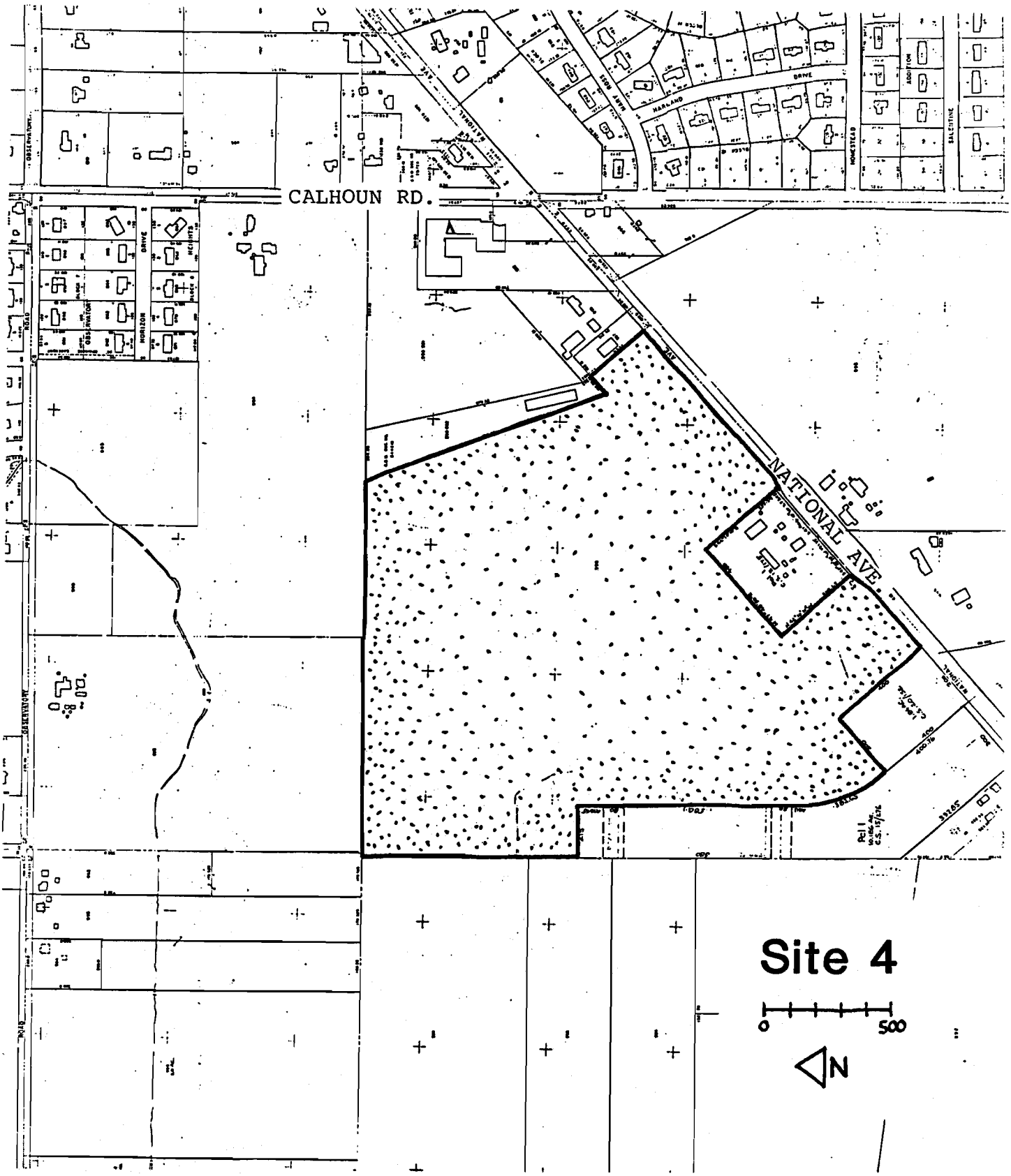
STEEP SLOPES AT ALTERNATIVE SITE 3



Source: SEWRPC.

Figure 25

ALTERNATIVE SITE 4



Source: SEWRPC.

Environmental Corridor Protection

About 12.6 acres, or about 19 percent of the total site area, are comprised of secondary environmental corridors as indicated earlier in Table 13, and graphically illustrated on Figure 26. There are no primary environmental corridors or isolated natural areas on the site. The site is thus rated as good with respect to this characteristic.

Conformance With the Adopted City Land Use and Urban Design Plan

The adopted City land use and urban design plan indicates that Site 4 be retained for rural estate residential, agricultural, secondary environmental corridor, recreation corridor/trail, and suburban residential development (1.5-acre to 5-acre lots) uses. A central public works facility at this site would be in conflict with the adopted plan.

Adequate Provision of Utilities (Sanitary Sewer and Water)

Based upon City of New Berlin Engineering Department analysis, approximately 4,750 linear feet of sanitary sewer and water main would have to be extended in order to service the site. The site is thus rated as poor with respect to this characteristic.

Soil Characteristics and Compatibility

Table 14 lists and quantifies the soil types present on the site with respect to limitations for light industrial development. Soil types found at Site 4 include Colwood silt loam, Kibbie silt loam, Tichigan silt loam, Brookston silt loam, Ehler silt loam, Kibbie find sandy loam, Hochheim silt loam, Theresa silt loam, Lamartine silt loam, and the Mequon silt loam. Table 15 presents data pertaining to the areas of the site covered by each of the soils types which have severe or very severe limitations for light industrial buildings, and Figure 27 graphically illustrates the location of those soils. About 56 percent of Site 4 is covered by soils which pose severe limitations for this type of development, and thus the site is rated as fair with respect to this characteristic.

Site Slope Compatibility With Use

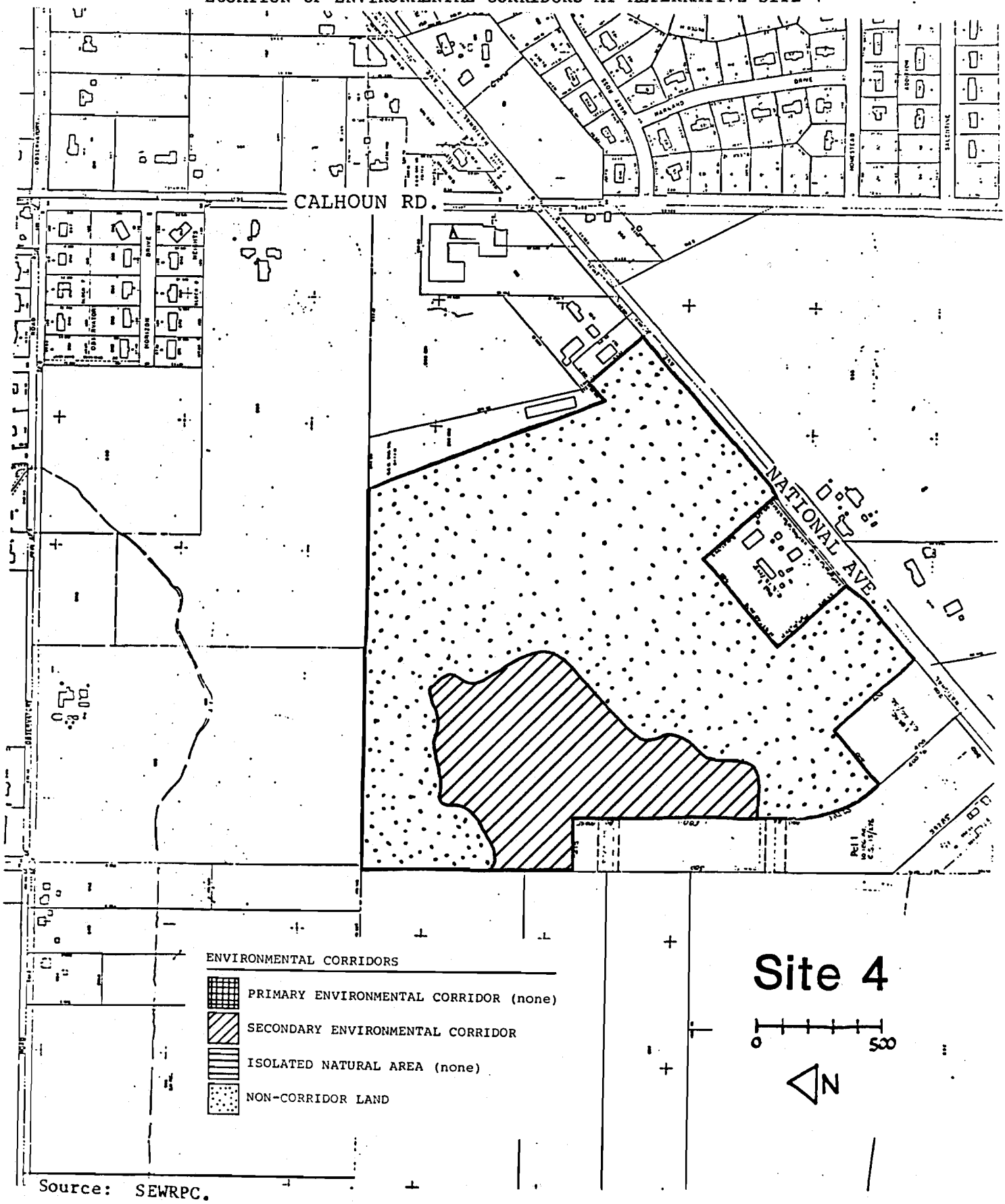
Table 16 indicates that 46.2 acres, or about 71 percent, of the site has slopes of from 0 to 3 percent; about 11 acres, or about 17 percent, from 4 to 6 percent slopes; and about 8 acres, or about 12 percent, from 7 percent or greater slopes. The site is rated as good with respect to this characteristic. The location of those slopes which are 7 percent or greater at Site 4 are illustrated in Figure 28.

Zoning

Alternative Site 4 is currently in the B-2 Local Business Zoning District and C-1 Conservancy District classifications. Public utility facilities, such as the central public works facility, are permitted as conditional uses within these districts. However, due to the dissimilarity of the central public works facility to the uses permitted in these two districts, the site is rated as fair with respect to zoning.

Figure 26

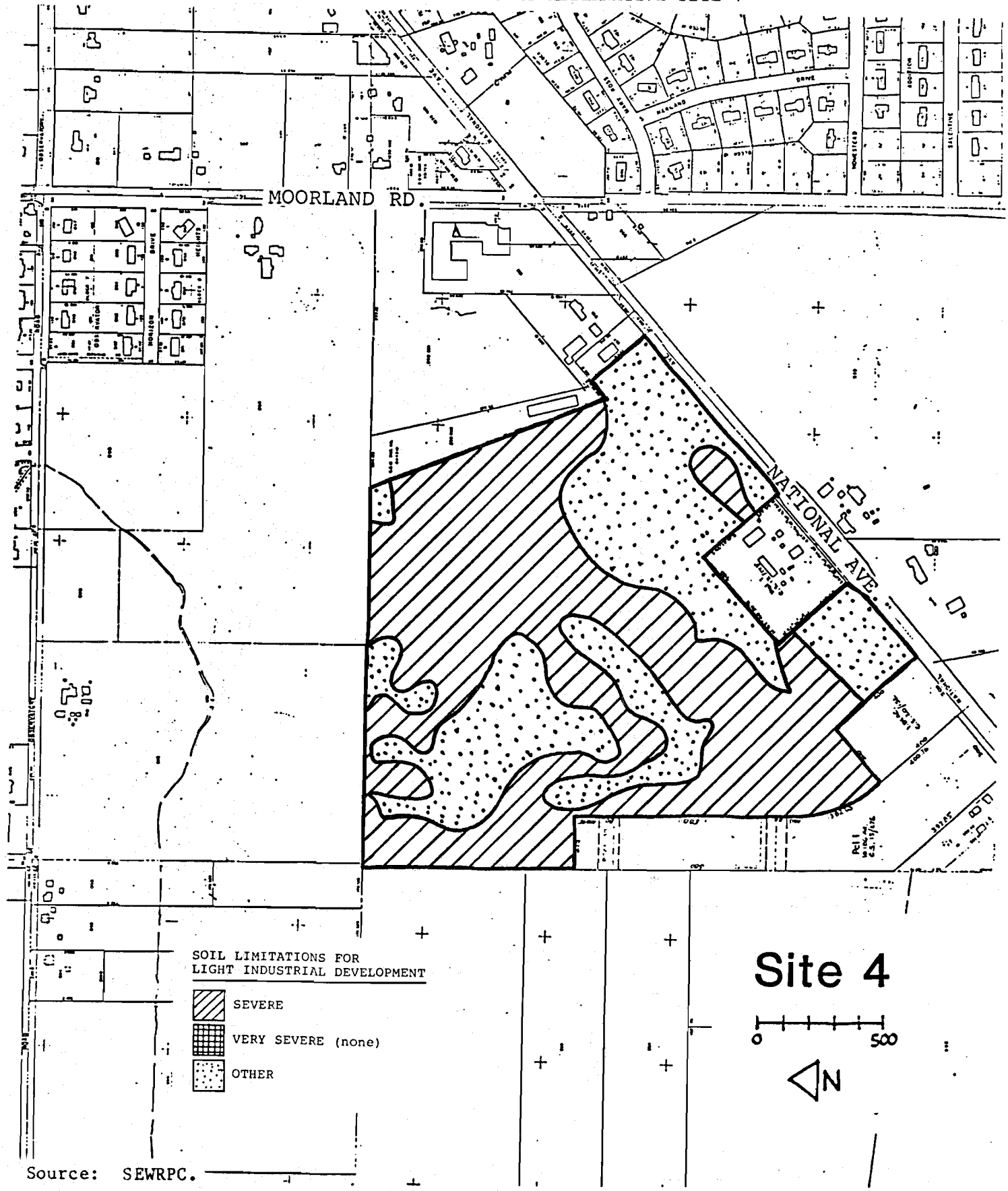
LOCATION OF ENVIRONMENTAL CORRIDORS AT ALTERNATIVE SITE 4



Source: SEWRPC.

Figure 27

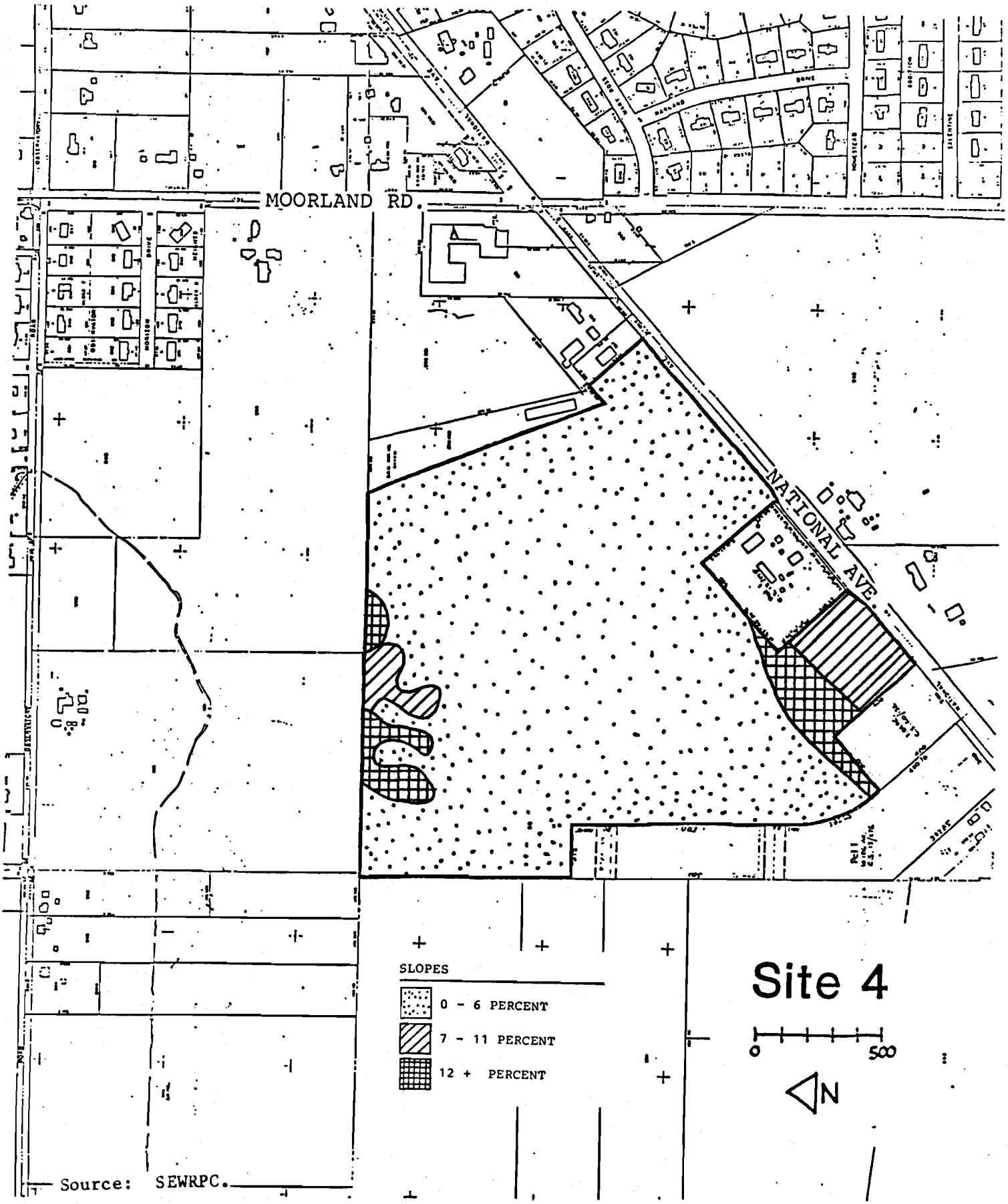
LOCATION OF SOILS WITH LIMITATIONS
FOR INDUSTRIAL BUILDINGS AT ALTERNATIVE SITE 4



Source: SEWRPC.

Figure 28

STEEP SLOPES AT ALTERNATIVE SITE 4



Source: SEWRPC.

ALTERNATIVE SITE 5

Site Size, Location, and Proximity to Streets and Residential Areas Served

Alternative Site 5 is shown on Figure 29. The site is approximately 29.4 acres in area and is located on the west side of Moorland Road approximately 300 feet south of Ryerson Road in U. S. Public Land Survey Section 10. The site is rated as good with respect to proximity to streets and land uses to be served.

Traffic Conflicts

Vehicular access to the site is provided by Moorland Road. Moorland Road is a county trunk highway. In 1985, the average weekday traffic volume on Moorland Road northbound south of Cleveland Avenue was 8,270 vehicles and southbound south of Cleveland Avenue was 7,980 vehicles. Fair access to the site can be provided from Moorland Road with potential traffic conflicts occurring due to vehicular left-turn movements to either enter the site from W. National Avenue or to exit the site northbound onto Moorland Road.

Compatibility With Neighboring Land Uses

The site is contiguous to the following land uses: north--industrial related uses; south--a single-family residential subdivision; east--vacant lands; and west--industrial related uses. Compatibility with neighboring land uses is, therefore, poor.

Man-Made and Natural Barriers

No significant man-made or natural barriers are located near the site to impede access to other areas of the City. Therefore, the site is rated as excellent for this characteristic.

Site Configuration and Expansion Capabilities

The site has an elongated rectangular shape. Although the property is over 29 acres in area, the parcel does not lend itself readily for onsite facility expansion due to both the space required to adequately buffer the facility from adjacent incompatible residential uses, as well as the lack of contiguous vacant lands into which the facility could expand. Therefore, the site is rated as fair for this characteristic.

Environmental Corridor Protection

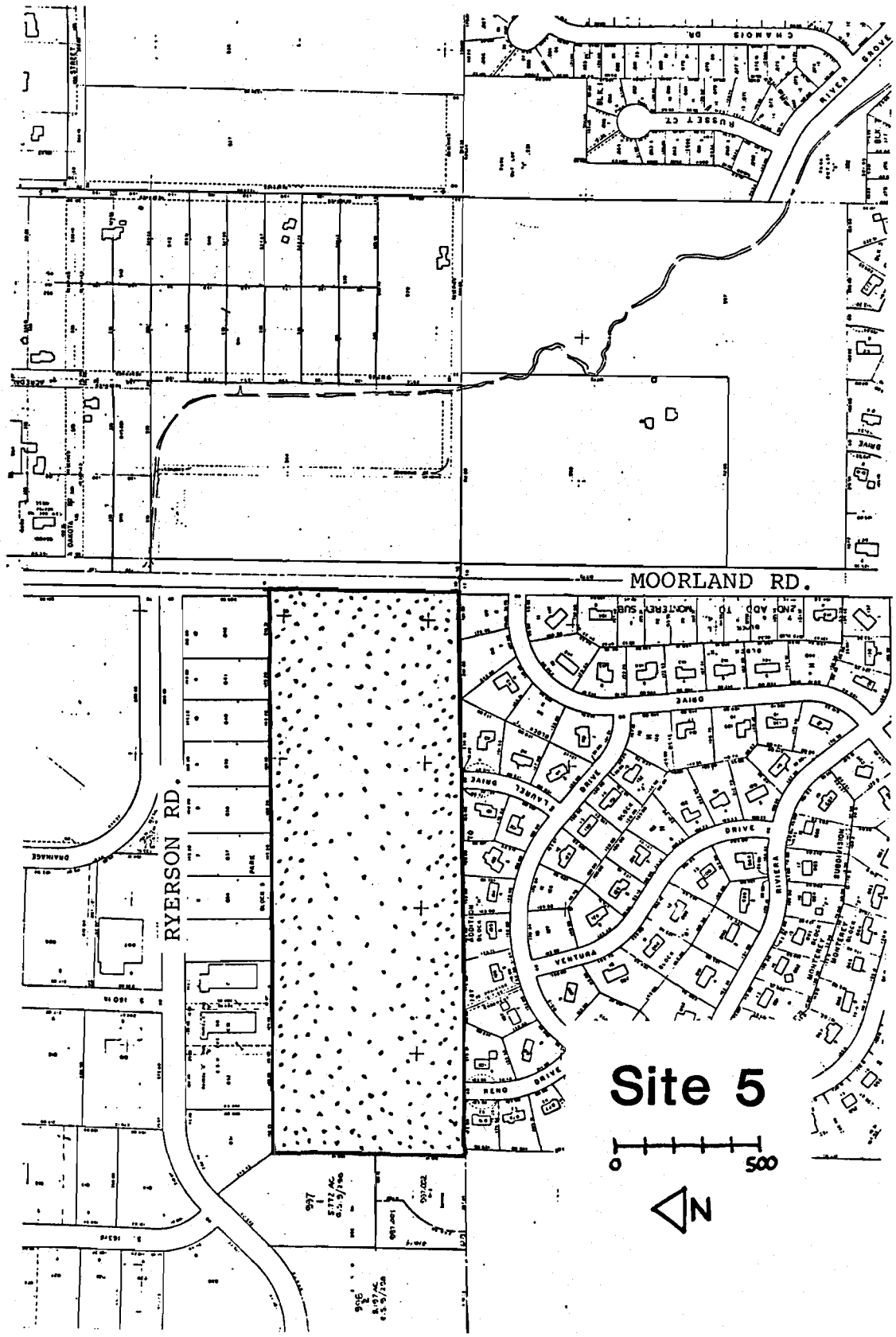
About 25.4 acres, or about 86 percent of the total site area, of secondary environmental corridors as indicated earlier in Table 13, and graphically illustrated on Figure 30. There are no primary environmental corridors or isolated natural areas on the site. The site is thus rated as poor with respect to this characteristic.

Conformance with the Adopted City Land Use and Urban Design Plan

The adopted City land use and urban design plan indicates that Site 5 be retained for secondary environmental corridor and that only a small portion of the site (about five acres, or 17 percent) located at the site's northwest corner be developed for light industrial uses. The construction of a public works facility at this site would be in conflict with the adopted plan.

Figure 29

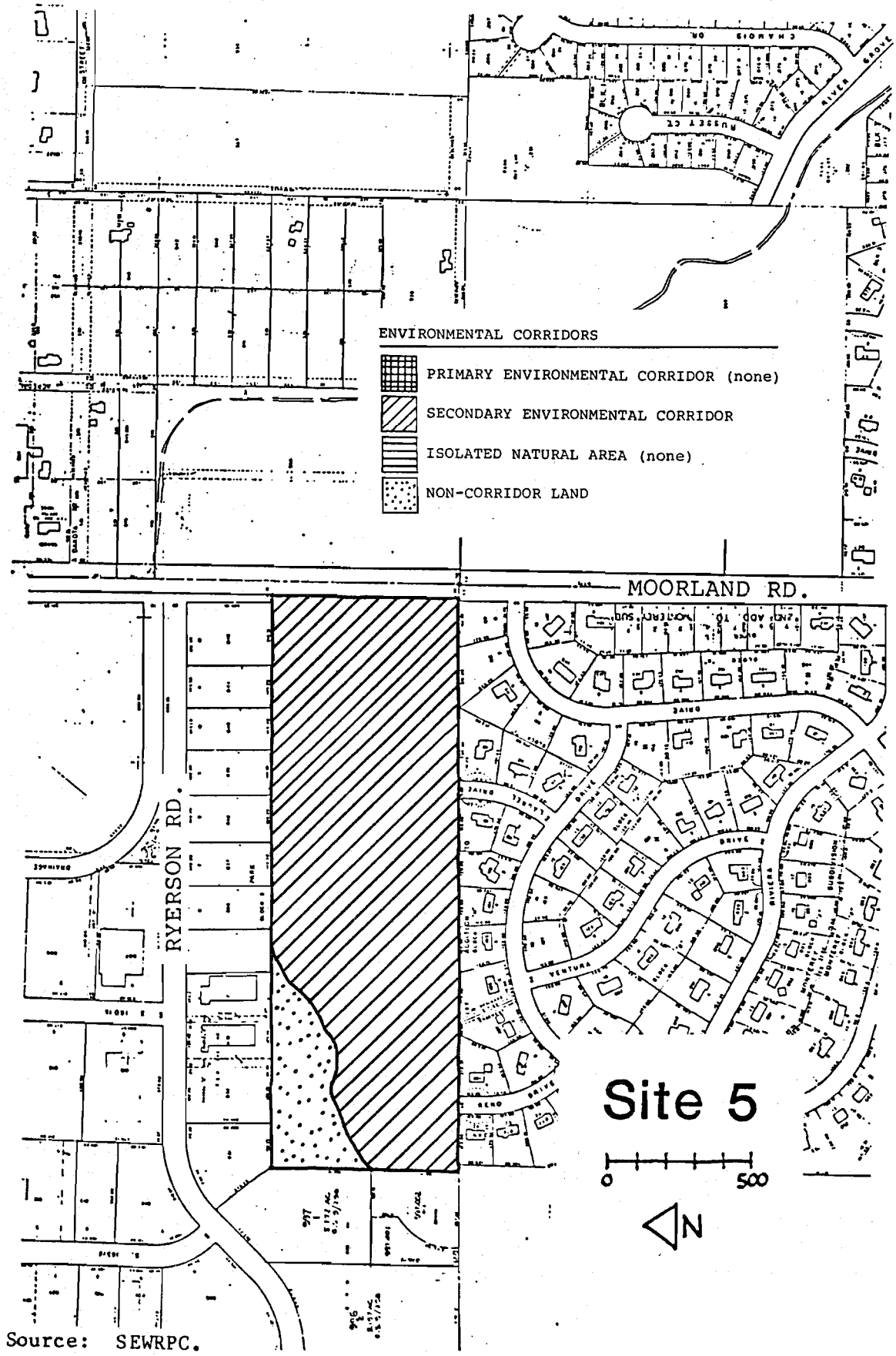
ALERNATIVE SITE 5



Source: SEWRPC.

Figure 30

LOCATION OF ENVIRONMENTAL CORRIDORS AT ALTERNATIVE SITE 5



Source: SEWRPC.

Adequate Provision of Utilities
(Sanitary Sewer and Water)
The site already is serviced by both sanitary sewer and public water supply. The site is rated excellent with respect to this characteristic.

Soil Characteristics and Compatibility
Table 14 lists and quantifies the soil types present on the site with respect to limitations for light industrial development. Soil types found at Site 5 include Saylesville loam, Tichigan silt loam, Bono silty clay loam, Bono silty clay loam (thin surface variant), Ozaukee silt loam, Mequon silt loam, and Ogden muck. Table 15 presents data pertaining to the areas of the site covered by each of the soil types which have severe or very severe limitations for light industrial buildings, and Figure 31 graphically illustrates the location of these soils. About 77 percent of Site 5 is covered by soils which pose severe and very severe limitations for this type of development, and thus the site is rated as poor with respect to this characteristic.

Site Slope Compatibility With Use
Table 16 indicates that 22.4 acres, or about 76 percent, of the site has slopes of from 0 to 3 percent and that 7 acres, or about 24 percent, of the site has slopes ranging from 4 to 6 percent. The site is rated as good with respect to this characteristic.

Zoning
Alternative Site 5 is currently in the R-2 Residential Zoning District, M-1 Limited Industrial District, and C-1 Conservancy District classifications. However, due to the dissimilarity of the central public works facility to the uses permitted in the R-2 and C-1 Districts, the site is rated as fair with respect to zoning.

ALTERNATIVE SITE 6

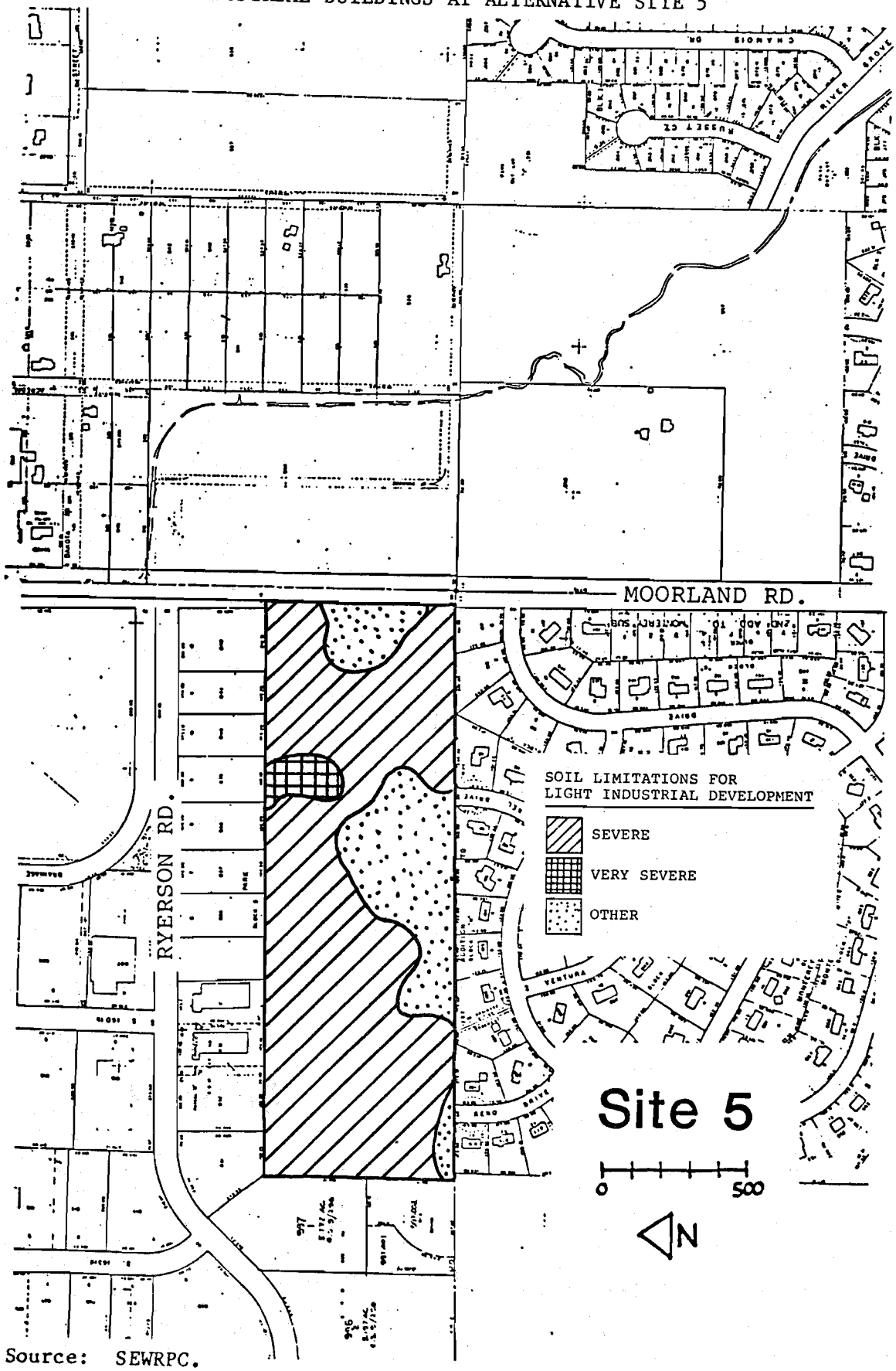
Site Size, Location, and Proximity to
Streets and Residential Areas Served
Alternative Site 6 is shown on Figure 32. The site is approximately 6.6 acres in area and is located on the east side of Sunny Slope Road near the intersection of Cleveland Avenue and Sunny Slope Road. This site is inadequate in size to accommodate the central public works facility spatial needs as described in Chapter IV. The site is deemed unsatisfactory and not considered further in this study.

COMPARATIVE NONECONOMIC SITE EVALUATIONS

The site selection process may be aided by comparing the various noneconomic criteria of the alternative sites. The noneconomic criteria were set forth in Chapter III and are listed in Table 17. The criteria are listed in rank order on a scale of from one to four in importance, with four representing the highest level of importance and one the lowest. A relative value has been assigned to each of the evaluation criteria and the sites scored. The scoring is based upon the degree to which the site was found to meet each criterion in relation to the other alternative sites being considered. A score of four is excellent; three good; two fair; one poor; and zero unsatisfactory. The score

Figure 31

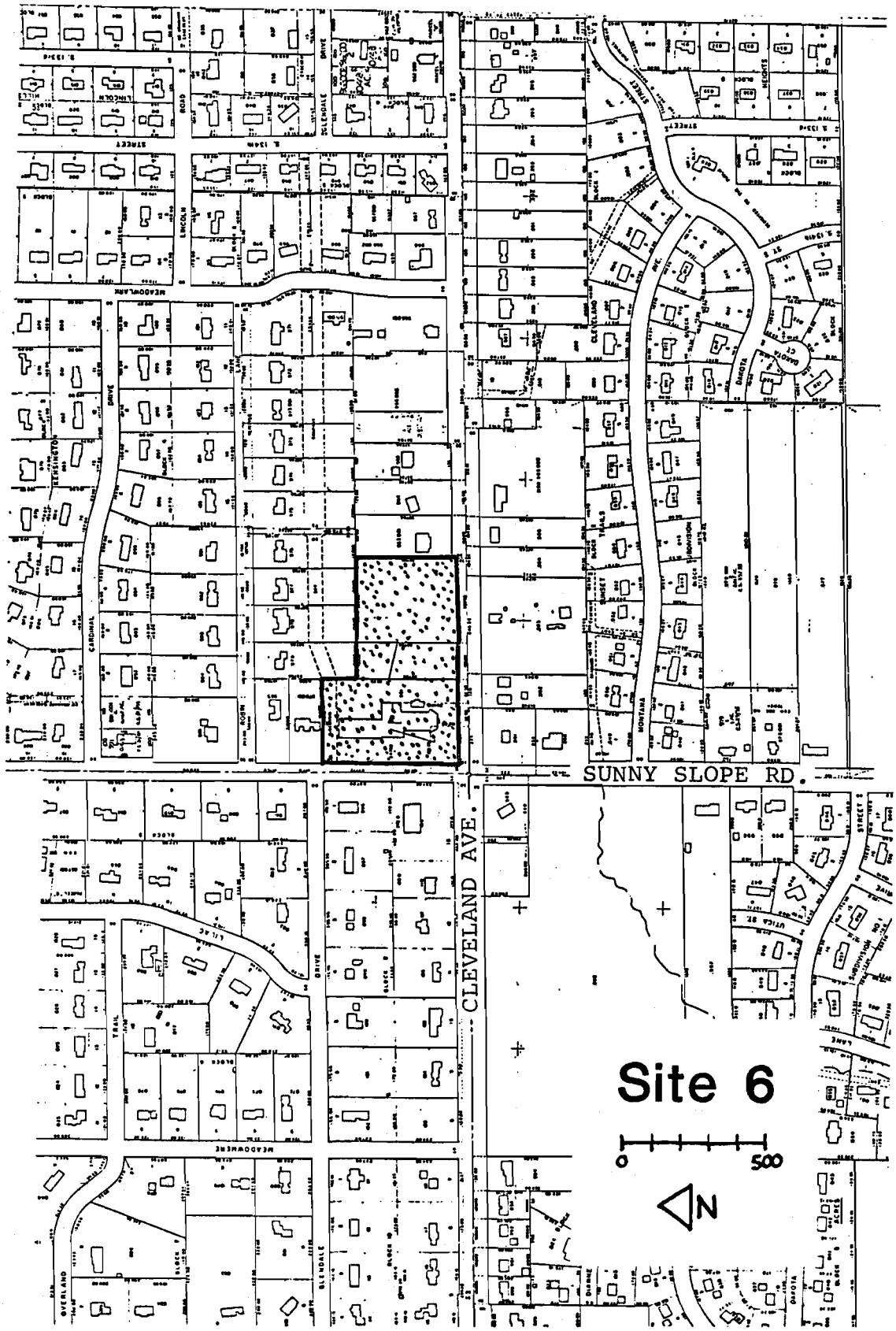
LOCATION OF SOILS WITH LIMITATIONS
FOR INDUSTRIAL BUILDINGS AT ALTERNATIVE SITE 5



Source: SEWRPC.

Figure 32

ALTERNATIVE SITE 6



Source: SEWRPC.

Table 17

COMPARATIVE NONECONOMIC PUBLIC WORKS FACILITY
SITE EVALUATION CRITERIA

Evaluation Criteria	Rank Order	Normalized Value
--Proximity to Streets and Residential Areas Serviced by Public Works and Municipal Solid Waste Collection Equipment	4.0	1.29
--Traffic Conflicts	3.7	1.20
--Compatibility With Neighboring Land Uses	3.6	1.17
--Man-Made and Natural Barriers	3.4	1.10
--Site Configuration and Expansion Capabilities	3.2	1.04
--Environmental Corridor Protection	3.0	0.97
--Conformance With the Adopted City Land Use and Urban Design Plan	2.7	0.87
--Adequate Provision of Utilities (Sanitary Sewer and Water)	2.3	0.74
--Soil Characteristics and Compatibility	2.0	0.65
--Site Slope Compatibility With Use	2.0	0.65
--Zoning	1.0	0.32
Total	30.9	10.00

Source: SEWRPC.

for each of the site evaluation criteria was then multipled by a normalization factor as set forth in Table 17 to obtain a normalized score for each criterion. The normalized scores for all of the site evaluation criteria for each site were then summed and an overall score for each alternative site obtained. The results of this comparative evaluation process are given in Table 18. The site with the highest score is considered the most suitable site for the central public works facility.

THE RECOMMENDED CENTRAL PUBLIC WORKS FACILITY SITE

A rank order listing of all five alternative sites considered, based upon the comparative evaluation of the sites, is shown in Table 19. The site which scored the highest is Site 1, located on the northeast corner of the intersection of Calhoun Road with Coffee Road. The site which scored the second highest is Site 3, located on the southeast corner of the intersection of Calhoun Road with Coffee Road. The site which scored the third highest was Site 2, located at the northwest corner of the intersection of Calhoun Road with Coffee Road. Based upon the evaluation, the site recommended for the new central public works facility by the Commission staff is Site 1.

Subsequent to the analyses prepared relative to the alternative sites studied in this chapter, the Commission staff also examined two additional sites as potential locations for the new central public works facility. The analysis of these two additional sites is presented in Appendix A of this memorandum. The results of that additional analysis further supported Site 1 as the site recommended for the new central public works facility.

PJM/ea
9/11/86
IE010E/I

Table 18

COMPARATIVE NONECONOMIC PUBLIC WORKS FACILITY SITE EVALUATION FOR ALTERNATIVE CENTRAL PUBLIC WORKS SITES IN THE CITY OF NEW BERLIN

Evaluation Criteria	Normalizing Factor	Site 1		Site 2		Site 3		Site 4		Site 5	
		Score	Normalized Score	Score	Normalized Score	Score	Normalized Score	Score	Normalized Score	Score	Normalized Score
--Proxomity to Streets and Residential Areas Serviced by Public Works and Municipal Solid Waste Collection Equipment	1.29	4	5.16	3	3.87	4	5.16	2	2.58	3	3.87
--Traffic Conflicts	1.20	4	4.80	4	4.80	4	4.80	3	3.60	2	2.40
--Compatibility With Neighboring Land Uses ..	1.17	4	4.68	4	4.68	2	2.34	3	3.51	1	1.17
--Man-Made and Natural Barriers	1.10	4	4.40	2	2.20	4	4.40	4	4.40	4	4.40
--Site Configuration and Expansion Capabilities	1.04	4	4.16	4	4.16	4	4.16	4	4.16	2	2.08
--Environmental Corridor Protection	0.97	3	2.91	2	1.94	3	2.91	3	2.91	1	0.97
--Conformance With the Adopted City Land Use and Urban Design Plan	0.87	4	3.48	--	--	--	--	--	--	--	--
--Adequate Provision of Utilities (Sanitary Sewer and Water)	0.74	1	0.74	1	0.74	1	0.74	1	0.74	4	2.96
--Soil Characteristics and Compatibility	0.65	1	0.65	1	0.65	1	0.65	2	1.30	1	0.65
--Site Slope Compatibility With Use	0.65	4	2.60	4	2.60	3	1.95	3	1.95	3	1.95
--Zoning	0.32	4	1.28	2	0.64	2	0.64	2	0.64	2	0.64
Total	10.00	37	34.86	27	26.28	28	27.75	27	25.79	23	21.09

NOTE: The following scale was used for each score assigned:
4 = Excellent
3 = Good
2 = Fair
1 = Poor
0 = Unsatisfactory

Source: SEWRPC.

PJM/ea
9/4/86
IE010E/J

Table 19

RANK ORDER LISTING OF THE ALTERNATIVE CENTRAL PUBLIC WORKS FACILITY SITES BASED UPON THE NONECONOMIC SITE EVALUATION

Rank Order	Normalized Score	Alternative Site
1	34.86	1
2	27.75	3
3	26.28	2
4	25.79	4
5	21.09	5

Source: SEWRPC.

Chapter VI

CENTRAL PUBLIC WORKS FACILITY SITE PLAN DESIGNS FOR THE RECOMMENDED SITE

INTRODUCTION

This chapter presents two alternative site plans for the central public works facility site recommended in Chapter V. The alternative site plans are based, in part, upon consideration of existing site characteristics, the site design criteria presented in Chapter III, and the functional requirements of the facility as outlined in Chapter IV.

PREDEVELOPMENT CONDITIONS ANALYSES FOR THE RECOMMENDED SITE

In Chapter V, the existing conditions of the recommended central public works facility site--Site 1--were described and pertinent information was presented on site size, location, proximity to streets and residential areas served, traffic conflicts, compatibility with neighboring land uses, man-made and natural barriers, site configuration and expansion capabilities, environmental corridor protection, conformance with the adopted City land use plan, adequate provision of public sanitary sewer and water supply facilities, soil characteristics and compatibility, site slope compatibility, and zoning. Figure 33 presents a detailed graphic analysis of how these salient conditions affect the development of a site plan for the site. Also taken into consideration in this analysis are some of the site design criteria set forth in Chapter III of this report. Figure 33 indicates the development constraints imposed by the location of wetlands; delineated secondary environmental corridors; drainage patterns; required building setback lines; suitable areas for vehicular egress and ingress; and the location of proposed street right-of-way lines.

INITIAL RECOMMENDED CENTRAL PUBLIC WORKS FACILITY SITE PLAN FOR THE RECOMMENDED SITE

A site plan for the central public works facility was prepared which was both responsive to the program for the facility as outlined in Chapter IV, and the site design criteria outlined in Chapter III. The plan is illustrated in Figure 34.

The site plan provides for a central public works facility complex with six buildings: 1) a public works vehicle and material storage building; 2) a public works vehicle maintenance building; 3) a public works administration building; 4) a solid waste collection and transportation service building; 5) a solid waste transfer facility; and 6) a street salt storage building--housing the major structurally enclosed facilities. In addition, the site plan illustrates the major outdoor and site-related functional spaces which include off-street motor vehicle parking areas; waste processing facility area; waste separation and recycling facility area; material storage area; vehicle queueing areas; vehicle circulation areas; landscaping areas; and required setback areas. These enclosed and outdoor spaces are functionally organized as recommended earlier in Chapter IV.

The site plan provides for a two phase construction program--Phase I for building and outdoor space needs to the year 2000; and Phase II for building and outdoor space needs to the year 2010. Phase I would include the construction of the public works administration building; the public works vehicle and material storage building; the street salt storage shed; the public works vehicle maintenance building; and appurtenant off-street motor vehicle parking and equipment storage and service areas; the outdoor compost processing facility area; the waste separation and recycling collection facility area; the outdoor material storage area; and appurtenant motor vehicle circulation, landscaping, and setback areas.

Phase II would expand the public works vehicle and material storage building; the street salt storage building; and the public works vehicle maintenance building; and provide for a new solid waste collection and transportation services building; a new solid waste transfer facility building; additional off-street parking and vehicle equipment storage areas; new outdoor solid waste transfer facility vehicle queueing areas; and additional motor vehicle circulation and landscaping areas. All existing wetlands on the site would be preserved and used to act as a buffer for the facility. The site also provides for the sale of five lots for industrial-related purposes, ranging in size from one to one-and-one-half acres and fronting on the Calhoun Road right-of-way.

The site plan indicates two functionally separate circulation systems--one for trucks and one for automobiles. A truck drive and an automobile drive are served by Calhoun Road and another similar pair of drives are served by Coffee Road. The organization of the circulation system in this fashion minimizes internal vehicular traffic conflicts.

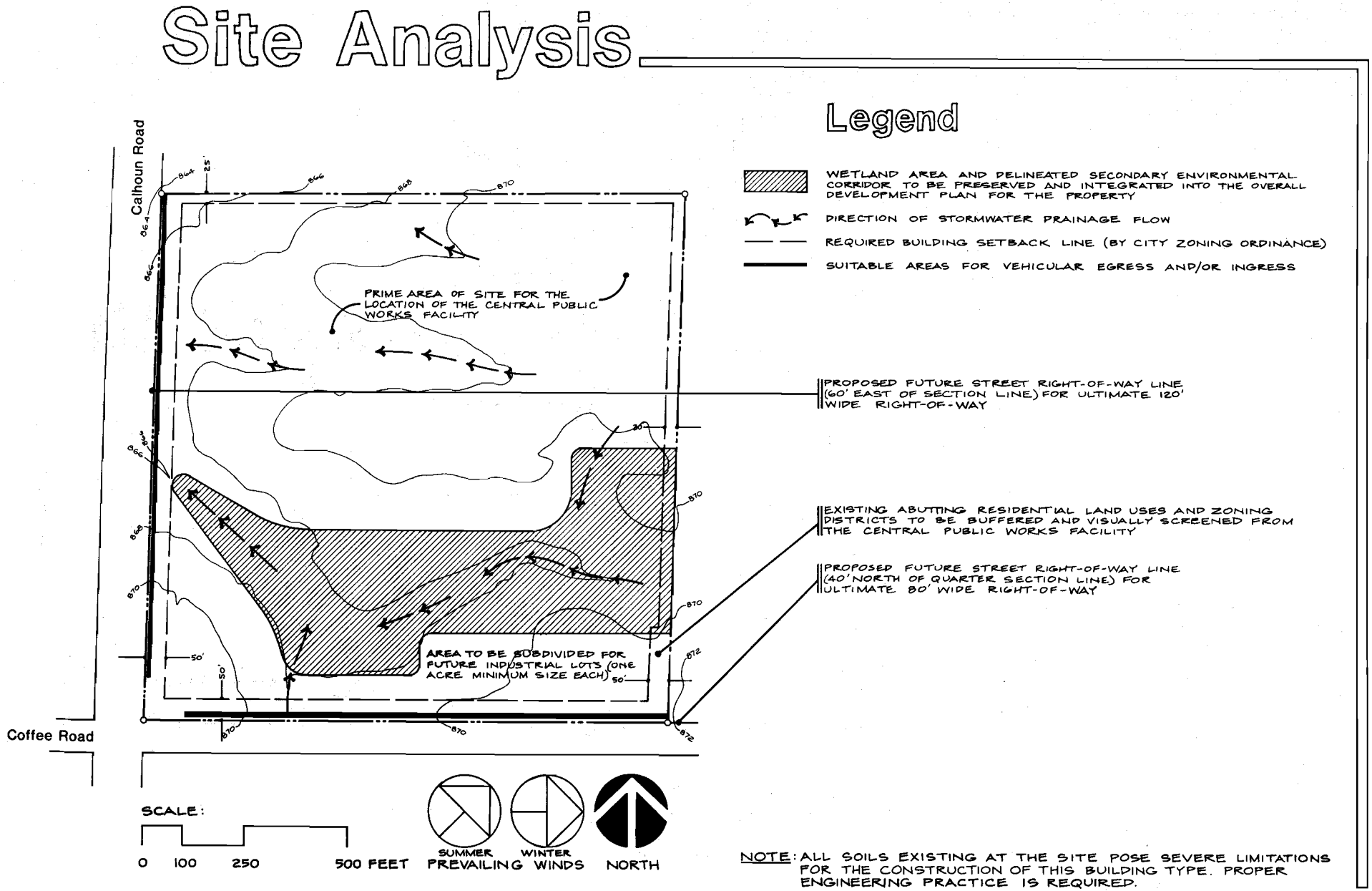
The public works vehicle and material storage and administration buildings are oriented on the site so as to be visually prominent and to assist in visually screening the more utilitarian buildings and operational characteristics of the site. Buildings are oriented on the site with the long axes in an east-west direction in order to minimize the adverse impact of westerly winter winds and maximize winter solar exposure. All building locations afford adequate space to accommodate some additional building expansion to meet needs beyond the year 2010.

Landscaping at the site would consist of a variety of plant material types including shade trees; tree planting screens; specimen-ornamental trees; upright coniferous trees and shrubs; and horizontal coniferous shrubs. The plant materials would be used in conjuction with earth berms in areas where landscape screening is necessary in order to buffer neighboring land uses, as well as incompatible land uses located on the site itself.

The site may be secured at all four proposed driveway entrances while providing vehicular access to the waste separation and recycling collection facility. If deemed necessary, that facility may also be secured. The placement of the waste separation and recycling collection facility along the Coffee Road right-of-way will facilitate ease of access by resident users. This location will avoid the need for users to go through the entire public works facility site before getting to the waste recycling facility, and thereby will minimize

Figure 33

ANALYSIS OF THE RECOMMENDED CENTRAL PUBLIC WORKS
FACILITY SITE PREDEVELOPMENT CONDITIONS

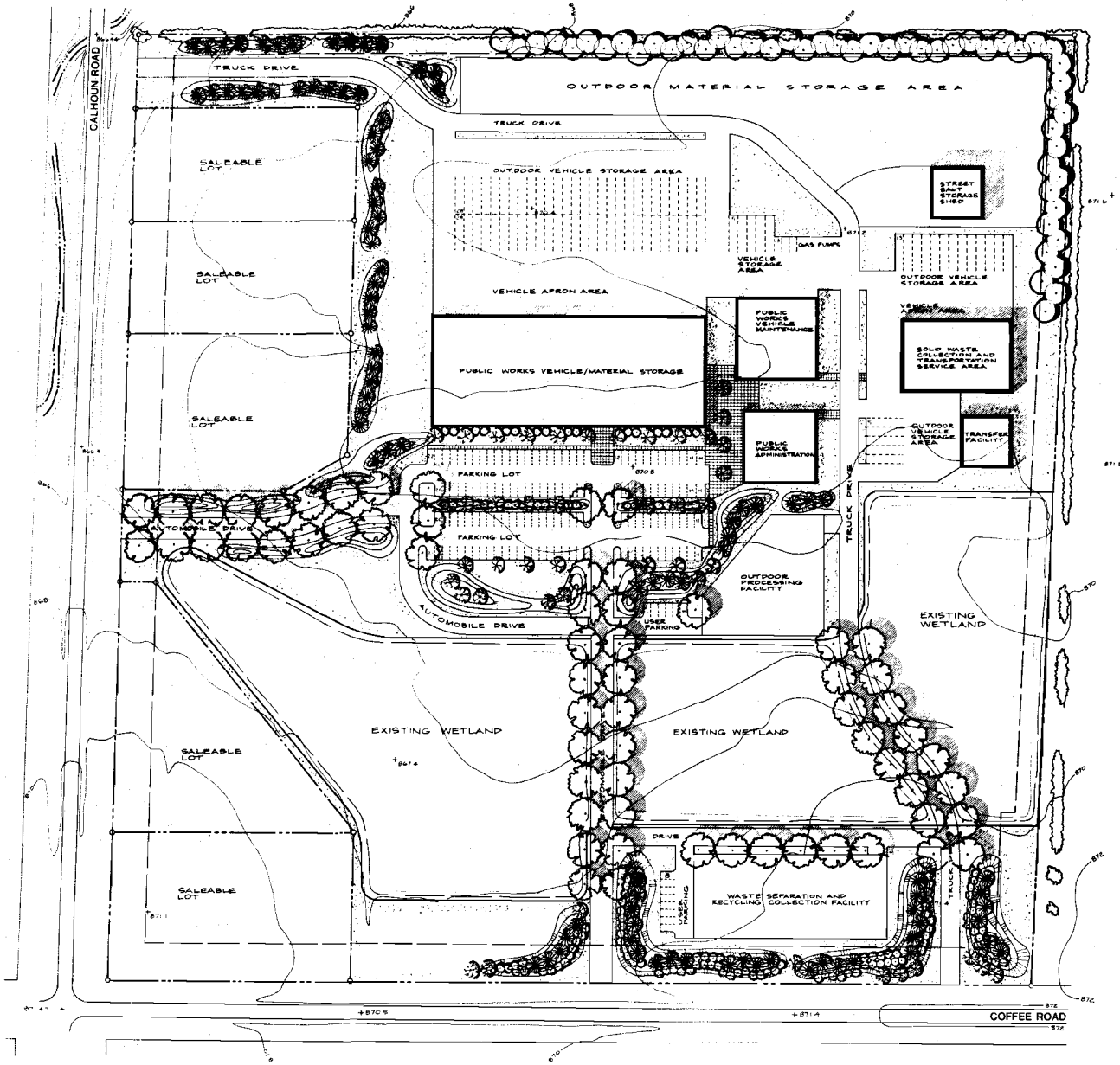


Prepared by the Southeastern Wisconsin Regional Planning Commission

September 1986

Figure 34

INITIAL RECOMMENDED CENTRAL PUBLIC WORKS FACILITY
SITE PLAN FOR THE RECOMMENDED SITE



City of New Berlin Central Public Works Facility

LEGEND

- Existing and Proposed Property Boundary Lines
- Minimum Required Setback Lines
- Existing Contour Lines (2' Contour Interval)
- Existing Spot Elevation
- Existing Wetland Area
- Building
- Paving
- Walkways
- Outdoor Use Area
- Grass Ground Cover and Open Space
- Earth Berm
- Significant Existing Vegetation
- Shade Tree
- Tree Planting Screen
- Specimen/Ornamental Tree
- Upright Coniferous Tree or Shrub
- Horizontal Coniferous Shrub

NOTE: SECURITY GATES ARE TO BE INSTALLED AT EACH OF THE FOUR VEHICULAR ENTRANCES TO THE FACILITY.

Scale: 0 50 100 250 Feet

Prepared by the Southeastern Wisconsin Regional Planning Commission

December 1986

potential user automobile and truck vehicle conflicts. Due to the layout of the buildings on the site, the more private truck-oriented facilities can be easily secured from the more public-oriented portions of the site.

LOCALLY PREFERRED CENTRAL PUBLIC WORKS FACILITY SITE PLAN FOR THE RECOMMENDED SITE

Based upon City of New Berlin Public Works Department participation in the site planning process, the initially recommended central public works facility site plan was modified. The locally preferred site plan for the central public works facility is illustrated in Figure 35.

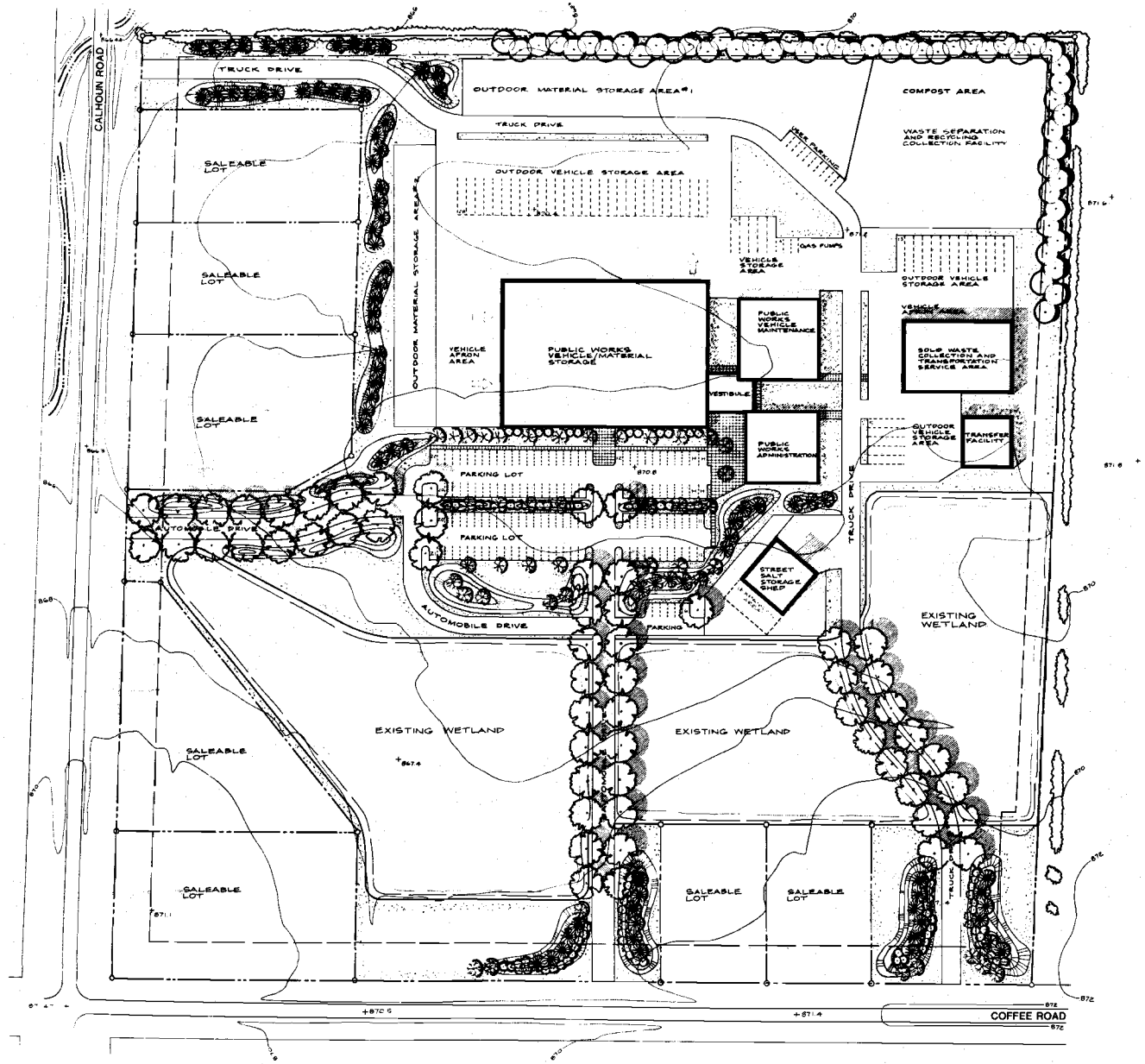
The locally preferred site plan provides for a central public works facility complex with four buildings: 1) a combined public works vehicle and material storage, vehicle maintenance, and administration building; 2) a solid waste collection and transportation service building; 3) a solid waste transfer facility; and 4) a street salt storage shed building--housing the major structurally enclosed facilities. As in the initially recommended site plan, the locally preferred site plan provides for outdoor and site-related functional spaces which include off-street motor vehicle parking; solid waste processing facility area; solid waste separation and recycling collection facility area; material storage and vehicle queueing areas; motor vehicle circulation areas; landscaping areas; and required setback areas.

The site plan also provides for a two-phase construction program--Phase I for building and outdoor space needs to the year 2000; and Phase II for building and outdoor space needs to the year 2010. Phase I would include the construction of the combined public works vehicle and material storage, vehicle maintenance, and administration building; street salt storage shed; public works vehicle maintenance building; off-street motor vehicle parking and vehicular equipment storage and service areas; solid waste processing facility area; solid waste separation and recycling collection facility area; outdoor material storage area; motor vehicle circulation areas; landscaping areas; and setback areas. As in the initially recommended site plan, the locally preferred site plan calls for the expansion of the public works vehicle and material storage area; the street salt storage shed building; and the public works vehicle maintenance area under Phase II. That plan would also provide a new solid waste collection and transportation services building; a new solid waste transfer facility building; additional off-street parking and vehicle equipment storage space; a new outdoor transfer facility vehicle queueing area, and additional circulation and landscaping areas. All existing wetlands at the site would be preserved and used to buffer the facility from adjacent land uses. The site plan further provides for the sale of seven lots for industrial-related purposes, with the lots ranging in size from 29,000 to about 65,000 square feet in area, and fronting on Calhoun Road and Coffee Street.

Like the initially recommended site plan, the locally preferred site plan functionally separates the circulation system into two systems--one for trucks and one for automobiles. A truck drive and an automobile drive are served by Calhoun Road and another similar pair of drives are served by Coffee Road. The organization of the circulation system in this fashion minimizes internal vehicular traffic conflicts. However, unlike the initially recommended plan,

Figure 35

LOCALLY PREFERRED CENTRAL PUBLIC WORKS FACILITY SITE PLAN FOR THE RECOMMENDED SITE



City of New Berlin Central Public Works Facility

LEGEND

- Existing and Proposed Property Boundary Lines
- Minimum Required Setback Lines
- Existing Contour Lines (2' Contour Interval)
- Existing Spot Elevation
- Existing Wetland Area
- Building
- Paving
- Walkways
- Outdoor Use Area
- Grass Ground Cover and Open Space
- Earth Berm
- Significant Existing Vegetation
- Shade Tree
- Tree Planting Screen
- Specimen/Ornamental Tree
- Upright Coniferous Tree or Shrub
- Horizontal Coniferous Shrub

NOTE: SECURITY GATES ARE TO BE INSTALLED AT EACH OF THE FOUR VEHICULAR ENTRANCES TO THE FACILITY

Scale: 0 50 100 250 Feet

Prepared by the Southeastern Wisconsin Regional Planning Commission

December 1986

the locally preferred plan calls for the placement of the waste separation and recycling collection facility in the northeast corner of the site which will require the citizen users of that facility to pass through the circulation areas used to service the solid waste collection and transportation service and transfer facility areas.

The public works vehicle and material storage, maintenance, and administration complex is oriented on the site so as to be visually prominent and to assist in visually screening the more utilitarian buildings and operational characteristics of the site. Buildings are also oriented on the site with the long axes in an east-west direction in order to minimize the adverse impact of westerly winter winds. All building locations afford adequate space to accommodate some additional building expansion to meet needs beyond the year 2010.

As in the initially recommended site plan for the facility, landscaping at the site would use a variety of plant material types including shade trees; tree planting screens; specimen-ornamental trees; upright coniferous trees and shrubs; and horizontal coniferous shrubs. The plant materials would also be used in conjunction with the use of earth berms in areas where landscape screening is necessary in order to buffer low-intensity and high-intensity land uses located on the site itself.

The site may be secured at all four drives. Due to the layout of the buildings on the site, the more private truck-oriented facilities can be secured from access from the more public-oriented portions of the site.

(This page intentionally left blank)

Chapter VII

CENTRAL PUBLIC WORKS FACILITY COST ESTIMATE ANALYSIS

INTRODUCTION

For the purposes of this study, the cost of the development of the central public works facility was considered under three categories: 1) land costs; 2) the costs associated with providing necessary utilities, such as public sanitary sewer and public water supply service to the site; and 3) the construction costs associated with building the facility at the site selected. This chapter presents an analysis of each of these categories of costs.

ASSESSED REAL PROPERTY VALUES OF THE ALTERNATIVE CENTRAL PUBLIC WORKS FACILITY SITES CONSIDERED

Table 19 presents the assessed values of the six alternative central public works facility sites considered. Although the assessed valuation is intended to be equal to full market value, for various reasons the assessed valuation may, in fact, vary from the full market value. It is, therefore, recommended that the City of New Berlin have an appraisal made of the site it ultimately selects for the central public works facility, if that site is not already owned by the City. Land value per net acre for the six sites--based upon the assessed valuation--varied from about $763 to $2,687. The recommended site, had an assessed value of $2,528 per net acre.

COSTS ASSOCIATED WITH THE EXTENSION OF PUBLIC SANITARY SEWER AND WATER SERVICE TO THE ALTERNATIVE CENTRAL PUBLIC WORKS FACILITY SITES CONSIDERED

Table 20 presents comparative cost estimates prepared by the City of New Berlin Engineering Department in late 1985 for the extension and construction of both public sanitary sewer and public water supply facilities to each of the alternative central public works facility sites under consideration. The sites with the lowest total cost for extension of public sanitary sewer service and public water supply service to the property boundary, are alternative sites 5 and 6, and alternative sites 1 and 3.

Appendix B provides more detailed cost data relating to the extension of public sanitary sewer and water supply service to the alternative sites considered.

1985 PUBLIC WORKS FACILITY BUILDING COST DATA FOR THE GREATER MILWAUKEE AREA

Table 21 provides 1985 square-foot cost data for the construction of public works facilities and similar building types in the greater Milwaukee area. The costs shown in Table 21 were derived, in part, from the publication Means Building Construction Cost Data 1985 published by the Robert Snow Means Company, Inc., with the Means Data Bank of Construction Costs adjusted to January 1, 1985, for the greater Milwaukee area. For the purposes of this study, the median construction costs per square foot were used, exclusive of any site preparation costs or architectural fees.

Table 19

ASSESSED REAL PROPERTY VALUES OF
THE ALTERNATIVE CENTRAL PUBLIC WORKS FACILITY
SITES IN THE CITY OF NEW BERLIN: 1986

Alternative Site	Assessed Valuation of Real Property		
	Land	Improvements	Total
1	$93,519.28	$ --	$ 93,519.28
2	28,712.06	--	28,712.06
3	69,606.23	--	69,606.23
4	21,903.20	152,214.92	174,118.12
5	72,764.56	--	72,764.56
6[a]	--	--	--

[a]Public ownership, not assessed for tax purposes.

Source: City of New Berlin and SEWRPC.

Table 20

COST OF THE
EXTENSION OF PUBLIC SANITARY SEWER
AND PUBLIC WATER SUPPLY SERVICE TO
EACH OF THE ALTERNATIVE CENTRAL
PUBLIC WORKS FACILITY SITES: 1985

Alternative Site	Public Sanitary Sewer	Public Water Supply	Total
1	$194,925	$135,010	$329,935
2	234,635	125,580	361,215
3	194,925	135,010	329,935
4	143,175	259,500	402,675
5	0[a]	0[a]	0[a]
6	0[a]	0[a]	0[a]

[a]The site currently has this utility already available to it.

Note: See Appendix B of this study for a detailed cost estimate analysis prepared by the City of New Berlin Engineering Department.

Source: City of New Berlin Engineering Department.

Table 21

SQUARE-FOOT CONSTRUCTION COST DATA FOR THE CONSTRUCTION OF MUNICIPAL GARAGES AND RELATED FACILITIES IN THE GREATER MILWAUKEE AREA: 1985

Building Area	Cost per Square Foot[a]		
	1/4	Median	3/4
Public Works Administration	$39.52	$50.72	$67.11
Public Works Vehicle and Material Storage	25.23	36.58	55.04
Street Salt Storage Shed(s)	17.62	24.42	37.72
Public Works Vehicle Maintenance	24.75	40.86	54.23
Solid Waste Collection and Transportation Service Area	26.72	38.77	58.32
Transfer Facility	27.82	40.35	60.69

[a]The costs were derived from the Means Data Bank of Construction Costs adjusted to January 1, 1985, and from the size of the building(s) proposed for the City of New Berlin and associated costs for the greater Milwaukee area. Twenty-five percent of the projects have lower costs than those listed in the "1/4" cost column, and 75 percent have higher; 75 percent of the projects have lower costs than those listed in the "3/4" column and 25 percent have higher; 50 percent of the projects have lower costs than those listed in the "median" column and 50 percent have higher.

Source: Means Building Construction Cost Data: 1985 (Kingston, Massachusetts: Robert Snow Means Company, Inc., 1984); and SEWRPC.

PHASE I AND II CENTRAL PUBLIC WORKS
FACILITY CONSTRUCTION COST ESTIMATE ANALYSIS

Table 22 provides a cost estimate analysis for the construction of a new central public works facility in the City of New Berlin as defined by the building and site development program presented in Chapter IV. The costs are expressed in 1985 dollars. Since it is currently uncertain whether the City will institute municipal solid waste collection in residential areas, two separate cost estimate analyses were prepared and illustrated in Table 22--one assuming a central public works facility with provision for municipal solid waste collection facilities, and one assuming a central public works facility without provision for municipal solid waste collection facilities. The ultimate decision regarding whether or not the City will have municipal solid waste collection services is one of local policy and beyond the scope of this study. However, good public administration would dictate that both alternatives, relative to their impact upon programming for the central public works facility, be considered.

It is important for the City to establish a realistic budget for the project if it is to be undertaken. Should the cost estimate result in a total budget amount which is larger than the extent of funds that can reasonably be expected to be made available, or that the City is willing to pay, then the quality of construction or the scope of the project must be reduced. Cost factors which were addressed in preparing the building construction cost estimate include building costs, fixed equipment costs, total construction costs, site acquisition and/or demolition costs, professional fees, contingencies, movable equipment costs, administration costs to the City, and the total budget required by the City to complete the project. Each of these factors is defined below.

Building Costs
Building costs include all costs of construction within five feet of the building line, items required by codes, and items normally found in buildings regardless of building type.

Fixed Equipment
Fixed equipment costs include the costs of all equipment items which may be installed before completion of the building and which are a part of the construction contract. Movable equipment would include special equipment such as chairs, tables, and desks.

Site Development
Site development costs include the costs of all work required on that portion of the building site which lies within the site boundary and up to five feet from the edge of the building, including grading, fencing, the construction of driveways and parking areas, utilities, landscape development, the placement of walks, site lighting, and sign placement, and the costs required to overcome any unusual foundation conditions.

Total Construction
The total construction cost represents the expected total budget for construction, including building costs, fixed equipment costs, and site development

Table 22

COST ESTIMATE ANALYSIS FOR THE CONSTRUCTION OF A NEW CENTRAL PUBLIC WORKS FACILITY FOR THE CITY OF NEW BERLIN BASED UPON 1985 DOLLARS

Item	Estimated Costs of Facilities					
	With Municipal Solid Waste Collection Facilities			Without Municipal Solid Waste Collection Facilities		
	Phase I	Phase II	Total	Phase I	Phase II	Total
A. Building Costs[a]	$2,618,175	$973,690	$3,591,865	$2,618,175	$ 279,055	$2,897,230
B. Fixed Equipment (6 percent of A)	157,090	58,420	215,510	157,090	16,745	173,835
C. Site Development (varies depending upon site selected, but a figure of 10 percent of A can be used)	261,820	97,370	359,190	261,820	27,900	289,720
D. Total Construction Cost (A + B + C)	$3,037,085	$1,129,480	$4,166,565	$3,037,085	$ 323,700	$3,360,785
E. Site Acquisition/Demolition (varies depending upon the site selected)	$ --	$ --	$ --	$ --	$ --	$ --
F. Professional Fees (architects, engineers, etc.--8 percent of D)	242,970	90,355	333,325	244,970	25,895	268,865
G. Contingencies (10 percent of D)	303,710	112,950	416,660	303,710	32,370	336,080
H. Movable Equipment (6 percent of D)	182,225	67,765	249,990	182,225	19,425	201,650
I. Administrative Costs to the City (2 percent of D)	60,740	22,590	83,330	60,740	6,480	67,220
J. Total Building Budget Recommended[b] (D + F + G + H + I)	$3,826,730	$1,423,140	$5,249,870	$3,826,730	$407,870	$4,234,600

[a]Using median costs as of January 1, 1985, as presented in Table 21 and building space needs as defined in this report.

[b]Excluding site acquisition/demolition costs and cost associated with extending public sanitary sewer or water to the site.

Source: SEWRPC.

costs. This figure should approximate the base bid of the building contract documents.

Site Acquisition and Demolition

The site acquisition and demolition cost represents the amount to be budgeted for acquisition and demolition of any existing structures on the site. These costs have not been included in Table 22, since they are highly dependent upon the site selected and the negotiated purchase price.

Professional Fees

Professional fees include the costs of legal, architectural, landscape architecture, engineering, and land surveying services.

Contingencies

The contingency represents a percentage of the total construction reserve to meet unforeseen expenses.

Movable Equipment

Movable equipment includes special equipment, chairs, tables, desks, and other furniture as needed.

Administrative Cost to the City

Administrative costs include costs for which the City is responsible during the planning and building process, including insurance costs and the cost of city staff personnel time.

Total Budget

The total budget represents the amount required to completely construct a ready-to-occupy central public works facility. This figure does not include any financing costs, any site acquisition and/or demolition costs, or the costs of municipal service extensions to the site.

The building budget was determined to approximate $3,826,730 for Phase I and $1,423,140 for Phase II construction, if the facility is to include provision for municipal solid waste collection facilities. The building budget was determined to approximate $3,826,730 for Phase I and $407,870 for Phase II construction, if the facility does not include provision for municipal solid waste collection facilities. All cost figures shown are expressed in 1985 constant dollar amounts. These costs are based upon the spatial requirements for the central public works facility as defined in the building program outlined and detailed in Chapter IV; the building costs per square foot for recently constructed public works facilities and similar building types within the Midwest; and the cost estimate analysis presented in Table 22.

Because of the constantly changing costs of labor and materials, and because of effects of competitive bidding, the statements of probable construction costs for the facilities cannot be guaranteed. In addition, the building design and types of construction material selected will be significant in determining the final construction costs. It should be understood that the costs outlined herein are based upon the median per-square-foot costs reported in the January 1, 1985 construction market and represent, at best, estimates which may be expected to change once the building has been designed and the types of construction materials selected.

(This page intentionally left blank)

Chapter VIII

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

INTRODUCTION

By letter dated June 2, 1986, the City of New Berlin requested that the staff of the Southeastern Wisconsin Regional Planning Commission assist the City in the conduct of a study to determine the best location for, and configuration of, a new central public works facility to serve the City. The study was to include: 1) an inventory of the current central public works-related facility and of major pieces of public works equipment to be housed at that facility; 2) the development of locational and site design criteria for a new facility; 3) the development of a central public works facility building and site development program; 4) the conduct of alternative central public works facility location and site evaluations; 5) the development of a central public works facility plan for the recommended site; and 6) the preparation of a cost estimate for the construction of the central public works facility. The study area considered was the City of New Berlin.

The study was necessitated by the need of the City to serve an expanded urban area, as well as an increase in population, by the years 2000 and 2010. The City of New Berlin currently houses its central public works facility--Street Department and Water and Sewer Department--on an eight-acre site located on the north side of W. National Avenue between Observatory Road and Civic Drive. The Street Department services and maintains all streets for which the City of New Berlin is responsible. In addition, the Street Department services and maintains all city-owned drainage and stormwater-related facilities. The Water and Sewer Department services and maintains the city-owned public water supply and sanitary sewer systems. The eight-acre National Avenue site and 25,800-square-foot buildings are of an inadequate size to accommodate present, much less future, facility needs of the City with respect to both the Street Department and Water and Sewer Department. This is due, in part, to the inadequacy of the site for future expansion to accommodate additional building space unless adjacent public parks lands are designated for facility expansion. Adequate storage space is not available at the National Avenue facility to properly house all the public works-related equipment currently used by the two departments. The existing public works site and its associated buildings can, however, provide adequate space to house the Water and Sewer Department facilities and equipment. Indeed, if the Street Department equipment were housed elsewhere, the existing National Avenue site should be able to accommodate both Park Department and Water and Sewer Department spatial needs to the year 2010. This would indicate a need to find another site in the City--properly located--to accommodate the existing and probable future spatial needs of the Street Department, as well as the needs of any additional public works services which may be assumed by the City--such as municipal solid waste collection and transportation. Specific spatial allocations relating to the existing National Avenue site are presented in Chapter II.

The size and configuration of the central public works facility is a function of the resident population to be served and of the type and amount of public works facilities to be maintained. Therefore, to properly plan for a new cen-

tral public works facility, pertinent information is required about both the historic and probable future resident population levels of the community, about existing and probable future urban land uses, and about existing and probable future street mileage to be serviced and maintained. Data on the historic and probable future total resident population, total number of occupied housing units, number of persons per occupied housing unit within the City, on the existing and probable future land uses in the City, and on the existing and probable future length of streets to be serviced and maintained by the City are shown in Tables 1, 2, and 3, presented in Chapter I.

In 1986, the City of New Berlin Plan Commission completed and adopted a new land use and urban design plan for the year 2010 which, due to explicit public reaction requesting that the City attempt to discourage excessive population growth over the plan design period, selected a forecast resident population for the City in the year 2010 of 43,000 persons, an increase of 12,471 persons, or 41 percent over the 1980 resident population of 30,529 persons. In 1980, there were 9,350 occupied housing units in the City and this number is expected to increase to about 15,170 units by the year 2010, representing an increase of 5,820 units, or 62 percent. In 1980, the average household size in the City was 3.26 persons. In the year 2010, the average household size in the City is expected to decline to 2.77 persons, representing a reduction of about 15 percent.

Overall, the various urban land uses in the City may be expected to increase from 7,923 acres in 1980 to 11,969 acres in the year 2010, representing a total increase of 4,046 acres of urban land uses, or about 51 percent over the 1980 figure. In the urban land use categories, residential land uses are expected to increase from 6,291 acres in 1980 to 8,851 acres in the year 2010, representing an increase of 2,561 acres during this period, or 63 percent of the total urban land use increase. The total number of miles of streets to be serviced and maintained by the City may be expected to increase from about 164 miles in 1980 to 242 miles in the year 2010, representing an increase of about 78 miles, or almost 48 percent. The total number of vehicles and related equipment necessary to service these additional streets is expected to increase from 65 in 1986 to 110 by the year 2010, representing an increase of 45 vehicles, or 69 percent. A complete list of additional equipment needed to meet this demand is presented in Table 6 of Chapter II.

These forecasts were used as a basis for the conduct of the study and are important in the architectural programming process. The determination of current, as well as anticipated, site and building space needs required the careful consideration of such forecasts.

SOLID WASTE DISPOSAL CONSIDERATIONS

The growing per capita generation of solid wastes and the heightened public awareness of the need to process and dispose of those wastes in an environmentally sound manner has resulted in solid waste management becoming an increasingly important issue of concern to elected officials at the state, county, and local levels of government. It is currently estimated that the total amount of residential solid waste generated in the greater Milwaukee area

totals about 2.6 pounds per person per day. It is forecast that this amount will increase to about 3.5 pounds per person per day by the year 2010, representing an increase of about 0.9 pound, or about 35 percent over the 25-year planning period.

Proper long-range planning can help to minimize the costs associated with the management of these solid wastes, as well as assure protection of the overall quality of the environment. This is especially important in the City of New Berlin because of the large quantitites of wastes generated and the City's current dependence upon private waste disposal companies for the collection and ultimate disposal of residence-generated solid waste. Good public administration would dictate that, in the building and site progarmming of a new central public works facility to serve the City of New Berlin through the year 2010, the possibility of municipal solid waste collection, transport, and disposal--at least for residential areas of the City--be considered and provided.

In addition, because of changing economic conditions and the relative value of materials commonly found in solid wastes, and owing to the increasing costs of disposal of such wastes and limited landfill capacities, processing to recover certain elements of the waste stream and reduce the bulk and overall volume of the solid waste materials may be expected to become more viable over time. Additional management steps which can be considered in response to this probability are source reduction, source separation, storage, processing and treatment, and resource recovery. Several of these steps, if eventually initiated by the City, have important implications for the building and site programming of the new central public works facility.

It is estimated that the annual average number of tons of residential solid waste generated by City of New Berlin residents was 16,800 in 1985 and is expected to increase to about 27,500 tons by the year 2010, representing an increase of about 10,700 tons, or 64 percent. If public collection and disposal of residential solid wastes are initiated within the City, the City would require 13 solid waste collection trucks (12 primary vehicles and one secondary back-up vehicle), two solid waste foremen cars, and one solid waste superintendent car, all to be housed at a properly located central public works facility site in the year 2010.

DEVELOPMENT OF CENTRAL PUBLIC WORKS FACILITY LOCATIONAL AND SITE DESIGN CRITERIA

In order to properly locate a site and design a site plan for a central public works facility, spatial, locational, and site planning design criteria of a high level of specificity must be established. Taken together, these criteria define the characteristics which the central public works facility should possess in order for the site to properly perform its intended functions. These criteria can then be applied to identify and to assist in evaluating alternative sites for the central public works facility. In Chapter III, the necessary criteria are presented, including criteria related to site location, environmental protection, functional area requirements of the site, user motor vehicle characteristics, automobile parking facility design, easements, stormwater drainage and erosion/sedimentation control, and the general landscaping of the site.

ARCHITECTURAL PROGRAMMING OF THE CENTRAL PUBLIC WORKS FACILITY

Architectural programming is defined as the process leading to the identification of a specific architectural design problem and the determination of the spatial requirements to be met in the solution to that problem. Architectural programming for the needs and spatial requirements of a new central public works facility for the City of New Berlin constitutes, in effect, problem definition; while the ultimate architectural design of the building constitutes the solution to the defined problem. Since it is necessary to know the spatial needs and requirements of the City of New Berlin Public Works Department in order to select a site which will meet these needs, a building program was formulated and presented in Chapter IV. The program is based, in part, upon the locational and site design criteria set forth in Chapter III, and the equipment needs analysis presented in Chapter II.

The architectural building program must identify the functions which the new facility is intended to house. Accordingly, Chapter IV presents the space requirements for the facility as a whole, as well as for each of the principal functional areas. The major functional areas of the central public works facility are defined as public works administration, public works vehicle and material storage, street salt storage, public works vehicle maintenance, solid waste facility, and outdoor and site-related functional spaces, which include off-street automobile and vehicle parking, waste processing facility waste separation and recycling collection facilities, material storage, vehicle queueing, circulation, landscaping, and required setbacks. One of the important functions of an architectural building program is to provide a consolidated listing of all the building facility requirements believed necessary to serve the forecast spatial needs to specified facility design years, in this case, the years 2000 and 2010. The building program presented in Chapter IV consists of two phases of construction. Phase I construction would accommodate the year 2000 spatial needs of a new public works facility. Phase II construction would accommodate the additional space needs for the design year 2010. Phase I--or year 2000--would require a total of 69,010 square feet of building area located on a minimum site size of about 15.4 acres of land. Phase II--or year 2010--would require an additional 25,375 square feet of building area and an additional minimum of 2.2 acres of land. The total building space and site size requirements to accommodate the completed facility for year 2010 needs would be 94,385 square feet and a site area of 17.6 acres, respectively.

THE ALTERNATIVE CENTRAL PUBLIC WORKS FACILITY SITE LOCATIONS CONSIDERED

Six alternative sites were initially considered and subsequently evaluated for the location of a new central public works facility, as illustrated on Map 2 in Chapter V:

Site 1--A 37.9-acre site located on the northeast corner of the intersection of Coffee Road and Calhoun Road in U.S. Public Land Survey Section 15.

Site 2--A 37.6-acre site located on the northwest corner of the intersection of Coffee Road and Calhoun Road in U.S. Public Land Survey Section 16.

Site 3--A 71.4-acre site located on the southeast corner of the intersection of Coffee Road and Calhoun Road in U.S. Public Land Survey Section 15.

Site 4--A 64.8-acre site located about 700 feet southwest of the intersection of Calhoun Road and National Avenue on the northwest side of National Avenue in U. S. Public Land Survey Section 21.

Site 5--A 29.4-acre site located on the west side of Moorland Road approximately 300 feet south of Ryerson Road in U. S. Public Land Survey Section 10.

Site 6--A 6.6-acre site located on the east side of Sunny Slope Road near the intersection of Cleveland Avenue and Sunny Slope Road and occupied by a former elementary school building.

A COMPARATIVE NONECONOMIC CENTRAL PUBLIC WORKS FACILITY SITE EVALUATION AND THE RECOMMENDED SITE

The most important noneconomic criteria which must be considered for the proper siting of the central public works facility are proximity to both streets and residential areas serviced by public works and municipal solid waste collection equipment, traffic conflicts, compatibility with neighboring land uses, man-made and natural barriers, site configuration and expansion capabilities, environmental corridor protection, conformance with the adopted city land use and urban design plan, adequate provision of utilities such as sanitary sewer and water, soil characteristics and compatibility, site slope compatibility with use, and zoning.

A technique was developed to facilitate an objective comparative evaluation of the suitability of the six sites. This technique was based upon an identification of the relative importance of the various site evaluation measures in the proper planning and siting of a central transfer site. These measures were discussed in Chapter V and listed in rank order of importance on Table 17, with the rank order being assigned a numeric value from one to four--with four representing the highest level of importance. The relative values of the rank ordered measures were then normalized so that the total of the numeric values would equal 10. The six alternative sites were then comparatively evaluated on the basis of each of the site evaluation measures listed and scored accordingly, based upon the site inventory and analysis data presented in Chapter V. The scoring was based upon the degree to which each site was deemed to meet each site evaluation measure in relation to the other sites considered. A score of four on a site evaluation measure indicated that the site is excellent for that particular element being considered; three, good; two, fair; one, poor; and zero, unsatisfactory. The score of each site evaluation measure was then multiplied by its normalization factor--from Table 17--in order to attain its normalized value.

Based upon the summation of the normalized scores for all the site evaluation measures, an overall score was assigned to the alternative sites. The site evaluation measure, its normalizing factor, and the score and normalized score for each alternative site considered were set forth in Table 18 in Chapter V. The site with the highest total normalized score was deemed the most suitable

site for a central public works facility, based upon the site evaluation measures presented. A rank order listing of all alternative sites considered, based upon this evaluation, is shown in Table 19 of Chapter V. The site which scored the highest and which is the recommended site for the facility is Site 1 located on the northeast corner of the intersection of Coffee Road and Calhoun Road in U. S. Public Land Survey Section 15.

CENTRAL PUBLIC WORKS FACILITY SITE PLAN DESIGN

Two detailed alternative site plan designs for recommended Site 1 were developed based on an analysis of the various spatially related functions of the central public works facility and its site. In addition, the predevelopment conditions of the site were analyzed. Figures 34 and 35 illustrate the two alternative central public works facility site plans.

CENTRAL PUBLIC WORKS FACILITY CONSTRUCTION COST ESTIMATE ANALYSIS

Based upon data contained in the publication, Means Building Construction Costs Data 1985 published by Robert Snow Means Company, Inc., and the Means Data Bank of Construction Costs adjusted to January 1, 1985, for the greater Milwaukee area, the total cost of the facility proposed, with municipal solid waste collection facilities, in 1985 dollars would be:

Phase I.....	$3,826,730
Phase II.....	1,423,140
Total	$5,249,870

The cost of the facility proposed without municipal solid waste collection facilities, in 1985 dollars, would be:

Phase I.....	$3,826,730
Phase II.....	407,870
Total	$4,234,600

These costs do not include site acquisition/demolition costs and costs associated with extending public sanitary sewer or water to the site. Because of the constantly changing market costs of labor and materials, and because of the competitive bidding, the statements of probable construction cost for the facilities cannot be guaranteed. In addition, the building design and construction material selection will be significant in determining the final construction costs.

APPENDICES

(This page intentionally left blank)

APPENDIX A

ANALYSIS OF TWO ADDITIONAL SITES

(This page intentionally left blank)

COPY

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

916 N. EAST AVENUE • P.O. BOX 1607 • WAUKESHA, WISCONSIN 53187-1607 • TELEPHONE (414) 547-6721

Serving the Counties of: KENOSHA
MILWAUKEE
OZAUKEE
RACINE
WALWORTH
WASHINGTON
WAUKESHA

April 1, 1987

Mr. Ralph A. Becker, P.E.
Director of Public Works
City of New Berlin
City Hall
3805 S. Casper Drive
New Berlin, Wisconsin 53151-5510

Dear Mr. Becker:

Pursuant to your letter request of January 28, 1987, as supplemented by your letter of March 20, 1987, the Commission staff has now completed its analysis of two additional potential sites for the location of a new central public works facility for the City of New Berlin. These two additional sites have been designated Sites 7 and 8. As in the case of the Commission staff's analysis of the six earlier identified potential sites, as documented in the preliminary draft of SEWRPC Memorandum Report No. 18, entitled A Central Public Works Facility Building Program, Site Location Analysis, and Site Development Plan, the Commission staff evaluated the two additional sites on the basis of size, location, proximity to areas serviced by street maintenance and municipal solid waste collection equipment, traffic conflicts, compatibility with neighboring land uses, man-made and natural barriers, site configuration and expansion capabilities, environmental corridor protection, conformance with the adopted City land use and urban design plan, availability of utility service including sanitary sewer and water, soil characteristics, and zoning. The following presents the findings of the analysis:

ALTERNATIVE SITE 7

Site Size, Location, and Proximity to Streets, and Residential Areas Served

The site is approximately 69 acres in area--excluding the land area occupied by the new City Hall--and is located in the south one-half of the southwest one-quarter of U. S. Public Land Survey Section 15, east of and abutting Calhoun Road. The site is rated as good with respect to proximity to streets and land uses to be served.

Traffic Conflicts

Primary vehicular access to the site is provided by Calhoun Road and secondary access to the site is provided by Casper Road. Calhoun Road is a local arterial street and Casper Road functions as a collector street. In 1985, the average weekday traffic volume on Calhoun Road south of Coffee Road was 5,150 vehicles. Good vehicular access can be provided the site from

Calhoun Road with some potential traffic conflicts occurring due to vehicular left-turn movements to either enter the site from Calhoun Road or to exit the site north or southbound onto Calhoun Road.

Compatibility With Neighboring Land Uses

The site is contiguous to the following land uses: north--vacant lands; south--vacant lands and a City park; east--the new City Hall; and, west--vacant lands. Compatibility with neighboring land uses is, therefore, good.

Man-Made and Natural Barriers

No significant man-made or natural barriers are located near the site to impede access to other areas of the City. Therefore, the site is rated as excellent for this characteristic.

Site Configuration and Expansion Capabilities

The site is rectangular in shape and, since the site is about 69 acres in area, provides adequate area for future facility expansion.

Environmental Corridor Protection

About 18 acres, or about 26 percent of the total site area, are comprised of secondary environmental corridors. There are no primary environmental corridors or isolated natural areas identified at the site. The site is thus rated as good with respect to this characteristic.

Conformance With the Adopted City Land Use and Urban Design Plan

The adopted City land use and urban design plan indicates that Site 7 continue to be developed as a City park with an attendant trail located contiguous to the area occupied by the secondary environmental corridor. In addition, the adopted park and open space plan documented in SEWRPC Community Assistance Planning Report No. 66 entitled A Park and Open Space Plan for the City of New Berlin recommends that this site be maintained for outdoor recreation use. Therefore, the construction of a public works facility at this site would be in conflict with adopted City plans for this area.

Adequate Provision of Utilities (Sanitary Sewer and Water)

Based upon City of New Berlin Engineering Department analysis provided in your letter dated March 20, 1987, approximately 5,950 total linear feet of sanitary sewer would have to be extended to serve this site. In addition, Site 7 would also require the extension of approximately 5,950 total linear feet of water main. The site is thus rated as poor with respect to this characteristic.

Soil Characteristics and Compatibility

Soil types found at Site 7 include the Tichigan silt loam (7 acres, or 10.1 percent of the total site area); Ehler silt loam (6 acres, or 8.7 percent of the total site area); Bone silty clay loam--thin surface variant (13 acres,

or 18.8 percent of the total site area); Ozaukee silt loam (33 acres, or 47.9 percent of the total site area); and the Mequon silt loam (10 acres, or 14.5 percent of the total site area). Site 7 has about 36 acres, or about 52 percent of its total area, covered by soils which exhibit severe characteristics and limitations for a light industrial use such as the construction of a public works facility. The site is accordingly rated as fair with respect to this characteristic.

Site Slope Compatibility With Use

Alternative Site 7 has about 36 acres, or about 52 percent of its total area, with slopes of from 0 to 3 percent and about 33 acres, or 48 percent of the site, with slopes from 4 to 6 percent. Accordingly, the site is rated as excellent with respect to site slope compatibility.

Zoning

Site 7 is currently zoned in the B-3 General Business District (southernmost approximately 660 feet), the R-2 Residential District, and the C-1 Conservancy District. Public utility facilities, such as the central public works facility, are permitted as conditional uses within these districts. However, due to the dissimilarity of the central public works facility to the uses permitted in these three districts, the site is rated as fair with respect to zoning.

ALTERNATIVE SITE 8

The site is approximately 7.8 acres in area and is located in the south one-half of the northwest one-quarter of U. S. Public Land Survey Section 22 at the northeast corner of the intersection of Observatory Road and W. National Avenue. This site is inadequate in size to accommodate the central public works facility spatial needs for a minimum site area of about 18 acres as outlined in the building program presented in Chapter IV of the preliminary draft of SEWRPC Memorandum Report No. 18.

CONCLUSIONS

Based upon the findings of the foregoing analysis as well as upon the findings of the analyses presented in the preliminary draft of SEWRPC Memorandum Report No. 18, the Commission staff has prepared the following amended "Rank Order Listing of the Alternative Central Public Works Facility Sites Based Upon the Noneconomic Site Evaluation:"

Rank Order	Normalized Score	Alternative Site
1	34.86	1
2	27.75	3
3	27.73	7
4	26.28	2
5	25.79	4
6	21.09	5

Please note that Alternative Site 1 still scores the highest of all eight sites considered to date.

We trust that the foregoing analyses and findings are fully responsive to your request. Should you have any further questions regarding this matter, please do not hesitate to contact us.

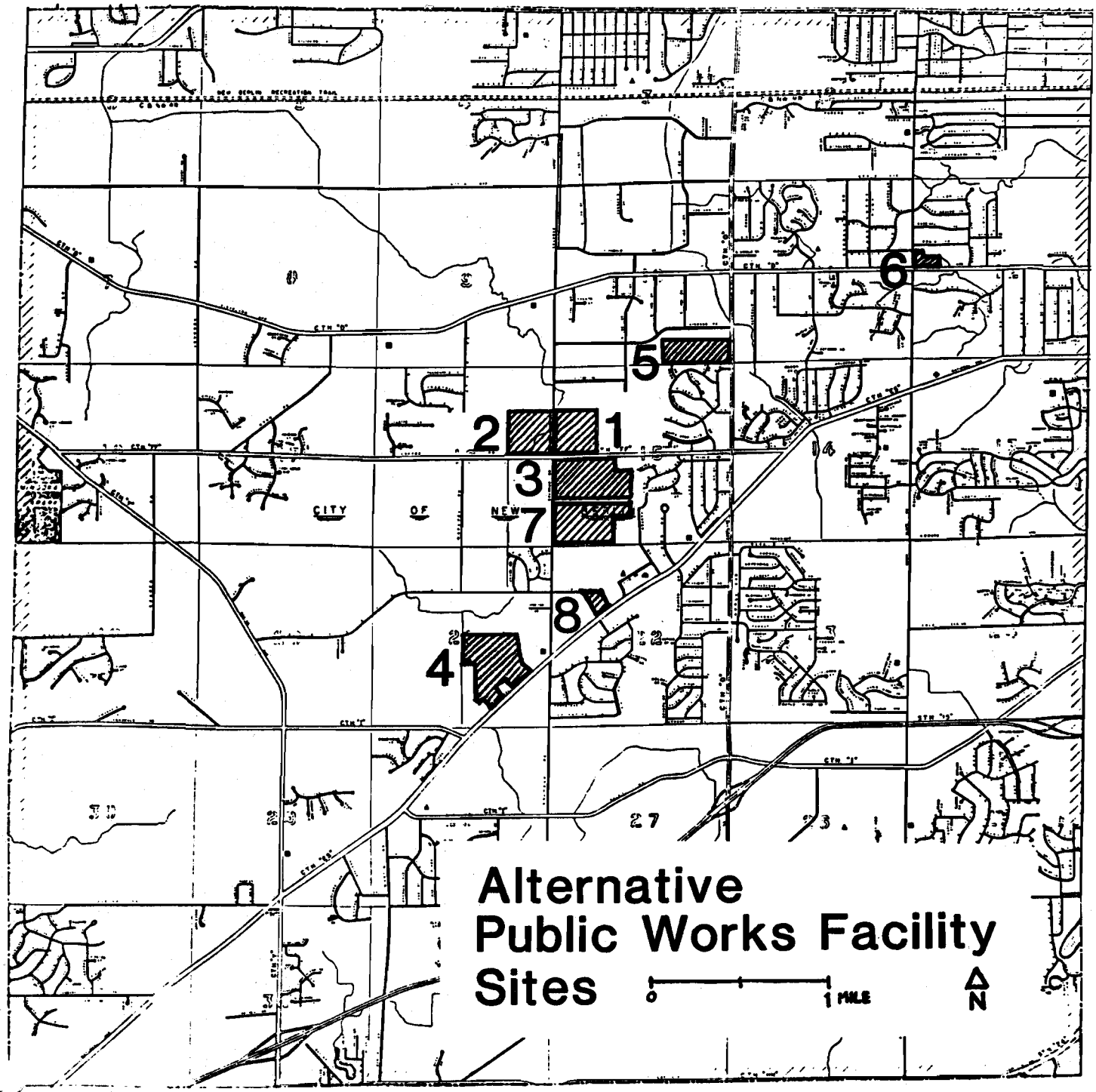
Sincerely,

Kurt W. Bauer
Executive Director

KWB/rj
LU47/D

Map A-1

GENERAL ALTERNATIVE SITE LOCATIONS FOR THE
CENTRAL PUBLIC WORKS FACILITY FOR THE CITY OF NEW BERLIN



Source: SEWRPC.

(This page intentionally left blank)

APPENDIX B

DETAILED COST ESTIMATE ANALYSIS TO EXTEND PUBLIC SANITARY SEWER AND WATER SUPPLY SYSTEMS TO THE ALTERNATIVE SITES

Source: City of New Berlin Engineering Department.

ALTERNATIVE SITE #1

In general, to provide sanitary sewer service, a 1,900-foot extension in the future 166th Street right-of-way would be required. Also, about 1,800± feet of sanitary sewer would be required in the Coffee Road right-of-way.

Estimated Sanitary Sewer Cost:

In 166th Street 1,900' 15" sanitary sewer @ $45/linear ft.	=	$ 85,500
5 Manholes @ $1,200/each	=	6,000
	=	$ 91,500
+ 15% Engineering and Administration	=	13,725
	=	$105,225
In Coffee Road 1,800' 12" sanitary sewer @ $40/linear ft.	=	$ 72,000
5 Manholes @ $1,200/each	=	6,000
	=	$ 78,000
+ 15% Engineering and Administration	=	11,700
	=	$ 89,700
Total Sanitary Sewer Extension Cost	=	$194,925

The nearest watermain is the 16" main located in the Victor Road and Calhoun Road rights-of-way. There is also an 8" watermain in 166th Street right-of-way just south of Victor Road. To reach this site via 166th Street and Coffee Road would require:

Estimated Watermain Cost:

In 166th Street 1,900' 12' Watermain @ $25/linear ft.	=	$ 47,500
5 hydrants @ $1,200/each	=	6,000
3 valves @ $500/each	=	1,500
	=	$ 55,000
+ 15% Engineering and Administration	=	8,250
	=	$ 63,250
In Coffee Road 1,800' 12" Watermain @ $30/linear ft.	=	$ 54,000
5 hydrants @ $1,200/each	=	6,000
3 valves @ $800/each	=	2,400
	=	$ 62,400
+ 15% Engineering and Administration	=	9,360
	=	$ 71,760
Total Watermain Cost	=	$135,010
Total Sanitary Sewer and Watermain Cost	=	$329,935

ALTERNATIVE SITE #2

Sanitary sewer extension costs shown for this site are based upon the premise that the sewage in this area will ultimately flow to the Brookfield wastewater treatment plant. The closest existing sanitary sewer is presently at the end of the 166th Street right-of-way south of Victor Road. Upon development of the last phase of the Moorland Industrial Park, this sewer will be brought 1,900 feet south to the Coffee Road right-of-way. At that time, an additional 2,600 feet of sanitary sewer in the Coffee Road right-of-way would be required to reach the site.

Estimated Sanitary Sewer Cost:

In 166th Street 1,900' 15" sanitary sewer @ $45/linear ft.	=	$ 85,500
5 Manholes @ $1,200/each	=	6,000
	=	$ 91,500
In Coffee Road 2,600' 12" sanitary sewer @ $40/linear ft.	=	$104,000
7 Manholes @ $1,200/each	=	8,400
	=	$203,900
+ 15% Engineering and Administration	=	30,735
Total Sanitary Sewer Extension Cost	=	$234,635

The nearest watermain is in Calhoun Road and Victor Road rights-of-way. This is a 16" main and would require a 2,200-foot extension.

Estimated Watermain Cost:

2,200' of Watermain @ $45/linear ft.	=	$ 99,000
6 hydrants @ $1,200/each	=	7,200
2 16" valves @ $1,500/each	=	3,000
	=	$109,200
+ 15% Engineering and Administration	=	16,380
Total Watermain Cost	=	$125,580

Total Sanitary Sewer and Watermain Cost	=	$361,215

ALTERNATIVE SITE #3

Cost estimates to provide sewer to the Milwaukee Metropolitan Sewerage District and watermain will vary depending on which 20 acres is desired of the 75-acre parcel. In general, to provide sanitary sewer service a 1,900-foot extension in the future 166th Street right-of-way would be required. Also, about 1,800± feet of sanitary sewer would be required in the Coffee Road right-of-way.

Estimated Sanitary Sewer Cost:

In 166th Street 1,900' 15" sanitary sewer @ $45/linear ft.	=	$ 85,500
5 Manholes @ $1,200/each	=	6,000
	=	$ 91,500
+ 15% Engineering and Administration	=	13,725
	=	$105,225
In Coffee Road 1,800' 12" sanitary sewer @ $40/linear ft.	=	$ 72,000
5 Manholes @ $1,200/each	=	6,000
	=	$ 78,000
+ 15% Engineering and Administration	=	11,700
	=	$ 89,700
Total Sanitary Sewer Extension Cost	=	$194,925

The nearest watermain is the 16" main located in the Victor Road and Calhoun Road rights-of-way. There is also an 8" watermain in the 166th Street right-of-way just south of Victor Road. To reach this site via 166th Street and Coffee Road would require:

Estimated Watermain Cost:

In 166th Street 1,900' 12' Watermain @ $25/linear ft.	=	$ 47,500
5 hydrants @ $1,200/each	=	6,000
3 valves @ $500/each	=	1,500
	=	$ 55,000
+ 15% Engineering and Administration	=	8,250
	=	$ 63,250
In Coffee Road 1,800' 12" Watermain @ $30/linear ft.	=	$ 54,000
5 hydrants @ $1,200/each	=	6,000
3 valves @ $800/each	=	2,400
	=	$ 62,400
+ 15% Engineering and Administration	=	9,360
	=	$ 71,760
Total Watermain Cost	=	$135,010
Total Sanitary Sewer and Watermain Cost	=	$329,935

Alternative Site #4

The nearest sanitary sewer and watermain is in the W. National Avenue right-of-way at the existing City garage.

Estimated Sanitary Sewer Cost:

4,750 lineal feet of 4" sanitary sewer force main @ $22/lineal ft.	=	$104,500
A small pumping station @ $20,000	=	20,000
	=	$124,500
+ 15% Engineering and Administation	=	$ 18,675
Total Sanitary Sewer Cost	=	$143,175

Estimated Watermain Cost:

4,750 lineal ft. of 16" Watermain @ $45/lineal ft.	=	$213,750
5 16" GV @ $1,500/each	=	7,500
12 hydrants @ $1,200/each	=	14,400
	=	$225,650
+ 15% Engineering and Administration	=	33,847
Total Watermain Cost	=	$259,497

Total Sanitary Sewer and Watermain Cost = $402,672

Alternative Site #5

This site already has both sanitary sewer and watermain available to it.

Alternative Site #6

This site already has both sanitary sewer and watermain available to it.